MP2 PROJECT

Volume 3

ENVIRONMENTAL IMPACT ASSESSMENT REPORT APPENDICES (PART 2B)

COMHLACHT CHALAFORT ÁTHA CLIATH
DUBLIN PORT COMPANY

rps MAKING COMPLEX EASY

APPENDIX 8 SOILS, GEOLOGY & HYDROGEOLOGY

Appendix 8-3

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S01 - S10)										Guideline Values	
		S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	Lower Level	Upper Level
		surface	2m	surface	2m	surface	3m	surface	surface	surface	8m		
Arsenic	mg kg^{-1}	6.8	9.4	7.2	7.1	5.1	9.7	12.6	5.8	5.5	7.4	20	70
Cadmium	mg kg^{-1}	0.3	0.5	0.3	0.1	0.2	0.8	0.6	0.2	0.2	0.9	0.7	4.2
Chromium	mg kg^{-1}	36.3	42.5	41.6	16.2	10.1	53.7	45.4	38.3	27.8	20.1	120	370
Copper	mg kg^{-1}	31.7	25.8	31.9	6.4	8.5	41.6	88.2	19.4	15.0	9.1	40	110
Lead	mg kg^{-1}	26.4	49.4	31.4	7.9	23.4	74.3	42.9	22.2	18.8	12.1	60	218
Mercury	mg kg^{-1}	0.1	0.1	0.1	0.0	5.3	0.2	0.1	0.0	0.0	0.0	0.2	0.7
Nickel	mg kg^{-1}	20.4	25.9	23.4	11.1	7.7	31.9	26.1	18.8	15.0	21.4	40	60
Zinc	mg kg^{-1}	94.9	128.0	111.0	29.6	43.1	183.0	193.0	77.2	61.0	48.2	160	410
(TBT + DBT)	mg kg^{-1}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
g-HCH (Lindane)	ug kg^{-1}	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1
PCB 028	ug kg^{-1}	0.3	0.9	0.4	0.1	0.2	1.8	0.4	0.2	0.3	0.1	1	180
PCB 052	ug kg^{-1}	0.2	0.4	0.3	0.1	0.1	0.8	0.6	0.1	0.1	0.1	1	180
PCB 101	ug kg^{-1}	0.1	0.4	0.2	0.1	0.1	0.8	0.2	0.1	0.1	0.1	1	180
PCB 118	ug kg^{-1}	0.2	0.4	0.2	0.1	0.1	0.9	0.2	0.1	0.1	0.1	1	180
PCB 138	ug kg^{-1}	0.1	0.4	0.2	0.1	0.1	0.9	0.2	0.1	0.1	0.1	1	180
PCB 153	ug kg^{-1}	0.2	0.5	0.2	0.1	0.1	1.1	0.3	0.1	0.1	0.1	1	180
PCB 180	ug kg^{-1}	0.1	0.3	0.1	0.1	0.1	0.8	0.2	0.1	0.1	0.1	1	180
Σ (7 PCBs)	ug kg^{-1}	1.2	3.4	1.5	0.0	0.3	7.1	2.0	0.7	0.4	0.0	7	1260
Hexachlorobenzine	ug kg^{-1}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	1
Acenaphthene	ug kg^{-1}	12.8	16.5	7.9	<1	<3	28.3	7.1	9.1	3.9	<2	-	-
Acenaphthylene	ug kg^{-1}	6.3	18.9	9.2	<1	3.3	46.2	13.1	4.3	3.6	<2	-	-
Anthracene	ug kg^{-1}	18.3	45.5	22.4	<1	5.7	82.3	20.2	27.5	13.9	<2	-	-
Benzo (a) anthracene	ug kg^{-1}	59.9	157.0	70.0	2.9	25.5	331.0	90.7	74.0	39.8	<2	-	-
Benzo (a) pyrene	ug kg^{-1}	71.8	184.0	92.8	3.3	54.8	367.0	118.0	79.4	45.6	2.3	-	-
Benzo (b) fluoranthene	ug kg^{-1}	82.5	204.0	101.0	3.3	50.6	381.0	122.0	86.0	49.5	8.3	-	-
Benzo (ghi) perylene	ug kg^{-1}	66.2	164.0	79.7	1.9	36.7	310.0	111.0	70.2	40.4	5.6	-	-
Benzo (k) fluoranthene	ug kg^{-1}	40.4	106.0	51.1	1.8	28.7	203.0	64.6	44.0	25.4	<2	-	-
Chrysene	ug kg^{-1}	51.6	112.0	54.8	<3	28.2	278.0	74.3	57.9	30.4	<7	-	-

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S01 - S10)										Guideline Values	
		S01	S02	S03	S04	S05	S06	S07	S08	S09	S10	Lower Level	Upper Level
		surface	*2m*	*surface*	*2m*	*surface*	*3m*	*surface*	*surface*	*surface*	*8m*		
Dibenz (a,h) anthracene	***ug kg^{-1}***	13.8	30.5	17.2	<1	8.5	69.0	22.7	15.3	8.7	<2	-	-
Flourene	***ug kg^{-1}***	16.9	31.2	17.0	<5	<10	58.7	16.8	16.3	7.7	<10	-	-
Fluoranthene	***ug kg^{-1}***	106.0	213.0	109.0	6.6	56.4	454.0	118.0	137.0	64.1	3.3	-	-
Indeno (1,2,3–cd)	***ug kg^{-1}***	61.6	159.0	75.1	1.6	36.8	285.0	93.2	66.7	37.2	<2	-	-
Naphthalene	***ug kg^{-1}***	23.7	57.7	30.4	<5	<10	89.1	31.2	23.3	13.1	<10	-	-
Phenanthrene	***ug kg^{-1}***	87.2	138.0	75.6	5.7	42.7	198.0	72.6	102.0	46.4	15.0	-	-
Pyrene	***ug kg^{-1}***	109.0	256.0	123.0	7.7	87.0	467.0	140.0	128.0	69.0	4.3	-	-
Σ (16 PAH)	***ug kg^{-1}***	828.0	1893.3	936.2	34.7	464.9	3647.6	1115.5	941.0	498.7	38.8	4000	-
Total Extractable Hydrocarbons	***g kg^{-1}***	2.5	2.7	2.1	0.0	0.0	8.9	5.5	0.7	1.0	0.0	1	

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S11 - S25)										Guideline Values	
		S11	S12	S13	S14	S15	S17	S18	S19	S21	S25	Lower Level	Upper Level
		surface	2m	surface	surface	2.0m	5.0m	surface	2m	8.0m	surface		
Arsenic	mg kg^{-1}	6.4	8.9	4.9	6.5	8.8	11.0	6.4	4.5	8.8	6.4	20	70
Cadmium	mg kg^{-1}	0.2	0.5	0.2	0.2	0.1	0.5	0.2	0.1	0.3	0.3	0.7	4.2
Chromium	mg kg^{-1}	34.0	40.7	13.0	15.3	9.4	54.3	32.4	2.0	31.8	27.1	120	370
Copper	mg kg^{-1}	16.3	26.7	10.7	18.2	4.0	30.3	18.0	8.1	8.2	21.3	40	110
Lead	mg kg^{-1}	20.2	51.8	58.0	15.9	10.6	63.3	23.2	10.6	10.2	22.5	60	218
Mercury	mg kg^{-1}	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.7
Nickel	mg kg^{-1}	16.9	23.7	7.7	9.1	5.8	29.6	18.0	6.7	19.4	15.9	40	60
Zinc	mg kg^{-1}	67.1	130.0	50.2	52.0	21.1	152.0	74.2	35.1	45.4	75.9	160	410
(TBT + DBT)	mg kg^{-1}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
g-HCH (Lindane)	ug kg^{-1}	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1
PCB 028	ug kg^{-1}	0.2	1.2	0.1	0.1	0.3	0.9	0.2	0.1	0.1	0.3	1	180
PCB 052	ug kg^{-1}	0.1	0.5	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.2	1	180
PCB 101	ug kg^{-1}	0.1	0.5	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	1	180
PCB 118	ug kg^{-1}	0.1	0.6	0.1	0.1	0.1	0.6	0.1	0.1	0.1	0.1	1	180
PCB 138	ug kg^{-1}	0.1	0.5	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	1	180
PCB 153	ug kg^{-1}	0.1	0.7	0.1	0.1	0.1	0.6	0.1	0.1	0.1	0.2	1	180
PCB 180	ug kg^{-1}	0.1	0.4	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	1	180
Σ (7 PCBs)	ug kg^{-1}	0.3	4.4	0.0	0.1	0.4	3.9	0.7	0.0	0.0	1.1	7	1260
Hexachlorobenzine	ug kg^{-1}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	1
Acenaphthene	ug kg^{-1}	5.5	21.5	<2	2.1	<1	19.4	7.4	1.3	<1	7.7	-	-
Acenaphthylene	ug kg^{-1}	3.4	25.5	2.4	5.2	<1	21.5	4.9	2.5	<1	7.9	-	-
Anthracene	ug kg^{-1}	13.4	65.0	5.9	8.7	2.8	54.5	15.6	7.1	1.2	25.2	-	-
Benzo (a) anthracene	ug kg^{-1}	42.3	208.0	15.9	59.9	6.8	184.0	52.5	31.2	1.0	69.6	-	-
Benzo (a) pyrene	ug kg^{-1}	50.2	247.0	29.5	78.5	7.5	224.0	66.2	38.4	<1	86.8	-	-
Benzo (b) fluoranthene	ug kg^{-1}	61.8	262.0	25.7	67.3	7.8	255.0	72.8	33.8	4.3	85.7	-	-
Benzo (ghi) perylene	ug kg^{-1}	47.6	211.0	20.8	57.8	4.1	205.0	61.5	25.5	3.0	67.3	-	-
Benzo (k) fluoranthene	ug kg^{-1}	30.3	137.0	14.1	38.4	4.0	127.0	36.6	19.3	<1	45.2	-	-
Chrysene	ug kg^{-1}	36.6	160.0	11.5	47.1	5.5	145.0	43.1	23.5	<3	52.1	-	-
Dibenz (a,h) anthracene	ug kg^{-1}	10.2	47.8	5.0	12.4	<1	45.3	13.1	5.8	<1	14.8	-	-

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S11 - S25)										Guideline Values	
		S11	S12	S13	S14	S15	S17	S18	S19	S21	S25	Lower Level	Upper Level
		surface	2m	surface	surface	2.0m	5.0m	surface	2m	8.0m	surface		
Flourene	ug kg^{-1}	11.9	45.0	<10	<5	<5	40.2	13.4	<5	<5	15.5	-	-
Fluoranthene	ug kg^{-1}	79.4	289.0	19.0	68.9	16.6	265.0	91.4	50.3	2.1	109.0	-	-
Indeno (1,2,3–cd)	ug kg^{-1}	44.3	203.0	20.2	52.6	3.7	205.0	57.0	25.0	1.1	63.9	-	-
Naphthalene	ug kg^{-1}	22.3	76.6	<10	6.9	<5	69.7	23.8	<5	<5	27.6	-	-
Phenanthrene	ug kg^{-1}	69.2	168.0	12.5	24.0	7.0	158.0	74.2	20.7	8.1	77.7	-	-
Pyrene	ug kg^{-1}	76.3	334.0	31.4	82.7	19.9	308.0	96.2	52.9	2.4	136.0	-	-
Σ (16 PAH)	ug kg^{-1}	604.8	2500.4	213.9	612.6	85.5	2326.6	729.6	337.3	23.2	892.0	4000	-
Total Extractable Hydrocarbons	g kg^{-1}	0.7	8.0	0.0	1.9	0.0	3.2	0.6	0.0	0.0	1.3	1	

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S27-S37)										Guideline Values	
		S27	S29	S30	S31	S32	S33	S34	S35	S36	S37	Lower Level	Upper Level
		surface	surface	surface	surface	surface	surface	5.0m	5.0m	surface	surface		
Arsenic	mg kg^{-1}	6.5	7.8	2.9	12.2	10.2	9.3	6.8	8.9	12.2	12.2	20	70
Cadmium	mg kg^{-1}	0.2	0.3	0.3	0.5	0.4	0.6	1.9	0.3	0.8	0.8	0.7	4.2
Chromium	mg kg^{-1}	33.5	41.0	17.8	50.3	48.1	44.6	21.8	36.4	46.8	49.2	120	370
Copper	mg kg^{-1}	19.1	20.0	23.6	28.6	27.8	31.9	16.8	13.1	36.3	36.7	40	110
Lead	mg kg^{-1}	25.2	27.7	25.6	37.1	36.6	33.2	11.4	16.4	45.2	45.4	60	218
Mercury	mg kg^{-1}	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.7
Nickel	mg kg^{-1}	19.0	20.4	61.8	29.1	27.8	26.4	27.6	24.4	28.4	28.7	40	60
Zinc	mg kg^{-1}	82.9	90.9	94.7	121.0	114.0	116.0	66.2	59.3	153.0	152.0	160	410
(TBT + DBT)	mg kg^{-1}	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
g-HCH (Lindane)	ug kg^{-1}	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1
PCB 028	ug kg^{-1}	0.2	0.8	0.4	0.5	0.4	0.7	0.1	0.1	1.8	1.5	1	180
PCB 052	ug kg^{-1}	0.1	0.3	0.2	0.2	0.2	0.3	0.1	0.1	0.8	0.6	1	180
PCB 101	ug kg^{-1}	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.6	0.5	1	180
PCB 118	ug kg^{-1}	0.1	0.3	0.2	0.3	0.2	0.3	0.1	0.1	0.7	0.6	1	180
PCB 138	ug kg^{-1}	0.2	0.4	0.2	0.3	0.3	0.2	0.1	0.1	0.6	0.5	1	180
PCB 153	ug kg^{-1}	0.2	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.7	0.6	1	180
PCB 180	ug kg^{-1}	0.1	0.4	0.2	0.2	0.3	0.2	0.1	0.1	0.5	0.4	1	180
Σ (7 PCBs)	ug kg^{-1}	1.0	2.8	1.8	2.0	2.0	2.3	0.0	0.1	5.7	4.8	7	1260
Hexachlorobenzine	ug kg^{-1}	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	1
Acenaphthene	ug kg^{-1}	4.6	13.5	14.2	8.9	9.4	11.3	<2	3.9	17.4	17.2	-	-
Acenaphthylene	ug kg^{-1}	3.8	13.8	6.7	6.9	10.6	15.2	<2	7.2	29.8	26.8	-	-
Anthracene	ug kg^{-1}	13.1	39.8	27.9	21.2	26.3	44.9	<2	24.9	65.2	64.8	-	-
Benzo (a) anthracene	ug kg^{-1}	43.8	123.0	89.6	67.4	82.9	123.0	<2	66.9	177.0	202.0	-	-
Benzo (a) pyrene	ug kg^{-1}	55.1	148.0	102.0	84.1	103.0	142.0	<2	65.2	244.0	253.0	-	-
Benzo (b) fluoranthene	ug kg^{-1}	65.0	153.0	117.0	105.0	117.0	142.0	9.6	59.2	241.0	241.0	-	-
Benzo (ghi) perylene	ug kg^{-1}	54.5	131.0	97.9	82.5	94.3	115.0	5.6	44.4	209.0	200.0	-	-
Benzo (k) fluoranthene	ug kg^{-1}	31.9	78.1	58.8	51.0	58.7	74.9	<2	30.3	122.0	128.0	-	-
Chrysene	ug kg^{-1}	33.8	88.8	69.7	56.1	69.4	101.0	7.8	57.4	127.0	147.0	-	-

