Appendix B – Dredge Material Characterisation

- **Marine Institute Correspondence**
- **Aquafact – Sediment Characterisation Report (July 2014)**

Kenny James

From: Kenny James
Sent: 20 March 2014 17:22
To: 'Margot Cronin'
Cc: Jameson Aedan
Subject: RE: Rosslare Europort - Maintenance Dredging
Attachments: HS 31_14 Dredge Area Sketch - 20140320.pdf

Tracking:

Recipient	Delivery
'Margot Cronin'	
Jameson Aedan	Delivered: 20/03/2014 17:22

Margot

Please find attached a sketch which outlines the proposed dredge area (shaded green) based on latest hydrographic survey. The shaded area extends to approximately 51,500m^2.

If you have any further queries, please let me know.

Regards

James

From: Margot Cronin [mailto:margot.cronin@marine.ie]
Sent: 20 March 2014 16:24
To: Kenny James
Subject: RE: Rosslare Europort - Maintenance Dredging

James,

Thanks for prompt response. I'd like you to outline on the drawing where you expect the dredge area to be, including side slopes please, just to be sure I have it right.

Best regards,
Margot

From: Kenny James [mailto:James.Kenny@irishrail.ie]
Sent: 20 March 2014 11:50
To: Margot Cronin
Cc: Jameson Aedan
Subject: RE: Rosslare Europort - Maintenance Dredging

Margot

Thank you for taking my call this morning.

As discussed, please find attached the most recent hydrographic survey of the area to be dredged at Rosslare Europort. I have also attached a photograph of the area to provide an indication of the scale of the problem.

As you can see from the survey drawing there has been significant accumulation of sand at the end of the Northeast Breakwater and at Berth No.4. We currently estimate that removal of between 80,000-100,000m3 of material is required to provide the charted depth of -7.2m CD in the Approach Channel (outlined in blue on the drawing) and at Berth No.4. To provide this charted depth will be necessary to dredge in the area to south of the channel, outside

the breakwater. The extent of the dredging in this area is likely to be dictated by the available budget but it won't extend more than 50-75m beyond the channel extent.

Can you please specify the sampling locations as discussed?

If you have any queries or you require further information, please do not hesitate to contact me.

Regards,

James Kenny
Design & Construction, New Works
Iarnród Éireann Infrastructure, Engineering & New Works Building, CIÉ Works, Inchicore, Dublin 8.
☎: +353 87 2061823 ✉: james.kenny@irishrail.ie 🌐: www.irishrail.ie

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From: Kenny James
Sent: 13 March 2014 10:21
To: Margot Cronin (margot.cronin@marine.ie)
Cc: Jameson Aedan
Subject: Rosslare Europort - Maintenance Dredging

Margot

We are currently preparing a foreshore application for maintenance dredging works for Rosslare Europort and I was hoping to discuss the sediment sampling and testing requirements with you. I would appreciate it if you could give me a call on 087-2061823 at your earliest convenience.

Regards,

James Kenny
Design & Construction, New Works
Iarnród Éireann Infrastructure, Engineering & New Works Building, CIÉ Works, Inchicore, Dublin 8.
☎: +353 87 2061823 ✉: james.kenny@irishrail.ie 🌐: www.irishrail.ie

Rinville
Oranmore
Co Galway
Tel: +353 91 387200

James Kenny
Iarnrod Eireann
Rosslare Europort
Rosslare

27 March 2014

Dear James,

Details are given below of the recommended sampling and analysis plan to characterise sand which has built up recently in Rosslare Harbour. The sampling plan has been based on the drawing supplied by you last week, and on quantities to be dredged supplied of 80 000 - 100 000m^3. Positions are given below in WGS84.

1.0 Sample location and analyses required:

Sample No.	Longitude (° W)	Latitude (° N)	Depth	Parameters for analysis
1	-6.33782	52.25822	Surface	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
2	-6.33806	52.25681	Surface	1, 2, 3, 4a, 4b, 4c, 4f
3	-6.33939	52.25764	Surface	1, 2, 3, 4a, 4b, 4c, 4f
4	-6.33678	52.25623	Surface	1, 2, 3, 4a, 4b, 4c, 4d

Sample locations are shown on Figure 1 below.

Figure 1. Recommended locations for samples

2.0 Parameter Code:

1. Visual inspection, to include colour, texture, odour, presence of animals etc
2. Water content, density (taking into account sample collection and handling)
3. Granulometry including % gravel (> 2mm fraction), % sand (< 2mm fraction) and % mud (< 63μm fraction).
4. The following determinants in the sand-mud (< 2mm) fraction * :
   a) total organic carbon
   b) carbonate
   c) mercury, arsenic, cadmium, copper, lead, zinc, chromium, nickel, lithium, aluminium.
   d) organochlorines including γ-HCH (Lindane) and PCBs (to be reported as the 7 individual CB congeners: 28, 52, 101, 118, 138, 153, and 180).
   e) total extractable hydrocarbons.
   f) tributyltin (TBT) and dibutyltin (DBT)
   g) Polycyclic aromatic hydrocarbons (PAH) - Acenaphthene, Acenaphthylene, Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene,

Flourene, Fluoranthene, Indeno 1,2,3 – cd pyrene, Naphthalene, Phenanthrene, Pyrene.

h) Toxicity tests (Microtox or whole sediment bioassay) using appropriate representative aquatic species. (This requirement will depend on the results of the chemical analyses.)

**where the gravel fraction (> 2mm) constitutes a significant part of the total sediment, this should be taken into account in the calculation of the concentrations.*

3.0 Important notes:

3.1 Details of the methodologies used must be furnished with the results. This should include sampling, sub sampling and analytical methods used for each determinant

3.2 Appropriate marine CRM are to be analysed during each batch of analyses and the results to be reported along with sample results.