Parameter	Units (Dry Wt)	Sampling Points Sampling Points (S27-S37)										Guideline Values	
		S27	S29	S30	S31	S32	S33	S34	S35	S36	S37	Lower Level	Upper Level
		surface	surface	surface	surface	surface	surface	5.0m	5.0m	surface	surface		
Dibenz (a,h) anthracene	ug kg^{-1}	11.4	27.6	20.5	17.7	20.8	27.0	<2	11.0	45.6	46.4	-	-
Flourene	ug kg^{-1}	11.1	26.5	21.1	19.7	20.8	25.6	<10	<10	35.2	33.9	-	-
Fluoranthene	ug kg^{-1}	67.6	175.0	162.0	110.0	127.0	186.0	3.4	85.3	239.0	283.0	-	-
Indeno (1,2,3–cd)	ug kg^{-1}	50.1	117.0	87.7	81.6	90.5	109.0	<2	39.9	195.0	191.0	-	-
Naphthalene	ug kg^{-1}	22.0	45.8	33.5	34.3	38.5	39.9	<10	<10	56.8	52.8	-	-
Phenanthrene	ug kg^{-1}	50.7	119.0	124.0	88.1	94.3	125.0	33.4	37.2	151.0	153.0	-	-
Pyrene	ug kg^{-1}	70.9	194.0	160.0	109.0	135.0	197.0	5.6	107.0	305.0	323.0	-	-
Σ (16 PAH)	ug kg^{-1}	589.4	1493.9	1192.6	943.5	1098.5	1478.8	65.4	639.8	2260.0	2362.9	4000	-
Total Extractable Hydrocarbons	g kg^{-1}	0.4	1.1	1.6	0.9	1.4	3.4	0.0	0.0	3.2	2.0	1	

FUGRO

Investigation for Chemical Analysis of Sediment without Geoenvironmental Interpretation.
MP2 Marine Site Investigation - Sediment Quality
Dublin Bay, County Dublin, Ireland

Contact No.: G180021U
12 December 2018

Dublin Port Company

COMHLACHT CHALAFORT ÁTHA CLIATH
DUBLIN PORT COMPANY

RPS

Draft for Comment

FUGRO

Investigation for Chemical Analysis of Sediment without Geoenvironmental Interpretation.
MP2 Marine Site Investigation - Sediment Quality
Dublin Bay, County Dublin, Ireland

Contract No.: G180021U
12 December 2018

Draft for Comment

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01	Draft for Comment	AF/BAM	NHA	NH Armstrong	12 December 2018
Issue	**Document Status**	**Prepared**	**Checked**	**Approved**	**Date**

Our ref: G180021U(01)
Date: 12 December 2018

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Attention: Joseph McGrath

Dear Sirs,

Investigation for Chemical Analysis of Sediment without Geoenvironmental Interpretation.: MP2 Marine Site Investigation - Sediment Quality . Dublin Bay, County Dublin, Ireland

We have the pleasure of submitting our report on the above. The report was prepared by A Fudge and B Marsden under the supervision of N H Armstrong.

We hope that you find this report to your satisfaction; should you have any queries, please do not hesitate to contact us.

Yours faithfully,
B Marsden

B Marsden
Reporting Engineer

N H Armstrong
Engineering and Reporting Manager

Distribution: One electronic copy to Joseph McGrath

CONTENTS

APPENDICES

TABLES IN THE MAIN TEXT

ABBREVIATIONS

ATN	Abortive Test Notice
BS	British Standard
bsl	Below seabed level
Bgl	Below ground level
CD	Chart Datum
CM	Central Meridian
CP	Cable Percussion
DAS	Dumping at Sea (Permit)
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency (Ireland)
GRS	Geodetic Reference System
ITM	Irish Transverse Mercator
JUB	Jack Up Barge
LAT	Lowest Astronomical Tide
MSL	Mean Sea Level
NLS	National Laboratory Service
OpCo	Operating Companies
ODM	Ordnance Datum (Malin Head)
UKAS	United Kingdom Accreditation Service
UHR	Ultra-High Resolution (2D seismic data)
UTM	Universal Transverse Mercator
VORF	Vertical Offshore Reference Frame
WE	Work Element
WGS84	World Geodetic System 1984

1. INTRODUCTION

On the instructions and under the supervision of RPS Group (the Investigation Supervisor) acting on behalf of Dublin Port Company (the Employer), a site investigation has been carried out by Fugro GeoServices Limited (FGSL) at Dublin Bay, County Dublin, Ireland.

It is proposed to initiate dredging operations and the provision of new berths and turning circles within Dublin Port, and the navigation channel used by craft entering the port complex.

A previous investigation was carried out at the site by Fugro in 2016 and the findings were presented in Fugro report Ref. CP1501005(C1791).

The objective of this investigation was to gain additional information on sediment quality at the site and to provide information that would assist the Investigation Supervisor in the design of the proposed dredging works. The scope of the investigation was determined by the Investigation Supervisor.

The report has been provided in .pdf format only.

The nearshore site work was undertaken from the FGSL jack-up barge Aran 120A between 10 August to 22 August 2018. The works were conducted simultaneously with an additional geotechnical investigation of the site. The results of the geotechnical investigation are presented in Fugro report Ref. G180021UG.

2. THE SITE AND GEOLOGY

2.1 Site Location and Description

The proposed dredging and development zone is located within Dublin Port and extends into a busy navigation channel used by a variety of vessels for access into the port complex. The sediment sampling locations were distributed around various bays within the port complex, and along the margins of the navigation channel.

2.2 Geology

Information provided by the Client and available from the Geological Survey Ireland (Online) indicate that the site is underlain by:

- made ground;
- estuarine and alluvial deposits;
- Dublin Port Clay;
- cohesive glacial till deposits derived from limestone (including Dublin Boulder Clay);
- Lucan Formation (limestone).

Further background research such as a desk study was not required to be completed by FGSL within the terms of reference for the works.

3. MARINE GEOTECHNICAL INVESTIGATION

3.1 Scope of Work

The investigation was carried out in accordance with BS 5930:2015, BS EN ISO 14688-1:2017 and BS EN ISO 14689-1:2018 and BS 10175:2011+A1:2013 as appropriate.

A Schedule of Sample Locations including depths in metres below seabed level (mbsl), survey details and sampling locations is given in Table 3.1 below and in Appendix B.

Table 3.1: Schedule of Sample Locations

Sample ID	Date Sampled	Longitude	Latitude	Seabed Elevation	Sampling Depth
		(°W)	(°N)	(mCD)	(msl)
S1	13/08/2018	-6.16959	53.34220	-2.30	0.00
S2	13/08/2018	-6.17148	53.34236	-2.90	2.00
S3	13/08/2018	-6.17327	53.34220	-4.40	0.00
S4	15/08/2018	-6.17450	53.34136	-0.20	2.00
S5	10/08/2018	-6.17566	53.34131	0.10	0.00
S6	13/08/2018	-6.17683	53.34228	-2.90	3.00
S7	13/08/2018	-6.17726	53.34210	-1.90	0.00
S8	18/08/2018	-6.17780	53.34507	-3.40	0.00
S9	18/08/2018	-6.17830	53.34464	-7.70	0.00
S10	14/08/2018	-6.17831	53.34160	-0.20	8.00
S11	18/08/2018	-6.17867	53.34491	-3.20	0.00
S12	14/08/2018	-6.17945	53.34248	-2.10	2.00
S13	14/08/2018	-6.17995	53.34139	1.00	0.00
S14	12/08/2018	-6.17998	53.34193	0.10	0.00
S15	14/08/2018	-6.18095	53.34186	0.60	2.00
S17	12/08/2018	-6.18224	53.34254	-2.70	5.00
S18	18/08/2018	-6.18246	53.34468	-6.40	0.00
S19	12/08/2018	-6.18279	53.34201	0.10	0.00
S21	20/08/2018	-6.18326	53.34497	-1.70	8.00
S25	14/08/2018	-6.18364	53.34258	-8.00	0.00
S27	18/08/2018	-6.18437	53.34472	-3.80	0.00
S29	19/08/2018	-6.18554	53.34478	-2.50	0.00
S30	20/08/2018	-6.18667	53.34519	-0.70	0.00
S31	17/08/2018	-6.20013	53.34505	-9.60	0.00
S32	17/08/2018	-6.20095	53.34491	-11.10	0.00
S33	17/08/2018	-6.20203	53.34463	-8.60	0.00
S34	17/08/2018	-6.20410	53.34505	-4.30	5.00
S35	15/08/2018	-6.20500	53.34716	-2.50	5.00
S36	15/08/2018	-6.20549	53.34714	-3.50	0.00
S37	17/08/2018	-6.20523	53.34542	-10.60	0.00
S38	17/08/2018	-6.20432	53.34708	-4.10	0.00
S39	17/08/2018	-6.20388	53.34710	-1.20	0.00
S40	18/08/2018	-6.20436	53.34622	-7.50	0.00
S41	17/08/2018	-6.20393	53.34620	-1.80	0.00
S42	18/08/2018	-6.20445	53.34539	-7.10	0.00
S43	17/08/2018	-6.20401	53.34536	-3.70	0.00

Notes. Sample locations converted to WGS84 decimal degrees as requested in MP2 Marine SI – Chemical Sediment Analysis Specification.

A site plan showing the approximate positions of the sampling locations is presented in Figures B.1 to B.5 in Appendix B.

The site was designated to be in the British Drilling Association yellow category and appropriate protection measures were undertaken

3.2 Marine Activities

3.2.1 Site Activities

The field operations were carried out twenty-four hours a day in two twelve-hour shifts. A breakdown of the site activities is given in Table 3.2. The sediment sampling operations were conducted alongside a geotechnical investigation carried out for the Client from the same JUB. The figures given in Tables 3.2 and 3.3 relate to the work carried out for both investigations.

Table 3.2: Summary of Activities

Activity	Duration (hrs)
Mobilisation	29.59
Drilling/General Operations	193.84
Fugro Standby	2.92
Standby (Other)	59.28
Marine Mammal Observations	15.89

Daily Progress Records (DPR) were completed for each 24-hour period during the site work, defined from midnight to midnight, and include information on the field operations and activities together with summary information relating to progress. The DPRs are presented in Appendix F.

3.3 Vessels, Plant and Equipment

The site work was conducted using the FGSL jack-up barge Aran 120A which was specifically developed for performing nearshore, high quality geotechnical site investigations and construction works. The barge includes a four-leg jack-up system allowing works in the intertidal zone up to 20 m water depth. Drilling, testing and sampling equipment on the Aran 120A comprised:

- Comacchio MC–S 1200 hydraulic drill rig capable of both rotary and percussive drilling operations.

- Dando 3T Winch

- Mud mixing system – used to mix and hold the drill flush used during drilling operations to stabilise the borehole;

- Heavy duty 7” diameter casing – thick walled casing used as a conductor casing from the barge to mudline;

- Terracore S-Geobor wireline triple barrel rotary coring system, with semi-rigid core liner and seawater/guar gum flush, which produces a hole diameter of 146 mm and a core sample of 102 mm diameter (nominal) and, when deployed with a non-coring bit, produces an open hole of 146 mm diameter;

- Sliding hammers enable thin-walled or thick-walled samples of 450 mm or 1000 mm nominal length to be pushed into the ground in advance of the borehole;

- Trip hammers used to carry out standard penetration tests;

- Dual Van Veen Grab Sampler.

Equipment data sheets are presented in Appendix G.

3.3.1 Health, Safety and Environment

A Hazard Observation Card (HOC) system was operated on board allowing crew to report Unsafe Acts, Unsafe Conditions, Safe Acts, or make HSE suggestions. HOCs are uploaded to the Fugro IMPACT system which allow them to be tracked, monitored and responsibilities relating to their close out to be assigned with an automated follow-up system in place.

In addition to the HOC system, Fugro IMPACT is also used to report on more serious incidents. An incident includes any accident, near miss or dangerous occurrence and any accidents in which any employee was injured or any damage to equipment was suffered.

The health, safety and environment statistics for the site work period are summarised in Table 3.3: Health and Safety Statistics below.

Table 3.3: Health and Safety Statistics

Activity	Duration (hrs) / Number
Contractors total exposure (hours)	1680
HOCs	0
HSE Meetings	0
Safety Drills	1
Tool Box Talks	22
Incidents/Near Misses	1

3.4 Navigation and Positioning Survey

During primary positioning of the Aran 120A Jack Up Barge (JUB) use was made of a Starfix HP/XP/G2 System whilst the heading was determined using a Meridian Gyrocompass with a ProTrack GNSS system providing a backup. Antenna position data was combined with the gyro compass data in StarFix.NG navigation software to compute the vessel position.

The JUB's positioning systems were configured to record all navigation data which enables replay of the barge movements and review offline. A mean position report was configured to the Client's specification to provide the positional information for each exploratory location. The mean position reports are reproduced in Appendix E. Individual reports were taken for each sampling location, a small number of which are coincidental with drilling positions and use the same MPR.

3.5 Geodetic and Projection Parameters and Vertical Datum

3.5.1 Project Coordinate Reference System

Table 3.4 provides details of the geodetic datum and map projection adopted for the project.

Table 3.4: Project Geodetic and Projection Parameters

Project Geodetic Datum	
Geodetic Datum:	IRENET95
Ellipsoid:	GRS 1980
Semi major axis:	6378137.000
Inverse Flattening:	298.257222101
Project Projection Parameters	
Projection:	Transverse Mercator
Grid:	Irish Transverse Mercator
Longitude of Origin:	008°00'00.0000"W
Latitude of Origin:	53°30’00.000”N
False Easting:	600000.000 m
False Northing:	750000.000 m
Scale factor on Central Meridian:	0.99982
Units:	Metre
Vertical Datum	
Datum:	Chart Datum (CD)
Note: Chart Datum is 2.50 m below ODM.	

3.5.2 Vertical Datum

The vertical datum for this project is Chart Datum (CD), this is 2.50m below Irish Ordnance Datum (Malin Head).

3.5.3 Depth Measurement

The depth to seabed was measured by a weighted sounding lead prior to testing at the location. The depths stated in Table 3.1: Schedule of Sample Locations are referenced as metres below seabed.

4. SAMPLING OPERATIONS

4.1.1 General

The Sediment Quality samples comprised:

1 No. 300ml plastic bag, 1 No. 500ml white plastic tub, 1 No. 125ml glass jar, 1 No. 250ml amber glass jar and 1 No. 1kg white plastic tub.

Sample containers were double bagged in airtight plastic bags and then frozen onsite. Prior to their transfer by courier to NLS, Leeds, UK, the samples were transferred into a “correx” type crate and surrounded by ice packs to maintain their temperature.

Additional samples comprising 3 No. 1kg white plastic tubs were taken at four sampling locations (S7, S18, S33 and S37) for radionuclide testing as specified. Radionuclide testing samples were also frozen on site and then sent to Radiological Protection Institute of Ireland, Dublin.

At six positions (S4, S11, S14, S27, S35 and S37) samples were taken for Waste Acceptance Criteria testing carried out by NLS. These samples were placed in 1 No. 1kg white plastic tub and 1 No. 250ml amber glass jar.

Photographs of the recovered material, prior to subsampling into the above containers, are available in Appendix C.1.

4.1.2 Sediment Sampling

Samples were taken as directed from 36 locations as detailed in Table 3.2 above. At 26 locations, “surface” samples of seabed sediment were taken using a Dual Van Veen grab deployed using the on-deck crane aboard Aran120A. At each location the JUB was manoeuvred into position by a support vessel, and the legs lowered to mudline to secure the barge in place during operations. The Van Veen sampler was slowly lowered to seabed level, and after touching down, activated to collect a surface sample. The sampler was then returned to deck and the material deposited into a clean sample bucket to allow sub-sampling into appropriate containers.

At 10 locations, samples for sediment quality analyses were taken at depths ranging from 2.00m bsl and 8m bsl from boreholes constructed using light cable tool percussion boring techniques. On recovery, the sample was deposited into a clean sample bucket to allow the onboard Engineer to subsample into appropriate containers.

5. GEOENVIRONMENTAL TESTING

Chemical analyses and radionuclide tests were scheduled by the Employer. Chemical analysis was undertaken by NLS, Leeds, UK NLS hold UKAS accreditation for the testing undertaken.

Radionuclide testing was undertaken by Radiological Protection Institute of Ireland.

A schedule of analytical suites is given in Table 7.1, while details of each suite are given Table D.3.1 and Figure D.3.2 in Appendix D.

The results are given in NLS certificates of analysis reference numbers, listed below and in presented in Appendix D. These results include details of any deviating samples and the reasons for any deviations.

- 20124889 – 2
- 20124893 – 2
- 20126156 – 1
- 20127158 – 2

Table 7.1: Schedule of Analytical Suites

Sample	Depth	Area	Easting (m)	Northing (m)	Suite Scheduled
1	0.00m	TC_South_surface	721886.62	734002.92	Environmental
2	2.00m	TC_South_deep	721760.47	734018.02	Environmental
3	0.00m	TC_South_surface	721642.2	733997.04	Environmental
4	2.00m	TC_South_deep	721562.64	733900.89	Environmental, WAC
5	0.00m	TC_South_surface	721485.20	733893.24	Environmental
6	3.00m	TC_South_deep	721404.92	733999.13	Environmental
7	0.00m	TC_South_surface	721376.86	733978.97	Environmental, Radionuclide
8	0.00m	TC_North_surface	721332.26	734308.31	Environmental
9	0.00m	TC_North_surface	721299.82	734259.55	Environmental
10	8.00m	TC_South_deep	721307.95	733921.70	Environmental
11	0.00m	TC_North_deep	721274.78	734289.09	Environmental, WAC
12	2.00m	TC_South_deep	721229.59	734017.15	Environmental
13	0.00m	TC_South_surface	721199.17	733895.77	Environmental
14	0.00m	TC_South_surface	721195.59	733955.09	Environmental, WAC
15	2.00m	TC_South_deep	721131.34	733945.32	Environmental
17	5.00m	TC_South_deep	721043.40	734019.05	Environmental
18	0.00m	TC_North_surface	721022.98	734257.57	Environmental, Radionuclide
19	0.00m	TC_South_surface	721008.34	733959.14	Environmental
21	8.00m	TC_North_deep	720968.67	734288.09	Environmental
25	0.00m	TC_South_surface	720950.45	734021.29	Environmental
27	0.00m	TC_North_surface	720895.67	734258.81	Environmental, WAC
29	0.00m	TC_North_deep	720817.42	734262.95	Environmental
30	0.00m	TC_North_surface	720741.45	734306.16	Environmental
31	0.00m	Berth_50_deep	719845.24	734268.07	Environmental
32	0.00m	Berth_50_surface	719791.52	734252.02	Environmental
33	0.00m	Berth_50_surface	719720.43	734219.02	Environmental, Radionuclide
34	5.00m	Berth_50_deep	719581.46	734262.00	Environmental
35	5.00m	Berth_50_deep	719515.34	734495.01	Environmental, WAC

Sample	Depth	Area	Easting (m)	Northing (m)	Suite Scheduled
36	0.00m	Berth_50_surface	719482.81	734491.98	Environmental
37	0.00m	Berth_50_surface	719504.89	734301.55	Environmental, Radionuclide, WAC
38	0.00m	Oil_Jetty_4	719560.71	734487.76	Environmental
39	0.00m	Oil_Jetty_4	719590.30	734490.55	Environmental
40	0.00m	Oil_Jetty_4	719560.84	734391.22	Environmental
41	0.00m	Oil_Jetty_4	719589.04	734389.78	Environmental
42	0.00m	Oil_Jetty_4	719556.93	734298.98	Environmental
43	0.00m	Oil_Jetty_4	719586.31	734296.07	Environmental

A composite table of results has been prepared using the prescribed layout for Environmental Protection Agency (EPA), Dumping at Sea (DaS) applications, and is presented in Appendix D.5, along with figures of the usage instructions, methods information and quality assessments for the results.

The results of radionuclide testing were not available at the time of issue of this report.

6. REFERENCES

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APPENDICES

A. LIMITATIONS ON USE OF DATA

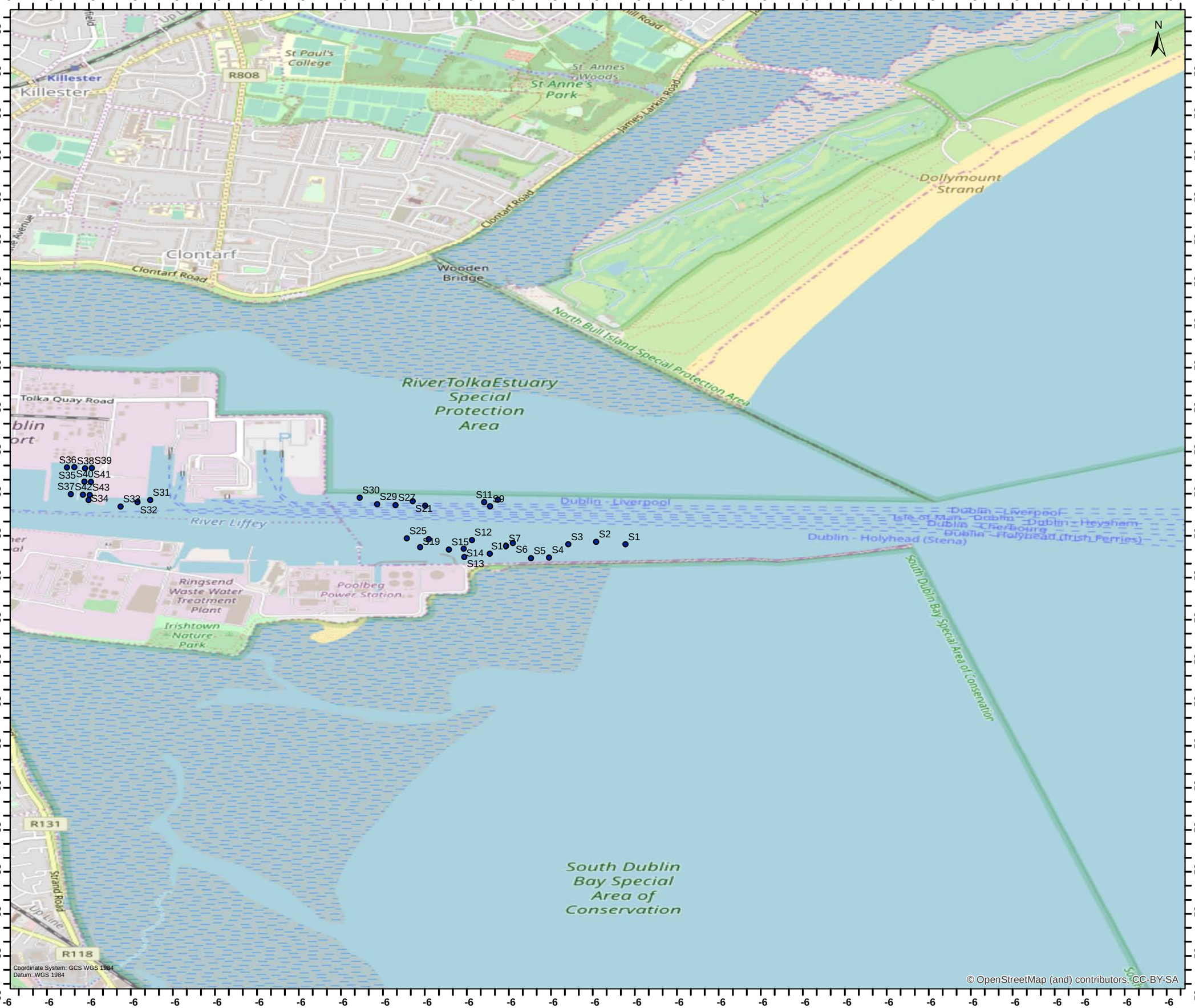
The scope of the investigation was determined by RPS Group for the particular project requirements set out in the Specification for the Contract. The data presented in this report reflects the site conditions encountered at the time the investigation was performed. The investigation has disclosed evidence of conditions at point locations across the site which provides information about discrete volumes of soil or rock. Accordingly, there may be ground conditions at the site which may not have been revealed by the investigation, and the passage of time may give rise to changes in the conditions encountered. Any interpolation or extrapolation of strata from the exploratory boreholes is subject to the interpretation of the reader. Any cross-sections or plots are generalised by necessity and have been based on information found at the exploratory boreholes and depths sampled and tested. The exploratory borehole records should be read in conjunction with the Notes on Exploratory Hole Records presented in this report.

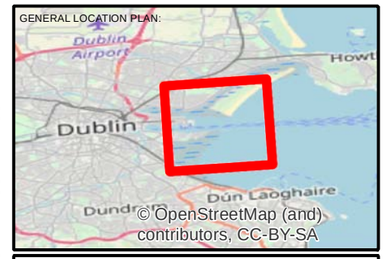
The investigation has been carried out by Fugro GeoServices Limited and the report has been prepared for the sole internal use of Dublin Port Company. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Fugro GeoServices Limited. If an unauthorised third party comes into possession of this report they rely upon it at their peril and the authors owe them no duty of care and skill.