3.3 The required detection limits for the various determinants are given below.

Contaminant	Concentration	Units (dry wt)
Mercury	0.05	mg kg^{-1}
Arsenic	1.0	mg kg^{-1}
Cadmium	0.1	mg kg^{-1}
Copper	5.0	mg kg^{-1}
Lead	5.0	mg kg^{-1}
Zinc	10	mg kg^{-1}
Chromium	5.0	mg kg^{-1}
Nickel	15	mg kg^{-1}
Total extractable hydrocarbons	10.0	mg kg^{-1}
TBT and DBT (not organotin)	0.01	mg kg^{-1}
PCB – individual congener	1.0	μg kg^{-1}
OCP – individual compound	1.0	μg kg^{-1}
PAH – individual compound	20	μg kg^{-1}

4.0 Reporting requirements

Reports should include the following information

4.1 Date of sampling

4.2 Location of samples in WGS84.

4.3 Treatment of samples and indication of sub sampling, compositing etc.

4.4 Tabulated geophysical and chemical test results

4.5 Completed excel spreadsheet for results

4.6 Summary method details

4.7 Method performance specifications: Limit of detection, Precision, Bias

4.8 Clear expression of units and indication of wet weight or dry weight basis

4.9 Blanks & in-house references to be run with each sample batch, and reported with sample results.

4.10 Appropriate Certified Reference Materials (CRM) to be run with each sample batch, and reported in full with sample results.

4.11 If determinant is not detected, report less than values, and indicate LoD/ LoQ used. Other quality assurance information (e.g. accreditation status)

If you need clarification on anything, please don't hesitate to contact me.

Best regards,

_____

Margot Cronin
Marine Environment Chemist

Rosslare Eurport
Sediment Characterisation
for
Foreshore Licence Application

Produced by

AQUAFACT International Services Ltd

On behalf of

Iarnród Éireann

July 2014

AQUAFACT INTERNATIONAL SERVICES ltd
12 KILKERRIN park
TUAM rd
GALWAY city
www.aquafact.ie

info@aquafact.ie

tel +353 (0) 91 756812
fax +353 (0) 91 756888

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1. Introduction

AQUAFACT was commissioned by Iarnród Éireann to carry out a sediment assessment of Rosslare Europort in terms of its physical and chemical properties in line with Cronin *et. al.* (2006) 'Guidelines for the assessment of dredge material for disposal in Irish waters'.

Fifteen sites were sampled for physical and chemical analyses. One of these 15 and an additional site were sampled for radiological analysis. The results from 6 of the stations are required for a Foreshore Licence application and the other sites were required as part of the monitoring programme for an existing Dumping at Sea (DaS) permit.

The Foreshore Licence is required as a result of unprecedented and substantial sediment deposition in the approach channel of Rosslare Europort during the winter storms of 2013/2014. This deposition has resulted in the closure of a number of berths. Approximately 85,000m^3 of sediment is planned to be removed and deposited in a near-by beach nourishment site.

This report details the findings of the physical and chemical analyses.

2. Materials & Methods

2.1. Sampling Procedure

To carry out the sediment sampling of Rosslare Europort, AQUAFACT sampled 16 sites within the port and surrounding area (see Figure 2.1). Station coordinates can be seen in Table 2.1 along with the analysis required at each station. Samples were retrieved using a 0.025m^2 van Veen grab.

All sampling took place on the 16th May 2014. AQUAFACT has in-house standard operational procedures for benthic sampling and these were followed for this project. Additionally, the recently published MESH report on "Recommended Standard methods and procedures" were adhered to.

The sediment samples were divided up for chemical analysis, physical analysis and radiological analysis (where required). All sampling jars were marked externally with date, station number, sample number and survey reference number and placed in a cooler box.

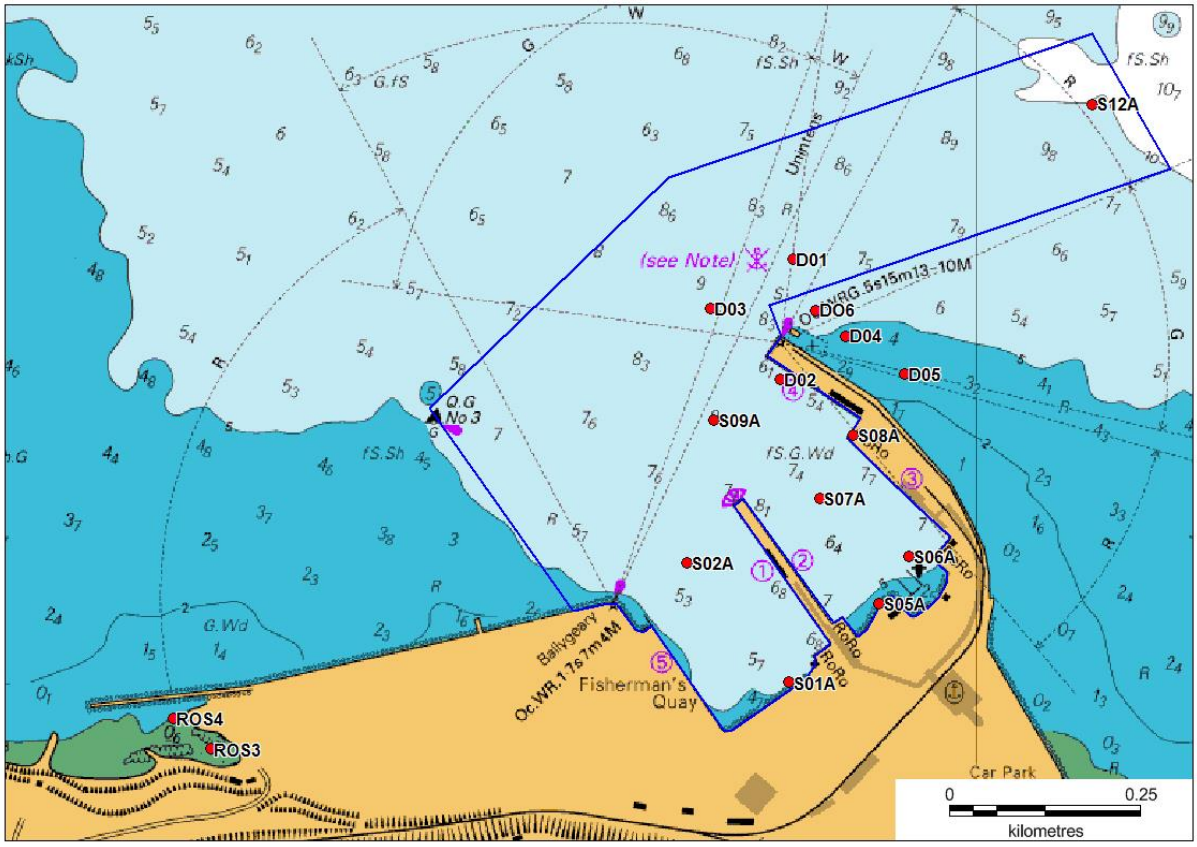

Figure 2.1: Location of the 16 sites sampled in Rosslare Europort on the 16th May 2014.