It is Fugro GeoServices Limited's understanding that this report is to be used for the purposes as described in the Specification for the investigation and as summarised in the text of the report. Should the purpose for which the report is used or the proposed use of the site change, this report may no longer be valid. Any further use or reliance upon the report in these circumstances by Dublin Port Company without further review by and advice from Fugro GeoServices Limited shall be at their sole and own risk.

B. DRAWINGS

Sampling Location Plans	Figures B.1 to B.5





GENERAL LOCATION PLAN SCALE:

0 0.325 0.65 Kilometres

PLAN SCALE:

0 230 460 920 Metres

Legend

- Sampling Locations

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2. Sheet size: A3
3. Coordinate system: British National Grid

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

CLIENT:	Dublin Port Company
PROJECT:	MP2 Marine Site Investigation - Sediment Quality
TITLE:	Sampling Location Plan
GIS BY: BAM	DATE: 03/12/2018
CHECKED BY: NHA	DATE: 12/12/2018
APPROVED BY: NHA	DATE: 12/12/2018
CONTRACT NO. G180021U:	FIGURE NO.: B.1

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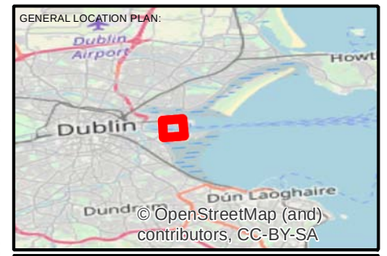

GENERAL LOCATION PLAN SCALE:

0 0.05 0.1 Kilometres

PLAN SCALE:

0 45 90 180 Metres

Legend

- Sampling Locations

Notes:
1. Inset map provided by ESRI UK
2. Sheet size: A3
3. Coordinate system: British National Grid

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

CLIENT:	Dublin Port Company
PROJECT:	MP2 Marine Site Investigation - Sediment Quality
TITLE:	Sampling Location Plan
GIS BY: BAM	DATE: 03/12/2018
CHECKED BY: NHA	DATE: 12/12/2018
APPROVED BY: NHA	DATE: 12/12/2018
CONTRACT NO.: G180021U	FIGURE NO.: B.2

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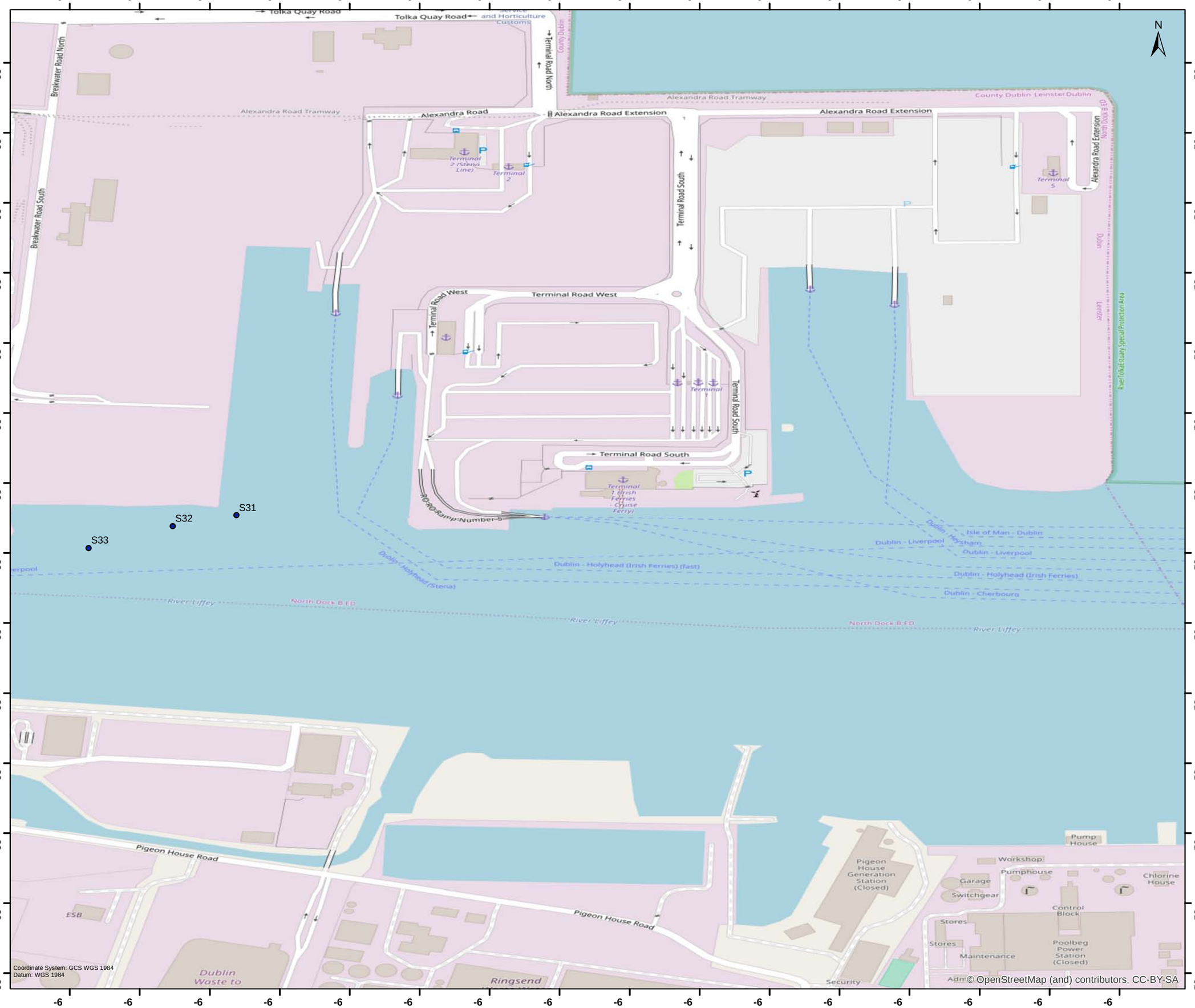

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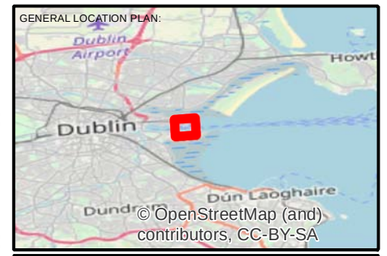

GENERAL LOCATION PLAN SCALE:

0 0.05 0.1 Kilometres

PLAN SCALE:

0 45 90 180 Metres

Legend

- Sampling Locations

Notes:
1. Inset map provided by ESRI UK
2. Sheet size: A3
3. Coordinate system: British National Grid

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

CLIENT: Dublin Port Company

PROJECT: MP2 Marine Site Investigation - Sediment Quality

TITLE: Sampling Location Plan

GIS BY: BAM	DATE: 03/12/2018
CHECKED BY: NHA	DATE: 12/12/2018
APPROVED BY: NHA	DATE: 12/12/2018
CONTRACT NO.: G180021U	FIGURE NO.: B.3

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River Tolka Estuary Special Protection Area

Alexandra Road Extension

North Dock B (2)

Dublin

Tanker

River Tolka Estuary Special Protection Area

S30 S21 S8 S11 S29 S27 S18 S9 S25 S17 S12 S6 S19 S7 S15 S14 S10 S13 S5 S4

Isle of Man - Dublin

Dublin - Liverpool

Dublin - Heysham

Dublin - Liverpool

Dublin - Holyhead (Irish Ferries) (fast)

Dublin - Holyhead (Irish Ferries)

Dublin - Holyhead (Stena)

Dublin - Cherbourg

North Bank Lighthouse

Pump House

Cooling Water Outfall

Great South Wall

Great South

Chlorine House

Control Room & Stores

Gas Turbines

Diesel Generator

Poolbeg Power Station

Poolbeg Tank Farm

Pigeon House Road

Pembroke East A ED

Coordinate System: GCS WGS 1984
Datum: WGS 1984

GENERAL LOCATION PLAN:

Dublin Airport

Howt

Dublin

Dún Laoghaire

Dundrum

GENERAL LOCATION PLAN SCALE:

0 0.05 0.1 Kilometres

PLAN SCALE:

0 45 90 180 Metres

Legend

Sampling Locations

Notes:
1. Inset map provided by ESRI UK
2. Sheet size: A3
3. Coordinate system: British National Grid

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

CLIENT: Dublin Port Company

PROJECT: MP2 Marine Site Investigation - Sediment Quality

TITLE: Sampling Location Plan

GIS BY: BAM	DATE 03/12/2018:
CHECKED BY: NHA	DATE: 12/12/2018
APPROVED BY: NHA	DATE: 12/12/2018
CONTRACT NO. G180021U:	FIGURE NO.: B.4

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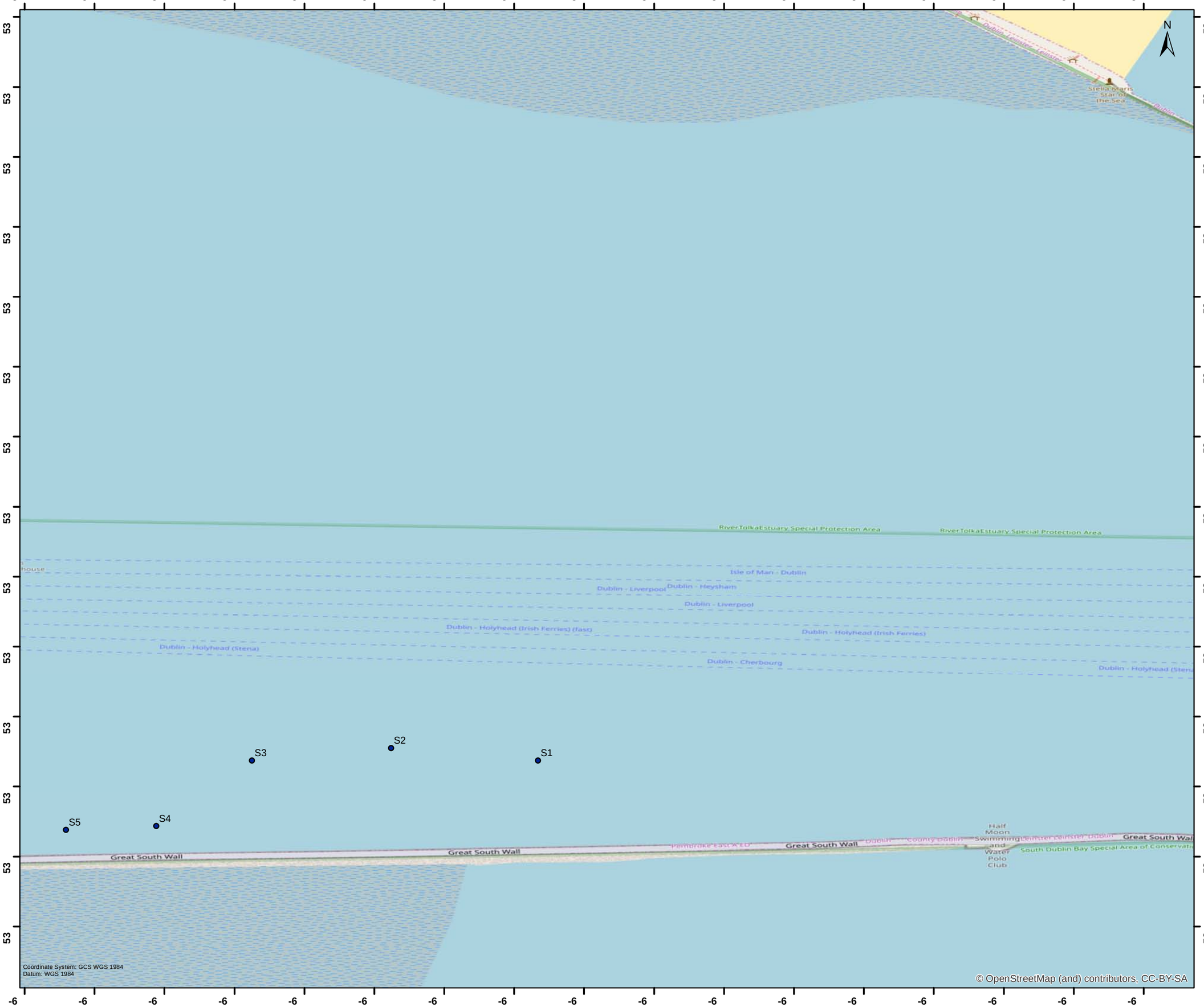

GENERAL LOCATION PLAN SCALE:

0 0.05 0.1 Kilometres

PLAN SCALE:

0 45 90 180 Metres

Legend

Sampling Locations

Notes:
1. Inset map provided by ESRI UK
2. Sheet size: A3
3. Coordinate system: British National Grid

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

CLIENT:	Dubin Port Company
PROJECT:	MP2 Marine Site Investigation - Sediment Quality
TITLE:	Sampling Location Plan
GIS BY: BAM	DATE: 03/12/2018
CHECKED BY: NHA	DATE: 12/12/2018
APPROVED BY: NHA	DATE: 12/12/2018
CONTRACT NO.: G180021U	FIGURE NO.: B.5

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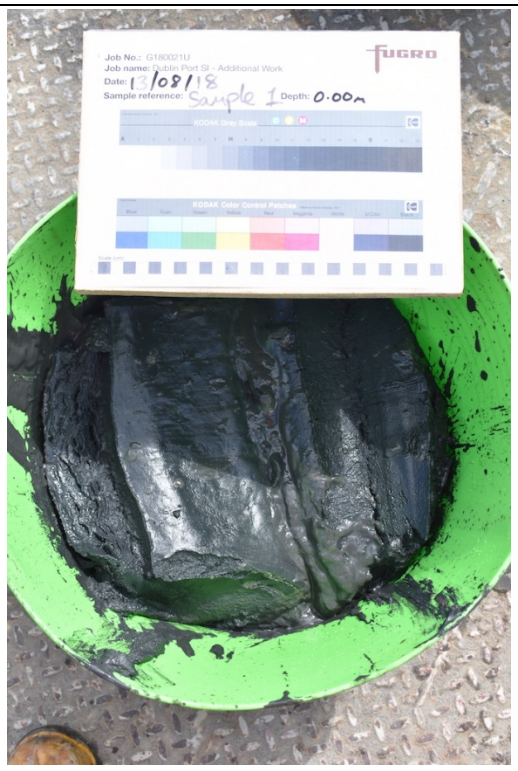
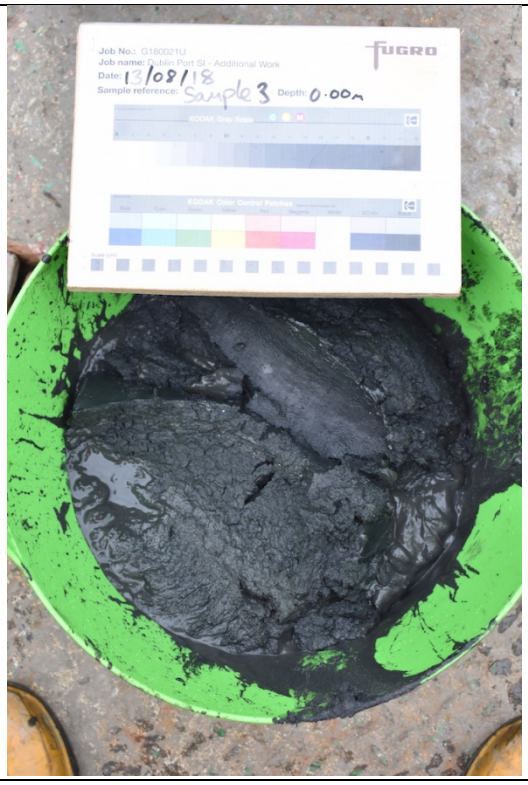
C. MATERIAL PHOTOGRAPHS

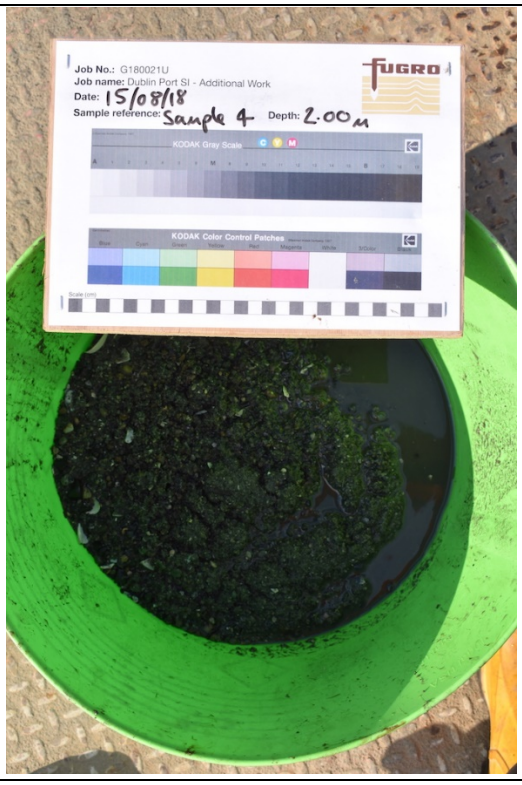
C.1 SAMPLE COLLECTION PHOTOGRAPHS

Sample Collection Photographs — Figures C.1.1 to C.1.34

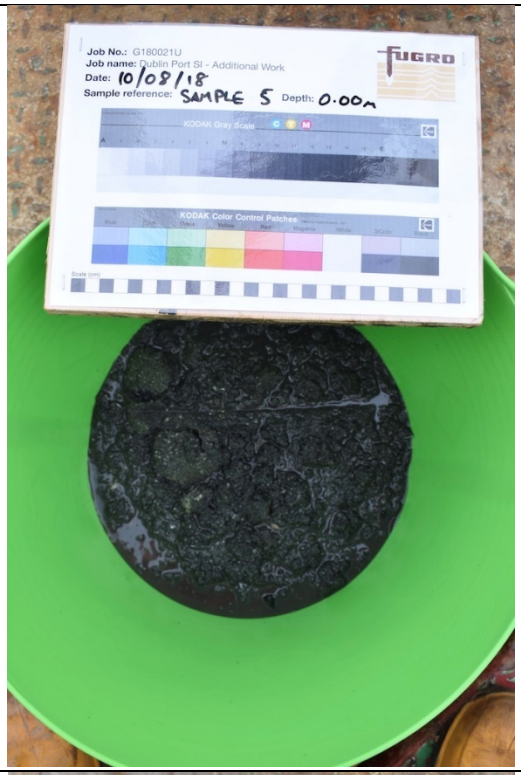
Figures C.1.1 to C.1.4; Samples 1, 2, 3, 4.

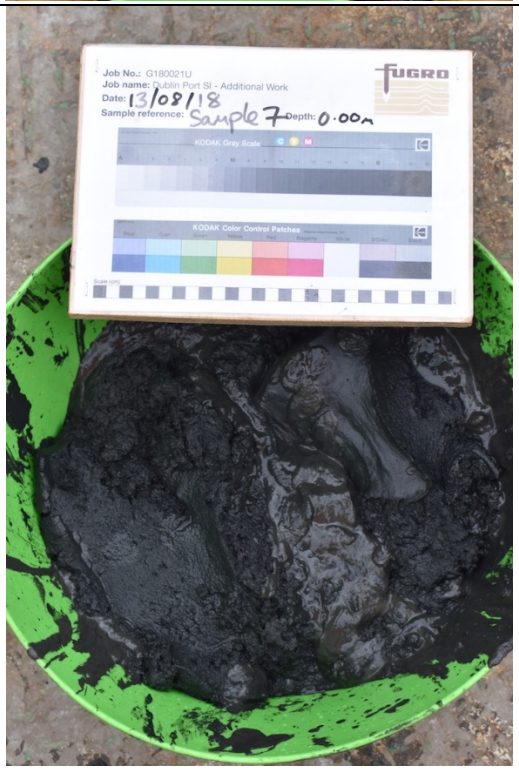




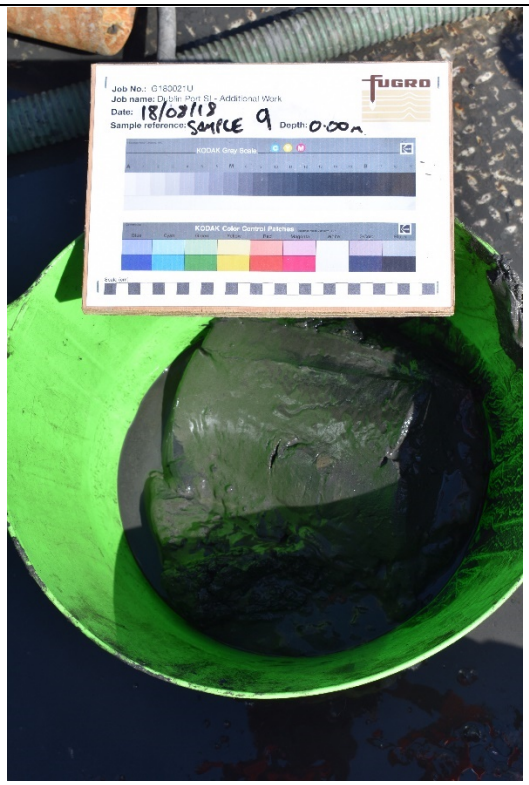


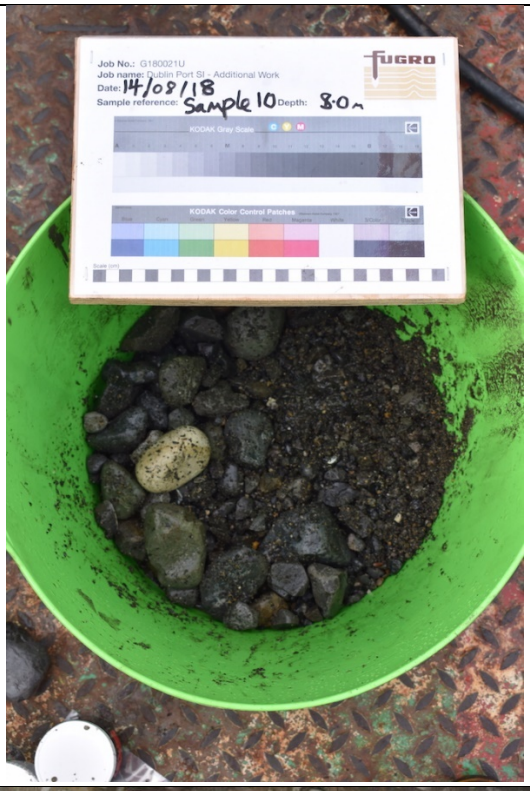
Figures C.1.5 to C.1.8; Samples 5, 6, 7, 8.

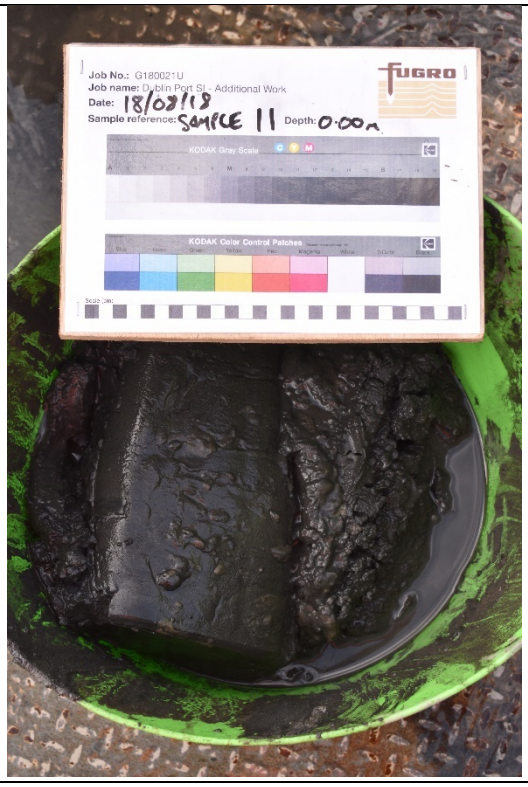




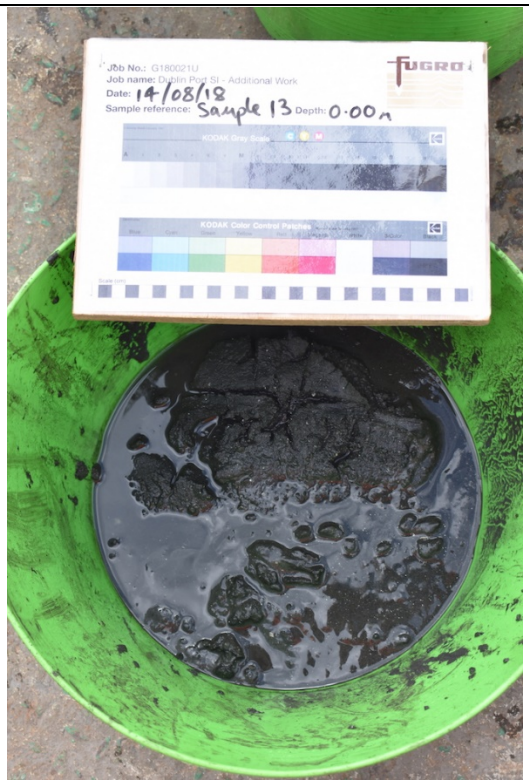
Figures C.1.9 to C.1.12; Samples 9, 10, 11, 12.