Table 2.1: Coordinates of all grab sampling stations.

Reference No.	Sample ID	Longitude	Latitude	Easting (ING)	Northing (ING)	Depth (m)*	Analysis
1	D01	-6.33782	52.25822	313482.2	113123.9	5.6	Physical/Chemical
2	D02	-6.33806	52.25681	313469.4	112966.7	-0.6	Physical/Chemical
3	D03	-6.33939	52.25764	313376.5	113056.9	8	Physical/Chemical
4	D04	-6.33681	52.25732	313553.5	113025.3	2	Physical/Chemical
5	D05	-6.33569	52.25687	313631.1	112977	1	Physical/Chemical, Radiological
6	S01A	-6.3379	52.25327	313489.4	112573.1	4	Physical/Chemical
7	S02A	-6.33983	52.25467	313354	112725.8	4.7	Physical/Chemical
8	S05A	-6.33618	52.25419	313604.5	112678.2	2	Physical/Chemical
9	S06A	-6.33561	52.25474	313642.2	112740.1	5.2	Physical/Chemical
10	S07A	-6.33731	52.25542	313524.2	112813.2	7.4	Physical/Chemical
11	S08A	-6.33667	52.25616	313566	112896.5	5.7	Physical/Chemical
12	S09A	-6.33933	52.25633	313383.9	112911.3	8.9	Physical/Chemical
13	S12A	-6.33211	52.26003	313867.4	113334.2	10	Physical/Chemical
14	ROS3	-6.34892	52.25249	312739	112469.1	-0.7	Physical/Chemical

Reference No.	Sample ID	Longitude	Latitude	Easting (ING)	Northing (ING)	Depth (m)*	Analysis
15	ROS4	-6.34964	52.25285	312688.9	112508	-0.5	Physical/Chemical
16	D06	-6.33739	52.25762	313,578	113,017	1	Radiological

* All depths relate to Chart Datum

2.2. Sample Processing

2.2.1. Physical Analyses

2.2.1.1. Particle Size Analysis (PSA)

AQUAFACT carried out the PSA analysis in-house using the following methodology:

1. Approximately 100g of dried sediment (previously washed in distilled water and dried) was weighed out and placed in a labelled 1L glass beaker to which 100ml of a 6 percent hydrogen peroxide solution was added. This was allowed to stand overnight in a fume hood.
2. The beaker was placed on a hot plate and heated gently. Small quantities of hydrogen peroxide were added to the beaker until there was no further reaction. This peroxide treatment removed any organic material from the sediment which can interfere with grain size determination.
3. The beaker was then emptied of sediment and rinsed into a 63µm sieve. This was then washed with distilled water to remove any residual hydrogen peroxide. The sample retained on the sieve was then carefully washed back into the glass beaker up to a volume of approximately 250ml of distilled water.
4. 10ml of sodium hexametaphosphate solution was added to the beaker and this solution was stirred for ten minutes and then allowed to stand overnight. This treatment helped to dissociate the clay particles from one another.
5. The beaker with the sediment and sodium hexametaphosphate solution was washed and rinsed into a 63µm sieve. The retained sample was carefully washed from the sieve into a labelled aluminium tray and placed in an oven for drying at 100ºC for 24 hours.
6. The dried sediment was then passed through a Wentworth series of analytical sieves (>8,000 to 63µm; single phi units). The weight of material retained in each sieve was weighed and recorded. The material which passed through the 63µm sieve was also weighed and the value added to the value measured in Point 5 (above).
7. The total silt/clay fraction was determined by subtracting all weighed fractions from the initial starting weight of sediment as the less than 63µm fraction was lost during the various washing stages.

8. The following range of particle sizes: <63µm, 63<125µm, 125<250µm, 250<500µm, 500<1000µm, 1000<2000µm, 2000<4000µm and 4000<8000µm were reported.

2.2.1.2. Moisture Content & Density

Moisture content was taken as the percentage weight difference between the wet and dried sediment. Sediment density was calculated by placing a fixed volume (100 ml) of sediment in a volumetric cylinder and weighing the contents.

2.2.2. Chemical Analysis

Once back in the lab, the sediments for organic carbon analysis were sent to ALS Labs in Loughrea, Co. Galway and all other sediment samples for the analysis of organics and contaminants were sent to the National Laboratory Service in Leeds.

The following methodologies were employed:

- Organic carbon analysis: Loss on Ignition at 450°C
- Hydrocarbons: UV- methanol digested, pentane xch, by UV fluorescence spectrometry
- Organotins: acetic acid/methanol extracted; derivatised; determined GCMS (SIM)
- Mercury: LE M Mercury CSEMP - microwave aqua regia digested, acidic SnCl2 reduced, determined by CV-AFS, samples are sieved to <63um.
- Aluminium: Open Vessel Hotplate HF digest, determined by ICPOES, samples are sieved to <63um.
- Metals: HF Digest Open Vessel Hotplate Digest, determined by ICPMS, samples are sieved to <63um
- PAH, PCBs and OCP: solvent extracted, determined by GCMS QQQ

Limits of detection can be seen in Table 2.2.