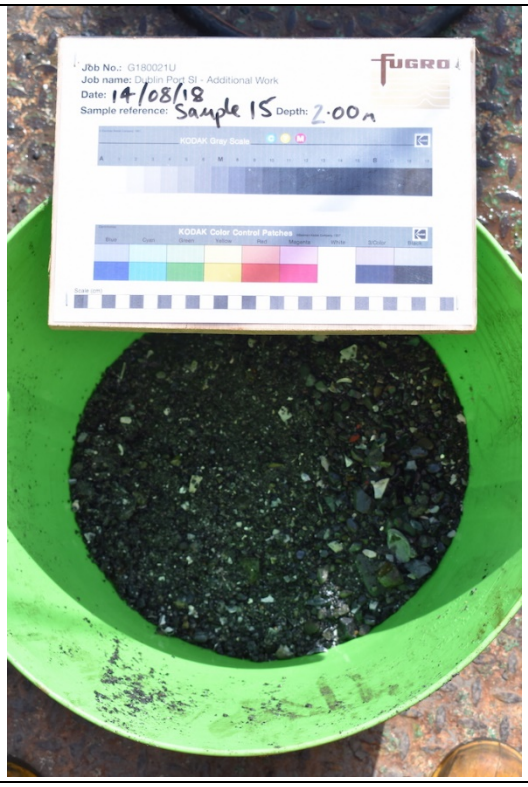




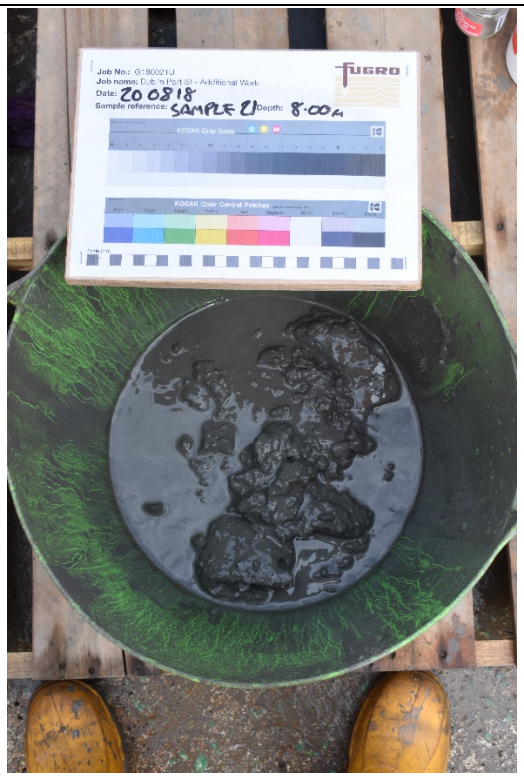


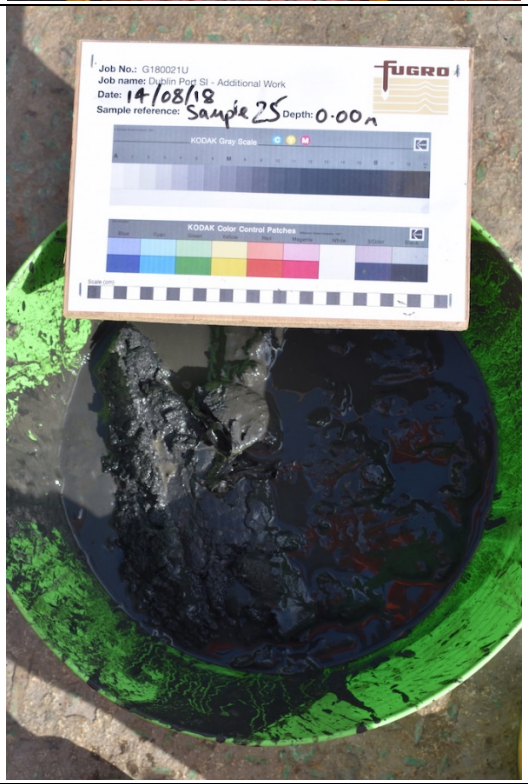
Figures C.1.13 to C.1.16; Samples 13, 14, 15, 18.



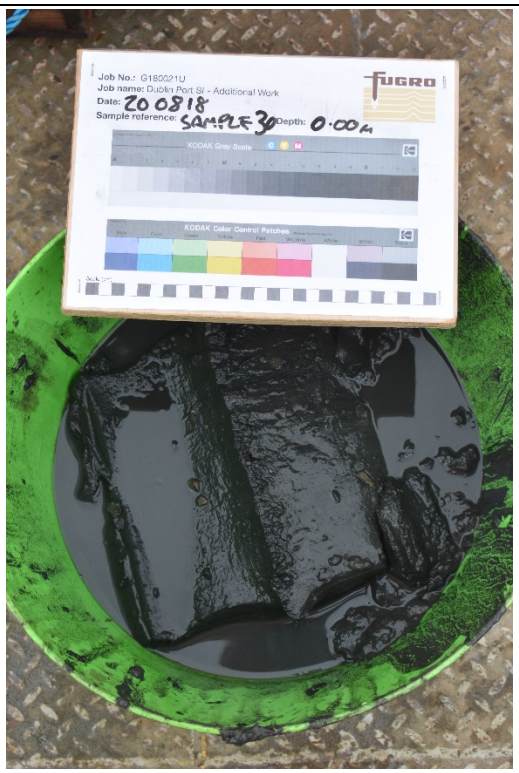


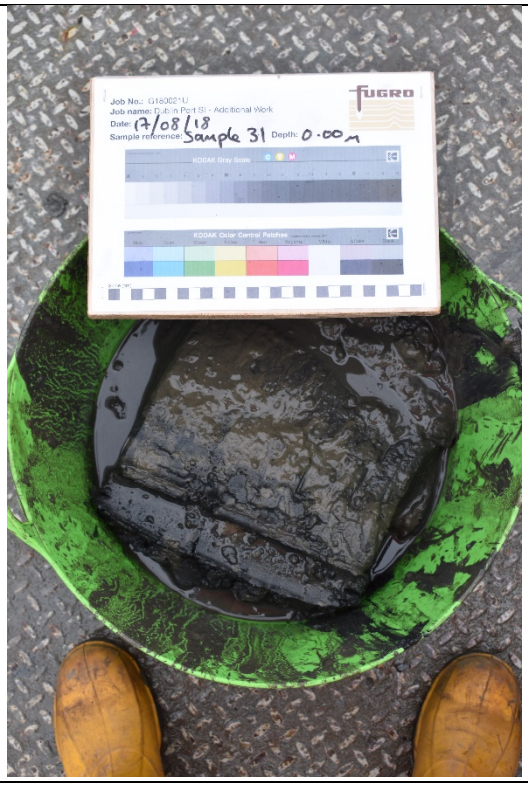
Figures C.1.17 to C.1.20; Samples 19, 21, 25, 27.

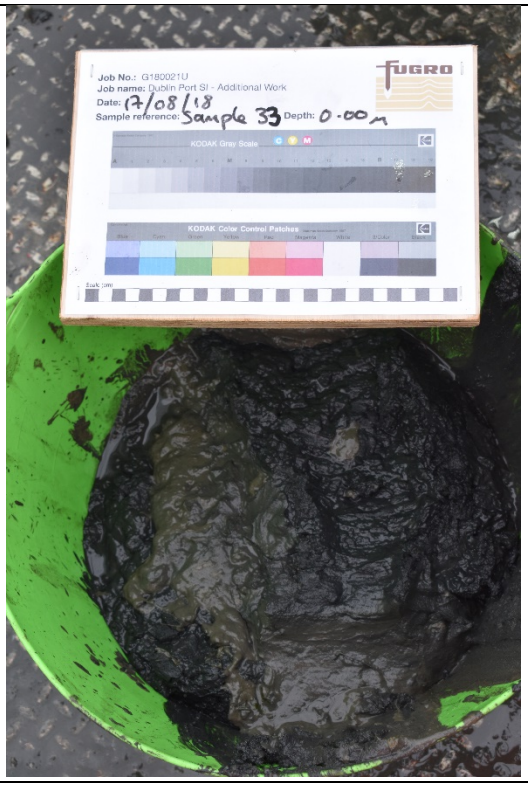




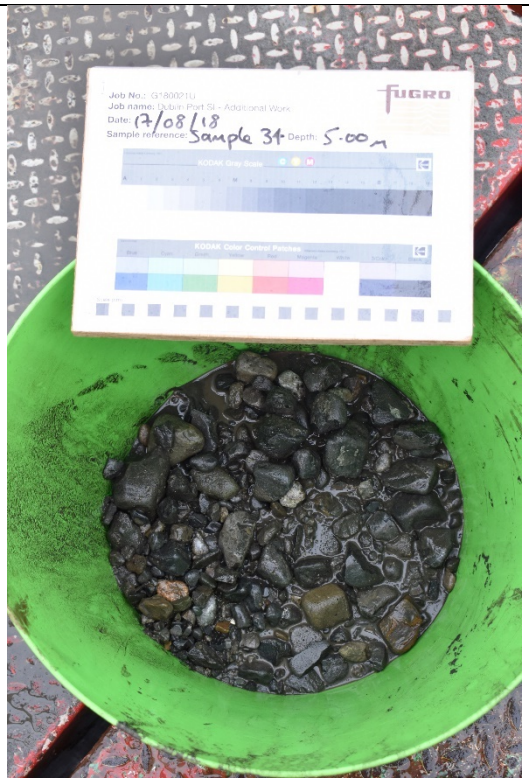
Figures C.1.21 to C.1.24; Samples 29, 30, 31, 33.

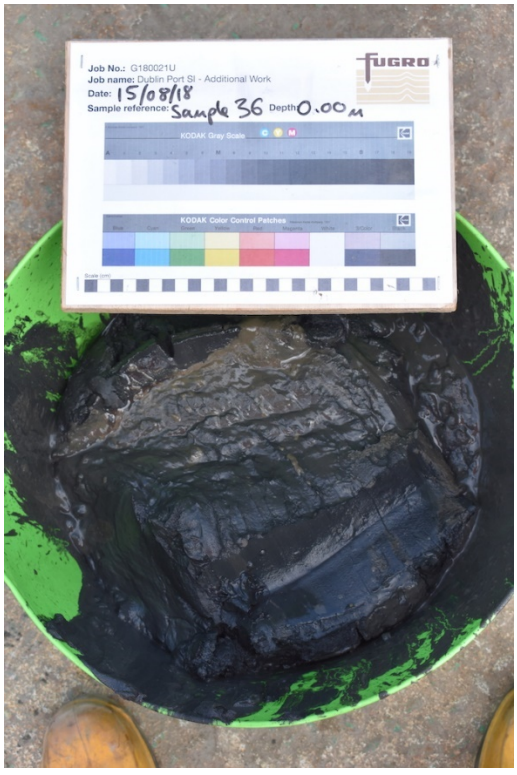




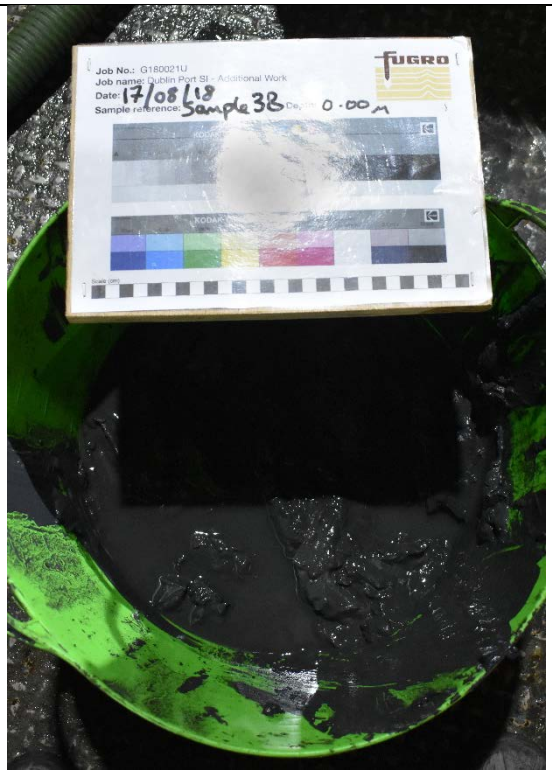


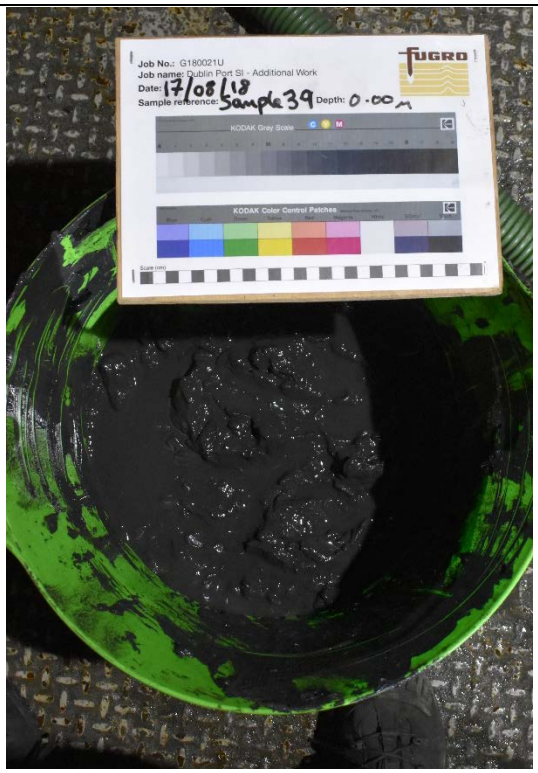
Figures C.1.25 to C.1.28; Samples 34, 35, 36, 37.

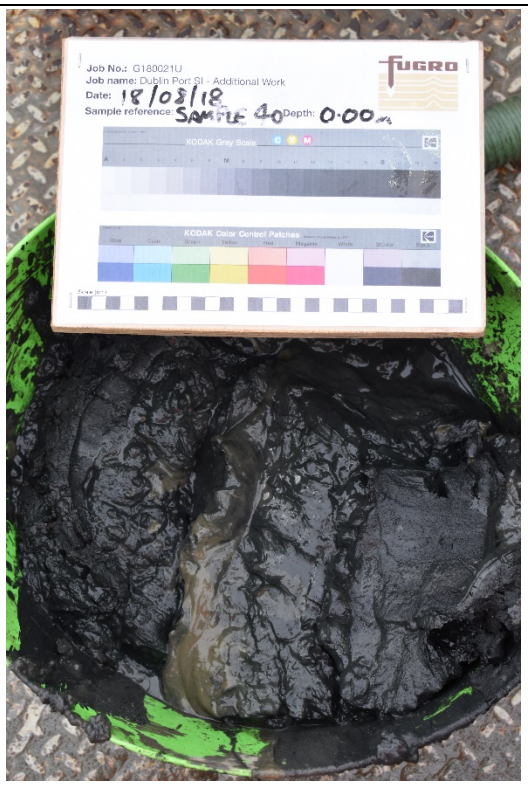




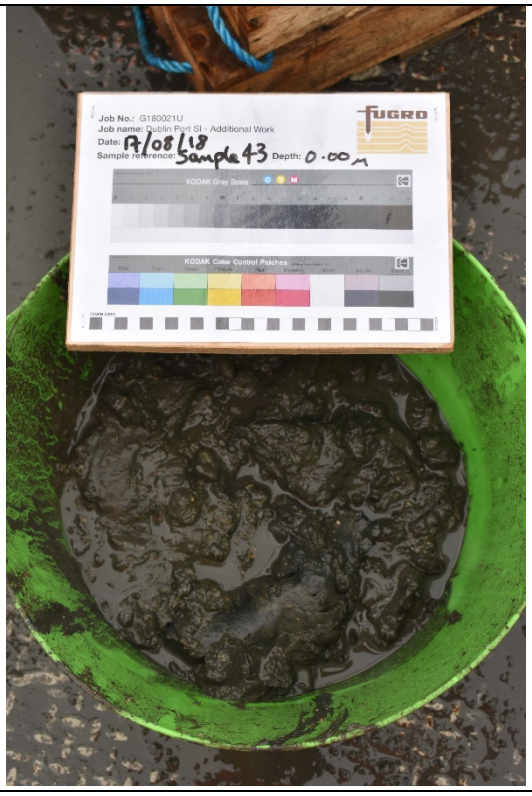
Figures C.1.29 to C.1.32; Samples 38, 39, 40, 41.







Figures C.1.33 and C.1.34; Samples 42, 43.



D. GEOENVIRONMENTAL TESTING

D.1 GENERAL NOTES ON GEOENVIRONMENTAL TESTING

D.2 CHEMICAL SEDIMENT ANALYSIS SCHEDULES PARAMETER CODES AND SUITES

D.3 CHEMICAL SEDIMENT SAMPLING RESULTS – EPA DAS PERMIT FORMAT

D.4 NATIONAL LABORATORY SERVICE CERTIFICATES OF ANALYSIS:

- 20124889 - 2
- 20124893 – 2
- 20126156 – 1
- 20127158 - 2

NOTES ON CHEMICAL ANALYSIS FOR CONTAMINATED LAND ASSESSMENT

1 SAMPLING, SAMPLE PRESERVATION, TRANSPORT AND STORAGE

Sampling of soils for environmental chemical analysis is undertaken to the standards set out in BS 10175:2011+A1:2013, sampling of groundwater is undertaken as per BS EN ISO 22475-1:2006 and BS ISO 5667-11:2009, sampling of surface waters as per BS EN ISO 5667-1:2006 and BS ISO 5667-6:2014, and sampling of ground gases for environmental testing as per CIRIA Guidance C665.

The sample container types used are dictated by the requirements of chemical testing as set out in the project specification and as provided by the selected environmental testing laboratory. Sample containers are filled as instructed by laboratory guidelines, ensuring minimisation of sample headspace.

Where sample volumes are limited by the sampling technique (e.g. dynamic sampling) certain sample container types may be prioritised to achieve the most comprehensive testing possible.

Samples on site are preserved by control of temperature to between 2 and 4 degrees Celsius unless otherwise stated. Samples are dispatched to the analytical laboratory on the day of sampling under Chain of Custody (CoC) in temperature controlled cool-boxes. Sample temperature is measured on receipt at the designated analytical laboratory. Temperature control is maintained at the analytical laboratory prior to receipt of testing instructions, preparation and analysis.

Where testing instructions are to be provided by the Engineer/Client blank testing schedules are provided as standard within 1 to 2 working days of sampling.

2 SCHEDULED TESTING

Table D.2.1 in Appendix D summarizes the requested chemical analyses scheduled on available samples. Where the requested analysis could not be undertaken this is reported and noted as 'No Determination Possible' (NDP) on Table D.2.1 and the reasons given.

The schedule lists the date of sampling, CoC number under which the samples were transported, tests requested and laboratory certificate reference for all samples.

Where many tests are undertaken, the schedule in Table D.2.1 may be grouped into test suites.
Figure D.2.2 provides the determinands tested in each suite.

3 LABORATORY ANALYTICAL METHODOLOGIES AND ACCREDITATION

Analytical laboratories used by FGSL are accredited by UKAS (United Kingdom Accreditation Service). Dependent on Limits of Detection being achievable as requested at the time of scheduling, chemical analyses on soils, waters and gases will, where possible, be accredited by MCERTS (Monitoring Certification Scheme). MCERTS is the Environment Agency's performance standard for laboratories undertaking chemical testing. The accreditation applicable for individual tests is presented on the analytical laboratory test certificates in this report.

A summary of the methodologies used by the analytical laboratory in carrying out the requested analyses is presented on the summary pages of the analytical laboratory test certificates. Further information may be obtained on the test methodologies by contacting the laboratory concerned.

Where marine sediment samples are tested, principally as part of a dredging license application, specific laboratory accreditation testing is required, as detailed in the relevant guidance documents from the licensing agency. Details of these tests are given in relevant guidance documents reproduced in the appendix with the results.

4 DEVIATING SAMPLES

UKAS is the accreditation body responsible for auditing laboratories to both ISO 17025 and MCERTS in the UK. All UKAS accredited laboratories are required to operate appropriate procedures for the handling of deviating samples.

Deviating (or non-conforming) samples are defined as those which may have been compromised in some way during sampling, transportation, storage or analysis, and which may cause the integrity of the analytical data to be in doubt.

Examples of deviating samples that can occur from sampling, transportation and storage issues include:

- Incorrect sample containers for analyses requested, for example, no separate volatile container supplied or samples for organics analysis supplied in plastic containers;
- Headspace present in containers for volatile compounds or Biological Oxygen Demand (BOD) analyses;
- No sampling date supplied (mandatory for MCERTS);
- No sampling time supplied (applicable for certain water parameters);
- Temperature exceeded;

- Holding time for the analysis exceeded.

Where deviating samples are subsequently analyzed, UKAS requires that the competent laboratory "shall include a disclaimer in the report, clearly stating that the sample was deviating and that, as a result, the test result(s) may be invalid". It is also a condition of MCERTS that the whole results certificate is included in reports sent to the Client, including all supporting information. and not just the results sheets. Each analytical report therefore contains a page detailing the deviating samples and the reasons for the non-conformity.

FGSL undertakes to sample, record, transport and store samples in such a way that deviating samples should not occur unless for reasons outside of FGSL's control.

5 WASTE ACCEPTANCE CRITERIA TESTING

Where samples have been scheduled for Waste Acceptance Criteria (WAC) testing to BS EN 12457, Part 3, analysis is undertaken for one of the Full, Hazardous or Inert WAC suites, as specified and as detailed below.

Full WAC Suite: The solid material from each sample is tested for: total organic carbon (TOC); loss on ignition (LOI); benzene, toluene, ethylbenzene and xylene (BTEX): Polychlorinated biphenyls (PCB's); Total petroleum hydrocarbons (TPH (C10 – C40)); Polycyclic aromatic hydrocarbons (PAHs); pH value; and acid neutralization capacity. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both are analyzed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids, phenol index and dissolved organic carbon.

Hazardous WAC Suite: The solid material from each sample is tested for total organic carbon, loss on ignition and acid neutralization capacity. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both are analyzed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids and dissolved organic carbon.

Inert WAC Suite: The solid material from each sample for total organic carbon, BTEX, PCB's, TPH (C10 – C40) and PAH. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both analyzed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids, phenol index and dissolved organic carbon.

Results - calculation

The results of the testing of the 2:1 and 8:1 leachate specimens are then calculated to give a liquid to solid ratio of 10:1 result in mg/kg. These 10:1 results, and the results of the solid determinations, can be compared to the values set out in the guidance produced by the Environment Agency (2005) to assist with appropriate disposal to landfill, under Landfill Directive (1999/31/EC).

6 CHEMICAL ANALYSIS ON LEACHATES PREPARED FROM SOIL SAMPLES

Where artificially produced leachate specimens are requested from soil samples the leachate preparation technique is in accordance with British Standard BS EN 12457, as detailed on the Schedule listed in Figure EC1.

The following is a summary of the different leaching preparations available:

- BS EN 12457-1: One stage test carried out at a liquid to solid ratio of 2:1;
- BS EN 12457-2: One stage test carried out at a liquid to solid ratio of 10:1;
- BS EN 12457-3: Two stage test carried out at a liquid to solid ratio of 2:1 followed by 8:1, giving a cumulative liquid to solid ratio of 10:1.

The resultant leachate specimens are then tested for the list of parameters shown in Figure EC1 and/or EC2.

7 AGS DATA FOR CHEMISTRY TESTING

Chemical testing results are provided in AGS 4.0 format where requested. It should be noted that where laboratory methodologies differ, or determinants tested do not appear on the AGS code list for chemical test names, a new and unique code may be used for an individual test.

REFERENCES

General References

BS 10175:2011+A1:2013 Investigation of potentially contaminated sites. Code of practice. British Standards Institute (BSI), March 2011. ISBN 978 0 580 68198 1.

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

Environment Agency (2005) Guidance on Sampling and Testing of Wastes to meet Landfill Waste Acceptance Procedures., Version 1. April 2005.

Leaching tests

BS EN 12457-1:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and with particle size below 4 mm (without or with size reduction). BSI, London (2002).

BS EN 12457-2:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction). BSI, London (2002).

BS EN 12457-3:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Two stage batch test at a liquid to solid ratio of 2 l/kg and 8 l/kg for materials with a high solid content and with a particle size below 4 mm (without or with size reduction). BSI, London (2002).

Guidance on Groundwater Sampling

BS EN ISO 22475-1. Geotechnical investigation and testing – sampling methods and groundwater measurements – Part 1: Technical principles for execution. BSI, Milton Keynes (2006).

BS ISO 5667-11:2009. Water Quality. Sampling. Guidance on sampling of groundwaters. BSI, Milton Keynes (2009).

Guidance on Sampling of Surface Waters/Rivers

BS EN ISO 5667-1:2006. Water quality. Sampling. Guidance on the design of sampling programmes and sampling techniques. BSI, Milton Keynes (2006).

BS ISO 5667-6:2014. Water quality. Sampling. Guidance on sampling of rivers and streams. BSI, Milton Keynes (2014).

Guidance on Sampling of Gases

Wilson, S. et al. (2007). Assessing risks posed by hazardous ground gases, C665, CIRIA, London.

Marine Sediments

See guidance documents from Centre for Environment Fisheries and Aquaculture Science (Cefas), Marine Scotland or Natural Resources Wales, as appropriate

Table D.2.1 Sediment sampling locations and analysis parameters

Sample	Depth	Area	Longitude (°W)	Latitude (°N)	Parameters for analysis	CoC Number	Results
1	0.00m	TC_South_surface	-6.16959	53.34220	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
2	2.00m	TC_South_deep	-6.17148	53.34236	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
3	0.00m	TC_South_surface	-6.17327	53.34220	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
4	2.00m	TC_South_deep	-6.17450	53.34136	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19107/19104	20127889_2 20124893-2
5	0.00m	TC_South_surface	-6.17566	53.34131	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
6	3.00m	TC_South_deep	-6.17683	53.34228	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
7	0.00m	TC_South_surface	-6.17726	53.34210	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108/19105	20127889_2
8	0.00m	TC_North_surface	-6.17780	53.34507	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
9	0.00m	TC_North_surface	-6.17830	53.34464	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
10	8.00m	TC_South_deep	-6.17831	53.34160	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
11	0.00m	TC_North_deep	-6.17867	53.34491	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19108/19104	20127889_2 20124893-2
12	2.00m	TC_South_deep	-6.17945	53.34248	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
13	0.00m	TC_South_surface	-6.17995	53.34139	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
14	0.00m	TC_South_surface	-6.17998	53.34193	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19107/19104	20127889_2 20124893-2
15	2.00m	TC_South_deep	-6.18095	53.34186	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
17	5.00m	TC_South_deep	-6.18224	53.34254	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
18	0.00m	TC_North_surface	-6.18246	53.34468	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108/19105	20127889_2
19	0.00m	TC_South_surface	-6.18279	53.34201	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
21	8.00m	TC_North_deep	-6.18326	53.34497	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
25	0.00m	TC_South_surface	-6.18364	53.34258	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
27	0.00m	TC_North_surface	-6.18437	53.34472	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19108/19104	20127889_2 20124893-2
29	0.00m	TC_North_deep	-6.18554	53.34478	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
30	0.00m	TC_North_surface	-6.18667	53.34519	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889_2
31	0.00m	Berth_50_deep	-6.20013	53.34505	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
32	0.00m	Berth_50_surface	-6.20095	53.34491	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889_2
33	0.00m	Berth_50_surface	-6.20203	53.34463	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107/19105	20127889_2

Sample	Depth	Area	Longitude (°W)	Latitude (°N)	Parameters for analysis	CoC Number	Results
34	5.00m	Berth_50_deep	-6.20410	53.34505	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889-2
35	5.00m	Berth_50_deep	-6.20500	53.34716	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19107/19104	20127889-2 20124893-2
36	0.00m	Berth_50_surface	-6.20549	53.34714	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889-2
37	0.00m	Berth_50_surface	-6.20523	53.34542	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j, 4k	19107/19105/ 19104	20127889-2 20124893-2
38	0.00m	Oil_Jetty_4	-6.20432	53.34708	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889-2
39	0.00m	Oil_Jetty_4	-6.20388	53.34710	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889-2
40	0.00m	Oil_Jetty_4	-6.20436	53.34622	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889-2
41	0.00m	Oil_Jetty_4	-6.20393	53.34620	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889-2
42	0.00m	Oil_Jetty_4	-6.20445	53.34539	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19108	20127889-2
43	0.00m	Oil_Jetty_4	-6.20401	53.34536	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4i, 4j	19107	20127889-2

KEY TO PARAMETER CODES

The parameter codes given in Table D.2.1 above correspond to the below testing suites.