Table 2.2: Limits of Detection

Parameter	Unit	LOD
Hydrocarbons	mg/kg	0.05
Mercury	mg/kg	0.002
Aluminium	mg/kg	50
Arsenic	mg/kg	0.4
Cadmium	mg/kg	0.03
Chromium	mg/kg	3
Copper	mg/kg	1
Lead	mg/kg	3

Parameter	Unit	LOD
Lithium	mg/kg	0.1
Nickel	mg/kg	1
Zinc	mg/kg	5
OCP	µg/kg	1-2
PAH	µg/kg	2-30
PCBs	µg/kg	0.1
DBT/TBT	µg/kg	3

2.2.3. Radiological Analysis

Once back in the lab, all sediment samples for radiological analysis were sent to the Radiological Protection Institute of Ireland in Dublin. The samples were analysed using Gamma Spectroscopy (Complex).

3. Results

3.1. Physical Characteristics

Table 3.1 shows the physical analysis results (a detailed breakdown of the sand fraction can be seen in Appendix 1). Gravel content ranged from 0 (Stations S08A and RSOS4) to 26.5% (Station D02). Sand content ranged from 70.2% (Station S01A) to 99.6% (Station D04). Silt-clay content ranged from 0% (Station D02) to 25.2 (Station ROS4). Moisture content ranged from 11.61% (Station D02) to 64.38 (Station ROS4). Density ranged from 1.46 g/ml (Station ROS4) to 2.23 g/ml (Station D01).

Table 3.1: Physical properties of sediment

Reference No.	Sample ID	% Gravel (>2mm)	% Sand (<2mm)	% Silt-Clay (<63µm)	Density (g/ml)	% Moisture
1	D01	19.5	80.2	0.2	2.23	16.11
2	D02	26.5	73.4	0	1.80	11.61
3	D03	0.2	99.4	0.4	2.05	19.43
4	D04	0.4	99.6	0.1	1.97	20.46
5	D05	2.5	97.5	0.1	1.95	18.06
6	S01A	5.9	70.2	23.9	1.62	47.90
7	S02A	0.3	75	24.7	1.56	56.77
8	S05A	10	72.1	17.9	1.69	41.92
9	S06A	3.5	75.9	20.6	1.68	40.46
10	S07A	0.7	78.2	21.1	1.66	43.85
11	S08A	0	79.5	20.5	1.63	47.46
12	S09A	0.1	87.4	12.4	1.74	41.98
13	S12A	0.2	78.5	21.4	1.54	47.35
14	ROS3	4.4	72.3	23.3	1.51	57.47
15	ROS4	0	74.8	25.2	1.46	64.38

3.1.1. Chemical Properties

Table 3.2 shows the results from the chemical analysis. Appendix 2 contains the laboratory report. Arsenic and nickel exceeded the lower Irish Action Limit at stations S01A, S02A, S05A, S06A, S07A, S08A, S09A, S12A, ROS3 and ROS4. ∑TBT & DBT exceeded the upper Irish Action Limit at Station S12A. Table 3.3 shows the Irish Action Limits.

Table 3.2: Chemical properties of sediment

Analyte	*Units*	D01	D02	D03	D04	D05	S01A	S02A	S05A	S06A	S07A	S08A	S09A	S12A	ROS3	ROS4
Hydrocarbons : Total : Dry Wt as Ekofisk	mg/kg	3.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury : Dry Wt	mg/kg	0.0078	0.0065	0.0072	0.007	0.0072	0.0553	0.0603	0.0487	0.053	0.0576	0.0594	0.0542	0.0474	0.0498	0.0374
Aluminium, HF Digest : Dry Wt	mg/kg	10800	11300	8460	9440	8760	50100	51800	46600	45800	45900	49300	45100	41000	47900	44700
Arsenic, HF Digest : Dry Wt	mg/kg	5.58	4.19	4.63	3.52	3.29	14	14.5	12.2	13.1	13	13.1	12.7	10.9	12.9	12.2
Cadmium, HF Digest : Dry Wt	mg/kg	0.138	0.025	0.034	0.027	0.051	0.169	0.15	0.181	0.2	0.173	0.159	0.139	0.154	0.173	0.237
Chromium, HF Digest : Dry Wt	mg/kg	8.47	10.5	7.81	6.59	15.8	73.7	78.5	73.5	73.1	71.9	71.1	66.6	61.4	77.8	87.4
Copper, HF Digest : Dry Wt	mg/kg	2.45	2.27	2.45	2.14	2.35	19.4	17.6	19.8	20.6	18.2	17	15.9	12.9	19.7	25.4
Lead, HF Digest : Dry Wt	mg/kg	5.58	4.26	4.4	4.43	4.56	29.5	30.8	26	25.4	25.9	27.6	25.6	26.9	26.9	27.1
Lithium, HF Digest : Dry Wt	mg/kg	10.5	10.6	10.5	9.06	9.41	60.4	62.5	56.3	52.4	54.5	60.2	53.9	46.6	55	47.1
Nickel, HF Digest : Dry Wt	mg/kg	3.94	5.17	3.62	3.08	3.53	30.3	30.4	27.7	28.2	27.6	28.5	26.7	23.5	29	29.9
Zinc : HF Digest : Dry Wt	mg/kg	13.6	11.9	9.38	8.94	9.02	108	107	101	97.9	93	94.5	86.3	76.7	89.2	59
Aldrin : Dry Wt	ug/kg	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
DDE –pp : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.11	0.159	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.138	<0.1
DDT –op : Dry Wt	ug/kg	<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
DDT –pp : Dry Wt	ug/kg	<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	0.322	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin : Dry Wt	ug/kg	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Endrin : Dry Wt	ug/kg	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HCH –alpha : Dry Wt	ug/kg	<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
HCH –beta : Dry Wt	ug/kg	<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
HCH –delta : Dry Wt	ug/kg	<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
HCH –gamma : Dry Wt :- {Lindane}	ug/kg	<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
Hexachlorobenzene : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.103	0.16	<0.1	<0.1	<0.1	<0.1	0.105	<0.1	0.114	<0.1
Hexachlorobutadiene : Dry Wt	ug/kg	<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
Isodrin : Dry Wt	ug/kg	<0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TDE – pp : Dry Wt	ug/kg	<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
Acenaphthene : Dry Wt	ug/kg	<1					2.58	4.43	2.48	2.43	2.31	3.02	1.73	1.96	3.81	3.57
Acenaphthylene : Dry Wt	ug/kg	<1					1.62	2.7	<1	<1	<1	1.58	<1	<1	2.2	1.4
Anthracene : Dry Wt	ug/kg	<1					7.59	11.3	6.49	5.64	5.68	8.32	4.71	6.23	10.4	9.12
Benzo(a)anthracene : Dry Wt	ug/kg	<1					14.4	27	11.9	12.9	12.2	16.9	12.4	14.4	27.3	21.5
Benzo(a)pyrene : Dry Wt	ug/kg	<1					17.9	33.1	15.2	14.5	12.3	27	20.8	24.2	36.5	19.5
Benzo(b)fluoranthene : Dry Wt	ug/kg	<1					30.2	57.3	19.9	21.4	22.8	32.7	17	23.9	44.5	21.8
Benzo(ghi)perylene : Dry Wt	ug/kg	<1					21.1	<1	18.2	18.3	16.8	22.5	17.5	21.9	41	15.6

Analyte	*Units*	D01	D02	D03	D04	D05	S01A	S02A	S05A	S06A	S07A	S08A	S09A	S12A	ROS3	ROS4
Benzo(k)fluoranthene : Dry Wt	ug/kg	<1					16.4	32.9	9.6	11.1	10.6	19.2	9.05	13.2	24.1	12.9
Chrysene + Triphenylene : Dry Wt	ug/kg	<3					20.6	40.4	15	16.8	16.2	26.2	18.3	19.6	41.8	24.6
Dibenzo(ah)anthracene : Dry Wt	ug/kg	<1					<1	<1	<1	<1	3.22	2.93	<1	<1	1.79	3.56
Fluoranthene : Dry Wt	ug/kg	1.77					28.4	51.1	23.1	23.2	22.3	36.4	20.5	23.9	44.7	43.3
Fluorene : Dry Wt	ug/kg	<5					10.6	18.4	8.5	7.84	8.46	10.9	7.45	8.04	15.6	8.25
Indeno(1,2,3-c,d)pyrene : Dry Wt	ug/kg	<1					24.2	37.7	19.4	17.2	18.5	27.7	26.6	25.8	42.8	22.5
Naphthalene : Dry Wt	ug/kg	<5					22.3	40.3	17	14.5	17.2	20.9	15.4	17.6	32.3	17
Phenanthrene : Dry Wt	ug/kg	<5					31.9	56	24.7	22.8	24.4	34.3	21.4	26	45.4	38.3
Pyrene : Dry Wt	ug/kg	<1					17.2	30.3	14.7	15.5	14.6	22.8	11.7	15.1	27	31.5
PCB – 028 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.175	0.372	0.143	0.131	0.163	0.202	0.175	0.167	0.316	0.144
PCB – 052 : Dry Wt	ug/kg	<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
PCB – 101 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	<0.1	0.136	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.109	<0.1
PCB – 138 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.13	0.249	<0.1	<0.1	<0.1	0.124	<0.1	0.109	0.17	<0.1
PCB – 153 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.148	0.245	0.104	<0.1	0.102	0.134	<0.1	0.124	0.195	0.102
PCB – 180 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	<0.1	0.102	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PCB – 118 : Dry Wt	ug/kg	<0.1			<0.1	<0.1	0.127	0.235	<0.1	<0.1	<0.1	0.125	<0.1	0.101	0.176	<0.1
Dibutyl Tin : Dry Wt as Cation	ug/kg	<4	<3	<4	<4	<4	<6	<7	<5	<5	<5	<5	<5	127	<7	<6
Tributyl Tin : Dry Wt as Cation	ug/kg	<4	<3	<4	<4	<4	<6	<7	<5	<5	<5	<5	<5	1040	<7	<6
Dry Solids @ 30°C	%	82.1	93.1	81.6	78.4	82.7	49.2	41.8	56.7	58.5	56.7	53.5	58.8	54.2	43.2	53.1
Loss on Ignition 450°C	%	0.05	0.01	0.1	0.02	0.03	2.19	2.27	1.50	1.55	1.79	1.57	0.84	1.81	2.01	2.28

Table 3.3: Irish Action Limits

Parameter	Units (dry wt) Note 2	Sampling points														
		D01	D02	D03	D04	D05	S01A	S02A	S05A	S06A	S07A	S08A	S09A	S12A	ROS3	ROS4
Arsenic	mg kg^{-1}	5.58	4.19	4.63	3.52	3.29	14	14.5	12.2	13.1	13	13.1	12.7	10.9	12.9	12.2
Cadmium	mg kg^{-1}	0.138	0.025	0.034	0.027	0.051	0.169	0.15	0.181	0.2	0.173	0.159	0.139	0.154	0.173	0.237
Chromium	mg kg^{-1}	8.47	10.5	7.81	6.59	15.8	73.7	78.5	73.5	73.1	71.9	71.1	66.6	61.4	77.8	87.4
Copper	mg kg^{-1}	2.45	2.27	2.45	2.14	2.35	19.4	17.6	19.8	20.6	18.2	17	15.9	12.9	19.7	25.4
Lead	mg kg^{-1}	5.58	4.26	4.4	4.43	4.56	29.5	30.8	26	25.4	25.9	27.6	25.6	26.9	26.9	27.1
Mercury	mg kg^{-1}	0.0078	0.0065	0.0072	0.007	0.0072	0.0553	0.0603	0.0487	0.053	0.0576	0.0594	0.0542	0.0474	0.0498	0.0374
Nickel	mg kg^{-1}	3.94	5.17	3.62	3.08	3.53	30.3	30.4	27.7	28.2	27.6	28.5	26.7	23.5	29	29.9
Zinc	mg kg^{-1}	13.6	11.9	9.38	8.94	9.02	108	107	101	97.9	93	94.5	86.3	76.7	89.2	59
Σ TBT & DBT Note 3	mg kg^{-1}	0.00798	0.00598	0.00798	0.00798	0.00798	0.01198	0.01398	0.00998	0.00998	0.00998	0.00998	0.00998	1.167	0.01398	0.01198
γ-HCH (Lindane) Note 4	µg kg^{-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
HCB Note 5	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	0.103	0.16	<0.1	<0.1	<0.1	<0.1	0.105	<0.1	0.114	<0.1
PCB (individual congeners of ICES 7) Note 6 PCB 028	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	0.175	0.372	0.143	0.131	0.163	0.202	0.175	0.167	0.316	0.144
PCB 052	µg kg^{-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
PCB 101	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	<0.1	0.136	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.109	<0.1
PCB 138	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	0.13	0.249	<0.1	<0.1	<0.1	0.124	<0.1	0.109	0.17	<0.1
PCB 153	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	0.148	0.245	0.104	<0.1	0.102	0.134	<0.1	0.124	0.195	0.102
PCB 180	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	<0.1	0.102	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PCB 118	µg kg^{-1}	<0.1	-	-	<0.1	<0.1	0.127	0.235	<0.1	<0.1	<0.1	0.125	<0.1	0.101	0.176	<0.1
PCB (Σ ICES 7) Note 6	µg kg^{-1}	0.693	-	-	0.693	0.693	0.877	1.439	0.742	0.725	0.76	0.882	0.769	0.798	1.164	0.741

Parameter	Units (dry wt) Note 2	Sampling points														
		D01	D02	D03	D04	D05	S01A	S02A	S05A	S06A	S07A	S08A	S09A	S12A	ROS3	ROS4
PAH (Σ 16) Note 7	μg kg^{-1}	30.62	-	-	-	-	267.98	444.91	208.15	30.62	0	0	0	0	267.98	444.91
Total Extractable Hydrocarbons	g kg^{-1}	0.00032	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Exceed Lower Irish Action Limit
	Exceeds Upper Irish Action Limit

Note 1: Applicants should highlight in Table B.1 any results which exceed either the upper or lower Irish action levels. Action levels are published in: *Cronin et al. 2006. Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters. Marine Environment & Health Series, No. 24. Marine Institute.*

Note 2: Total sediment <2 mm

Note 3: Sum of tributyl tin and dibutyl tin

Note 4: 1α,2α,3β,4α,5α,6β-hexachlorocyclohexane

Note 5: Hexachlorobenzene

Note 6: ICES 7 polychlorinated biphenyls: PCB 28, 52, 101, 118, 138, 153, 180.

Note 7: Polyaromatic hydrocarbons (measured as individual compounds): Naphthalene, Acenaphthylene, Acenaphthene, Fluorene,Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenzo(ah)anthracene, Benzo(ghi)perylene, Indeno(123-cd)pyrene.

3.1.2. Radiological Properties

At the time of finalising this report, the final radiological results were not available. However, preliminary results from a screening in June did not reveal any significant change in artificial activity levels. Cs-137 levels were of the order of 0.217 and 0.123 Bq/kg (dry) in the samples. As expected no other artificial radionuclides were found in the samples. The other radionuclides identified were of natural origin. The final results will be provided to the Department once available.

4. References

Cronin, M., McGovern, E., McMahon, T., & Boelens, R. (2006). Guidelines for the assessment of dredge material for disposal in Irish waters. http://oar.marine.ie/bitstream/10793/251/1/No%2024%20%20Marine%20Environment%20and%20Health%20Series.pdf

Appendix 1

Particle Size Analysis

Particle Size Analysis of sediment from the stations sampled at Rosslare Europort 16th May 2014.

Reference Number	Sample Point	Fine Gravel (4-8mm)	Very Fine Gravel (2-4mm)	Very Coarse Sand (1-2mm)	Coarse Sand (0.5-1mm)	Medium Sand (0.25-0.5mm)	Fine Sand (125-250mm)	Very Fine Sand (62.5-125mm)	Silt-Clay (<63mm)
1	D01	14.2	5.3	4.2	7.9	42.8	24.5	0.8	0.2
2	D02	18.2	8.3	10.1	18.2	39.4	5.6	0.1	0
3	D03	0.1	0.1	0.3	2.2	37.1	57.5	2.3	0.4
4	D04	0.1	0.3	0.8	3	20.1	72.8	2.9	0.1
5	D05	0.9	1.6	2.9	5.1	24.8	62.8	1.9	0.1
6	S01A	5	0.9	1.3	6.9	16.5	31.4	14.1	23.9
7	S02A	0.2	0.1	0.2	2.6	12.1	40.2	19.9	24.7
8	S05A	7.3	2.7	2.5	5	11.5	39.4	13.7	17.9
9	S06A	1.7	1.8	1.6	4	11.5	43.5	15.3	20.6
10	S07A	0.2	0.5	0.9	3.6	11.7	46.2	15.8	21.1
11	S08A	0	0	0.1	1	6	53.5	18.9	20.5
12	S09A	0	0.1	0.6	2.6	17.8	55.4	11	12.4
13	S12A	0	0.2	0.8	5.1	24.1	31.4	17.1	21.4
14	ROS3	2.1	2.3	4.9	8.7	15.1	23.4	20.2	23.3
15	ROS4	0	0	0.2	1.6	7.1	40.6	25.3	25.2

Appendix 2

Chemical Analysis Results

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

Batch description: JN1255 Rosslare Sediments

UKAS TESTING
0754

Reported on:
07-Jul-2014

Caroline Roche
AQUAFACT International Services Ltd
12 Kilkierrin Park
Liosbaun
Galway

Dear Caroline

Please find attached the results for the batch of 15 samples described below.

Samples Registered on:	23-May-2014
Analysis Started on:	23-May-2014
Analysis Completed on:	07-Jul-2014
Results for Batch Number	20065596
Your Purchase Order Number:	AF JN1255

You will be invoiced shortly by our accounts department.

If we can be of further assistance then please do not hesitate to contact us.

Yours sincerely

William Fardon
Customer Services Team Manager
Tel: (0113) 231 2177
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4b 4c 4d 4e 4f 4g
Folder No: 002798438
Sampled on: 16-May-14 @ 12:37
Comments: D01
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	NoResult	%			None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Hydrocarbons : Total : Dry Wt as Ekofisk	3.24	mg/kg		0.05	UKAS	LE	402
Mercury : Dry Wt	0.00780	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	10800	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	5.58	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.138	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	8.47	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	2.45	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	5.58	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	10.5	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	3.94	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	13.6	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	<3	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	1.77	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	<5	ug/kg	DC	5	UKAS	LE	1051

Pyrene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	82.1	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

328.96g of the sample was taken for drying at <30degC which gave 270.97g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4b 4c 4f
Folder No: 002798439
Sampled on: 16-May-14 @ 14:10
Comments: D02
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.00650	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	11300	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	4.19	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.0250	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	10.5	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	2.27	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	4.26	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	10.6	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	5.17	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	11.9	mg/kg	DC	0.05	UKAS	LE	341
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<3	ug/kg		3	UKAS	LE	897
Dry Solids @ 30°C	93.1	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

220.86g of the sample was taken for drying at <30degC which gave 206.07g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4b 4c 4f
Folder No: 002798440
Sampled on: 16-May-14 @ 12:55
Comments: D03
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.00720	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	8460	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	4.63	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.0340	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	7.81	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	2.45	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	4.40	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	10.5	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	3.62	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	9.38	mg/kg	DC	0.05	UKAS	LE	341
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<4	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	81.6	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

299.48g of the sample was taken for drying at <30degC which gave 245.51g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f

Folder No: 002798441

Sampled on: 16-May-14 @ 12:20

Comments: D04

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Mercury : Dry Wt	0.00700	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	9440	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	3.52	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.0270	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	6.59	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	2.14	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	4.43	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	9.06	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	3.08	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	8.94	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	78.4	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

235.17g of the sample was taken for drying at <30degC which gave 185.60g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f

Folder No: 002798442

Sampled on: 16-May-14 @ 12:05

Comments: D05

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Mercury : Dry Wt	0.00720	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	8760	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	3.29	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.0510	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	15.8	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	2.35	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	4.56	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	9.41	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	3.53	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	9.02	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	82.7	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

313.56g of the sample was taken for drying at <30degC which gave 260.32g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4c 4d 4f 4g
Folder No: 002798443
Sampled on: 16-May-14 @ 13:40
Comments: S01A
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0553	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	50100	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	14.0	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.169	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	73.7	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	19.4	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	29.5	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	60.4	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	30.3	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	108	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.110	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.103	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	2.58	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	1.62	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	7.59	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	14.4	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	17.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	30.2	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	21.1	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	16.4	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	20.6	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	28.4	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	10.6	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	24.2	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	22.3	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	31.9	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	17.2	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.175	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.127	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.130	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.148	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<6	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	49.2	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

209.53g of the sample was taken for drying at <30degC which gave 105.95g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4c 4d 4f 4g
Folder No: 002798444
Sampled on: 16-May-14 @ 13:25
Comments: S02A
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0603	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	51800	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	14.5	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.150	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	78.5	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	17.6	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	30.8	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	62.5	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	30.4	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	107	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.159	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.160	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	4.43	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	2.70	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	11.3	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	27.0	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	33.1	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	57.3	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	32.9	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	40.4	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	51.1	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	18.4	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	37.7	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	40.3	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	56.0	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	30.3	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.372	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	0.100	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.136	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.235	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.249	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.245	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.102	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<7	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<7	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	41.8	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

168.22g of the sample was taken for drying at <30degC which gave 73.75g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f 4g

Folder No: 002798445

Sampled on: 16-May-14 @ 14:55

Comments: S05A

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0487	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	46600	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	12.2	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.181	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	73.5	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	19.8	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	26.0	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	56.3	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	27.7	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	101	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	2.48	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	6.49	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	11.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	15.2	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	19.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	18.2	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	9.60	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	15.0	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	23.1	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	8.50	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	19.4	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	17.0	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	24.7	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	14.7	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.143	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.104	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<5	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	56.7	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

210.57g of the sample was taken for drying at <30degC which gave 121.83g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f 4g

Folder No: 002798446

Sampled on: 16-May-14 @ 14:45

Comments: S06A

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0530	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	45800	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	13.1	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.200	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	73.1	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	20.6	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	25.4	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	52.4	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	28.2	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	97.9	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	0.322	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	2.43	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	5.64	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	12.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	14.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	21.4	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	18.3	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	11.1	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	16.8	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	23.2	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	7.84	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	17.2	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	14.5	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	22.8	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	15.5	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.131	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	58.5	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

228.14g of the sample was taken for drying at <30degC which gave 135.92g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4c 4d 4f 4g
Folder No: 002798447
Sampled on: 16-May-14 @ 14:30
Comments: S07A
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0576	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	45900	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	13.0	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.173	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	71.9	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	18.2	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	25.9	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	54.5	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	27.6	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	93.0	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	2.31	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	5.68	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	12.2	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	12.3	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	22.8	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	16.8	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	10.6	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	16.2	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	3.22	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	22.3	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	8.46	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	18.5	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	17.2	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	24.4	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	14.6	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.163	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.102	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<5	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	56.7	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

208.89g of the sample was taken for drying at <30degC which gave 120.97g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4c 4d 4f 4g
Folder No: 002798448
Sampled on: 16-May-14 @ 14:20
Comments: S08A
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0594	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	49300	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	13.1	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.159	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	71.1	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	17.0	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	27.6	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	60.2	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	28.5	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	94.5	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	3.02	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	1.58	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	8.32	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	16.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	27.0	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	32.7	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	22.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	19.2	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	26.2	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	2.93	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	36.4	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	10.9	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	27.7	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	20.9	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	34.3	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	22.8	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.202	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.125	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.124	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.134	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	53.5	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

213.89g of the sample was taken for drying at <30degC which gave 117.11g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f 4g

Folder No: 002798449

Sampled on: 16-May-14 @ 14:00

Comments: S09A

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0542	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	45100	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	12.7	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.139	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	66.6	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	15.9	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	25.6	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	53.9	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	26.7	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	86.3	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.105	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	1.73	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	4.71	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	12.4	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	20.8	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	17.0	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	17.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	9.05	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	18.3	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	20.5	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	7.45	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	26.6	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	15.4	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	21.4	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	11.7	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.175	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	58.8	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

165.09g of the sample was taken for drying at <30degC which gave 99.38g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f 4g

Folder No: 002798450

Sampled on: 16-May-14 @ 11:50

Comments: S12A

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0474	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	41000	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	10.9	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.154	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	61.4	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	12.9	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	26.9	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	46.6	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	23.5	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	76.7	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	1.96	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	6.23	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	14.4	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	24.2	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	23.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	21.9	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	13.2	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	19.6	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	23.9	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	8.04	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	25.8	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	17.6	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	26.0	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	15.1	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.167	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.101	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.109	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.124	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	127	ug/kg		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	1040	ug/kg		3	UKAS	LE	897
Dry Solids @ 30°C	54.2	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

202.25g of the sample was taken for drying at <30degC which gave 112.20g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd
Project: Marine Sediment
Quote Description: 4a 4c 4d 4f 4g
Folder No: 002798451
Sampled on: 16-May-14 @ 13:10
Comments: ROS3
Quote No: 11203
Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0498	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	47900	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	12.9	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.173	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	77.8	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	19.7	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	26.9	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	55.0	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	29.0	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	89.2	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.138	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.114	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	3.81	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	2.20	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	10.4	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	27.3	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	36.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	44.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	41.0	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	24.1	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	41.8	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	1.79	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	44.7	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	15.6	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	42.8	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	32.3	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	45.4	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	27.0	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.316	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.109	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.176	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.170	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.195	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<7	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<7	ug/kg ELEVATED_MRV : Dry weight calculation		3	UKAS	LE	897
Dry Solids @ 30°C	43.2	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

187.73g of the sample was taken for drying at <30degC which gave 84.34g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

UKAS TESTING 0754

Batch description: JN1255 Rosslare Sediments

Reported on: 07-Jul-2014

Client: AQUAFACT International Services Ltd

Project: Marine Sediment

Quote Description: 4a 4c 4d 4f 4g

Folder No: 002798452

Sampled on: 16-May-14 @ 13:15

Comments: ROS4

Quote No: 11203

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Mercury : Dry Wt	0.0374	mg/kg	DC	0.002	UKAS	LE	1082
Aluminium, HF Digest : Dry Wt	44700	mg/kg	DC	50	UKAS	LE	756
Arsenic, HF Digest : Dry Wt	12.2	mg/kg	DC	0.2	UKAS	LE	341
Cadmium, HF Digest : Dry Wt	0.237	mg/kg	DC	0.01	UKAS	LE	341
Chromium, HF Digest : Dry Wt	87.4	mg/kg	DC	3	UKAS	LE	341
Copper, HF Digest : Dry Wt	25.4	mg/kg	DC	0.4	UKAS	LE	341
Lead, HF Digest : Dry Wt	27.1	mg/kg	DC	0.2	UKAS	LE	341
Lithium, HF Digest : Dry Wt	47.1	mg/kg	DC	0.1	UKAS	LE	341
Nickel, HF Digest : Dry Wt	29.9	mg/kg	DC	0.6	UKAS	LE	341
Zinc : HF Digest : Dry Wt	59.0	mg/kg	DC	0.05	UKAS	LE	341
Aldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	DC	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	3.57	ug/kg	DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	1.40	ug/kg	DC	1	None	LE	1051
Anthracene : Dry Wt	9.12	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	21.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	19.5	ug/kg	DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	21.8	ug/kg	DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	15.6	ug/kg	DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	12.9	ug/kg	DC	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	24.6	ug/kg	DC	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	3.56	ug/kg	DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	43.3	ug/kg	DC	1	UKAS	LE	1051
Fluorene : Dry Wt	8.25	ug/kg	DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	22.5	ug/kg	DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	17.0	ug/kg	DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	38.3	ug/kg	DC	5	UKAS	LE	1051
Pyrene : Dry Wt	31.5	ug/kg	DC	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.144	ug/kg	DC	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.102	ug/kg	DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<6	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	53.1	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment

208.15g of the sample was taken for drying at <30degC which gave 113.24g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20065596 - 1

Batch description: JN1255 Rosslare Sediments

UKAS TESTING
0754

Reported on:
07-Jul-2014

Method Description Summary for all samples in batch Number 20065596

341	LE M Metals ICP-MS Sediment - HF Digest Open Vessel Hotplate Digest, determined by ICPMS, samples are sieved to <63um.
402	LE I Hydrocarbons by UV- methanol digested, pentane xch, by UV fluorescence spectrometry
672	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
685	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
756	LE M Metals Marine (ICPOES) - Open Vessel Hotplate HF digest, determined by ICPOES, samples are sieved to <63um.
864	Parameter by calculation
897	LE O Organotins (GCMS) 01 - acetic acid/methanol extracted; derivatised; determined GCMS (SIM); from "as received" sample
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
1051	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
1082	LE M Mercury CSEMP - microwave aqua regia digested, acidic SnCl2 reduced, determined by CV-AFS, samples are sieved to <63um.
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.

Steve Moss
Laboratory Site Manager

All reporting limits quoted are those achievable for clean samples of the relevant matrix. No allowance is made for instances when dilutions are necessary owing to the nature of the sample or insufficient volume of the sample being available. In these cases higher reporting limits may be **00:00:00**quoted and will be above the MRV.
Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Key to Results Flags:

DC Analysis started outside of specified holding time. It is possible that the results may be compromised.

The analysis start date specified is the date of the first test, dates for other analysis are available on request.

Please note all samples will be retained for 10 working days for aqueous samples and 30 working days for solid samples after reporting unless otherwise agreed with Customer Services
Key to Accreditation: UKAS = Methodology accredited to ISO/IEC 17025:2005, MCertS = Methodology accredited to MCertS Performance Standard for testing of soils, none = Methodology not accredited
Key to Lab ID: LE = Leeds, NM = Nottingham, SX = Starcross, SC = Sub-Contracted outside NLS, FI = Field Data - outside NLS, NLS = Calculated

Any subsequent version of this report denoted with a higher version number will supersede this and any previous versions

END OF TEST REPORT