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, total chromium, hexavalent chromium, nickel, lithium, aluminium.
    d. organochlorines HCH and Ɣ-HCH (Lindane), and PCBs (to be reported as the 7 individual CB congeners: 28, 52, 101, 118, 138, 153, 180).
    e. total extractable hydrocarbons and TPC-CWG including BTEX
    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.
    i. pH
    j. Asbestos Screen
    k. WAC Test as per BS 12457/2

**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.*

Instructions

As part of an application for a Dumping at Sea (DAS) Permit, sediment chemistry results must be submitted using this form. When completing this form, please ensure that you:

* Complete all worksheets in full - i.e. sheets "2. Project Info", "3. Results" and "4. QA".
* Report all results in the units specified (e.g. mg kg^{-1} versus μg kg^{-1}).
* Do not alter the format of this spreadsheet by changing units, by moving columns or by inserting new columns amongst the existing used columns.
* Insert additional rows as necessary at the end of the existing rows in sheet. "3 Results"
* Insert other determinants as necessary in the empty columns to the right in sheet. "3 Results".
* Any additional information should be included as inserted comments or in the Notes column in sheet. "3 Results".
* Provide a brief description of methodology used in sheet "2. Project Info".
* Enter the measured value (as well as the certified value) for Certified Reference material in sheet "4. QA"
* If in-house reference material is used, insert the measured value and the range normally achieved.
* Refer to the Dumping at Sea Application Form Guidance Note for further relevant information: http://www.epa.ie/downloads/forms/lic/das/name,30267,en.html

Key	
Location	Name of area e.g. Cork Harbour, Dublin Bay
CRMs	Certified reference materials used in analyses for metals, organics & TBT
Fraction analysed	Specify which fraction of sediment was analysed. < 2mm is requested, but some labs use < 63um
Analysing laboratory	Main laboratory where samples were sent to for analysis
Sub-contract lab	Sub-contracted laboratory where samples were sent by main laboratory
Sample ID code	Sample number assigned by sampler
Lab Report ID	Code assigned by analysing laboratory
Position (dd.ddd)	Give lat/long coordinates in decimal degrees (dd.dddd) of the position from where the sample was taken. List also the datum & projection.
Sampling depth (m)	The depth below the seabed surface at which the sample was collected.
<2mm	Grain size % < 2mm
<63um	Grain size % < 63mm
OC	Organic carbon (NOT organic matter)
Cd	Cadmium mg/kg
Hg	Mercury mg/kg
As	Arsenic **mg/kg**
Cr	Chromium mg/kg
Cu	Copper mg/kg
Pb	Lead mg/kg
Ni	Nickel mg/kg
Zn	Zinc mg/kg
TEH	Total extractable hydrocarbons g/kg
ΣPAH16	Sum of USEPA 16 PAH - acenaphthene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]flouranthene, benzo[a]pyrene, benzo[ghi]perylene, chrysene, dibenz(ah)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene,
ΣPCB7	Sum of the seven ICES polychlorinated biphenyls: PCB 028, PCB 052, PCB 101, PCB 138, BCB 153, PCB 180, PCB 118.
HCB	Hexachlorobenzene
γ-HCH	γ-Hexachlorocyclohexane (Lindane)
p,p' DDT	pp DDT ug/kg
p,p' DDD	pp DDD ug/kg
p,p' DDE	pp DDE mg/kg
TBT	TBT (mg/kg)
DBT	DBT (mg/kg)

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}	PCB 101 ug kg^{-1}	PCB 138 ug kg^{-1}	PCB 153 ug kg^{-1}
CRM (measured value)	MESS-4			30.5	142	0.218		19.5	19.7	77.7	39	62.3	54400							
CRM (measured value)	MESS-4			28.8	138	0.21		18.7	19.3	77.9	37.3	66.9	61500							
CRM (certified value)	MESS-4			32.9 +/- 1.8	147 +/- 6	0.28 +/- 0.14		21.5 +/- 1.2	21.7 +/- 2.8	94.3 +/- 1.8	42.8 +/- 1.6	65.3 +/- 6.8	79100+/- 200							
CRM (measured value)	1941B	5.2														3.23	3.87	3.88	3.68	4.3
CRM (measured value)	1941B	5.2														3.7	4.44	4.2	2.69	3.87
CRM (certified value)	1941B	2.99 +/- 0.24														4.52 +/- 0.57	5.24 +/- 0.28	5.11 +/- 0.34	3.60 +/- 0.28	5.47 +/- 0.32
CRM (measured value)	BCR-646													0.622	0.473					
CRM (measured value)	BCR-646													0.641	0.477					
CRM (certified value)	BCR-646													0.770 +/- 0.090	0.480 +/- 0.08					

Reference Type	Reference Material	PCB 180 ug kg^{-1}	PCB 118 ug kg^{-1}	PAH Acenaphthene ug kg^{-1}	PAH Acenaphthylene ug kg^{-1}	PAH Anthracene ug kg^{-1}	PAH Benzo (a) anthracene ug kg^{-1}	PAH Benzo (a) pyrene ug kg^{-1}	PAH Benzo (b) fluoranthene ug kg^{-1}	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	Notes / comments:
CRM (measured value)	MESS-4																			Report 20126156_1
CRM (measured value)	MESS-4																			Report 20126156_1
CRM (certified value)	MESS-4																			
CRM (measured value)	1941B	2.62	3.05	27.6	19.8	91.3	351	337	400	278	191	305	61.1	60.8	785	258	158	414	672	Report 20126156_1
CRM (measured value)	1941B	2.7	3.59	30.8	22.3	92.4	339	332	398	267	192	309	59.5	62.5	790	252	180	449	672	Report 20126156_1
CRM (certified value)	1941B	3.24 +/- 0.51	4.23 +/- 0.19	38.4 +/- 5.2	53.3 +/-6.4	184 +/- 18	335 +/- 25	358 +/- 17	453 +/- 21	307 +/- 45	225 +/- 18	291 +/- 31	53 +/- 10	85 +/- 15	651 +/- 50	341 +/- 57	848 +/- 95	406 +/- 44	581 +/- 39	
CRM (measured value)	BCR-646																			Report 20126156_1
CRM (measured value)	BCR-646																			Report 20126156_1
CRM (certified value)	BCR-646																			

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	PAH S 16 ug kg^{-1}	PCB S7 PCB ug kg^{-1}	HCB (kg dry wt)	g-HCH (ug kg-1 dry wt)	p,p' DDT (ug kg-1 dry wt)
Sample 31 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 31 0.00m	53.34505°N	6.20013°W	0	20124889_2	Grey Sandy Clay Sediment	46.2	0.09906	49.7132	50.065	1.85	12	53.8	31100	0.462	0.0471	12.2	50.3	28.6	37.1	29	121	0.1620	943.46	2.01		<0.1	<0.1
Sample 34 5.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 34 5.00m	53.34505°N	6.20410°W	5	20124889_2	Brown Sandy Clay Sediment, stones present	8.6	55.34	36.889	7.674	1.16	38	91.4	10600	1.88	0.0278	6.77	21.8	16.8	11.4	28	66.2	<0.05	65.36	0.00		<0.1	<0.1
Sample 33 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 33 0.00m	53.34463°N	6.20203°W	0	20124889_2	Grey Sandy Clay Sediment, stones present	44	0.0472	45.6255	54.377	1.79	18	56	24800	0.644	0.0535	9.3	44.6	31.9	33.2	26.4	116	0.536	1478.80	2.29		<0.1	<0.1
Sample 37 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 37 0.00m	53.34542°N	6.20523°W	0	20124889_2	Grey Sandy Clay Sediment, stones present	48.5	0.3286	35.1129	64.532	2.06	17	51.5	30800	0.771	0.117	12.2	49.2	36.7	45.4	28.7	152	0.324	2362.90	4.78		<0.1	<0.1
Sample 17 5.00m	Dublin Port Company	Dublin Port	12/08/2018	Sample 17 5.00m	53.34254°N	6.18224°W	5	20124889_2	Grey Sandy Clay Sediment, stones present	44	0.1553	42.2933	57.54	2.25	14	56	32600	0.531	0.104	11	54.3	30.3	63.3	29.6	152	0.498	2326.60	3.91		<0.1	<0.1
Sample 35 5.00m	Dublin Port Company	Dublin Port	15/08/2018	Sample 35 5.00m	53.34716°N	6.20498°W	5	20124889_2	Grey Clay Sediment, stones present	41	3.734	49.191	47.08	0.82	18	59	21200	0.312	0.0387	8.9	36.4	13.1	16.4	24.4	59.3	<0.08	639.77	0.10		<0.1	<0.1
Sample 36 0.00m	Dublin Port Company	Dublin Port	15/08/2018	Sample 36 0.00m	53.34714°N	6.20549°W	0	20124889_2	Grey Sandy Clay Sediment, stones present	49.9	0.05685	36.0956	63.857	2.08	18	50.1	27900	0.785	0.0971	12.2	46.8	36.3	45.2	28.4	153	0.508	2260.00	5.65		<0.1	<0.1
Sample 13 0.00m	Dublin Port Company	Dublin Port	14/08/2018	Sample 13 0.00m	53.34139°N	6.17995°W	0	20124889_2	Grey Sandy Clay Sediment, stones present	24.9	11.848	80.533	7.563	0.5	7.3	75.1	5110	0.166	0.116	4.93	13	10.7	58	7.7	50.2	<0.07	213.92	0.00		<0.1	<0.1
Sample 10 8.00m	Dublin Port Company	Dublin Port	14/08/2018	Sample 10 8.00m	53.34160°N	6.17831°W	8	20124889_2	Grey stones	7.8	87.88	6.53333	5.6757	1.33	48	92.2	7900	0.918	0.0192	7.43	20.1	9.08	12.1	21.4	48.2	<0.05	38.79	0.00		<0.1	<0.1
Sample 5 0.00m	Dublin Port Company	Dublin Port	10/08/2018	Sample 5 0.00m	53.34118°N	6.17568°W	0	20124889_2	Grey Sandy Clay Sediment, stones present	18.7	24.26	74.335	1.336	0.39	5.6	81.3	3390	0.168	5.32	5.11	10.1	8.52	23.4	7.7	43.1	<0.06	464.91	0.30		<0.1	<0.1
Sample 2 2.00m	Dublin Port Company	Dublin Port	13/08/2018	Sample 2 2.00m	53.34236°N	6.17148°W	2	20124889_2	Black Clay Sediment	42.7	0.0472	32.3903	67.58	1.68	15	57.3	23000	0.47	0.135	9.4	42.5	25.8	49.4	25.9	128	0.427	1893.30	3.35		<0.1	<0.1
Sample 1 0.00m	Dublin Port Company	Dublin Port	13/08/2018	Sample 1 0.00m	53.34220°N	6.16959°W	0	20124889_2	Black Clay Sediment	43.5	0.01914	47.05146	52.86	1.69	15	56.5	19000	0.282	0.0507	6.79	36.3	31.7	26.4	20.4	94.9	0.391	827.95	1.19		<0.1	<0.1
Sample 14 0.00m	Dublin Port Company	Dublin Port	12/08/2018	Sample 14 0.00m	53.34193°N	6.17998°W	0	20124889_2	Grey Sandy Clay Sediment	32.8	0.3473	83.844	15.7836	1.53	6.4	67.2	6100	0.19	0.0332	6.52	15.3	18.2	15.9	9.1	52	0.294	612.55	0.11		<0.1	<0.1
Sample 19 0.00m	Dublin Port Company	Dublin Port	12/08/2018	Sample 19 0.00m	53.34201°N	6.18279°W	0	20124889_2	Grey Sandy Clay Sediment	24	0.609	90.911	8.4147	0.43	5.9	76	4800	0.145	0.0394	4.46	<2	8.08	10.6	6.7	35.1	<0.06	337.29	0.00		<0.1	<0.1
Sample 12 2.00m	Dublin Port Company	Dublin Port	14/08/2018	Sample 12 2.00m	53.34248°N	6.17945°W	2	20124889_2	Grey Sandy Clay Sediment	44.2	0.02573	40.95469	59.06	1.9	15	55.8	25500	0.511	0.149	8.89	40.7	26.7	51.8	23.7	130	1.33	2500.40	4.39		<0.1	<0.1
Sample 32 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 32 0.00m	53.34491°N	6.20095°W	0	20124889_2	Grey Sandy Clay Sediment	44.4	0.0278	30.94639	69.03	1.82	17	55.6	24500	0.401	0.0541	10.2	48.1	27.8	36.6	27.8	114	0.237	1098.46	2.00		<0.1	<0.1
Sample 15 2.00m	Dublin Port Company	Dublin Port	14/08/2018	Sample 15 2.00m	53.34186°N	6.18095°W	2	20124889_2	Brown stones	0	45.53	49.791	4.582	0.2	10	100	2180	0.127	<0.01	8.78	9.37	3.96	10.6	5.8	21.1	<0.05	85.46	0.38		<0.1	<0.1
Sample 25 0.00m	Dublin Port Company	Dublin Port	14/08/2018	Sample 25 0.00m	53.34258°N	6.18364°W	0	20124889_2	Grey Clay Sediment	38.4	0.0248	52.654	47.27	1.25	12	61.6	14200	0.27	0.0394	6.39	27.1	21.3	22.5	15.9	75.9	0.224	892.02	1.08		<0.1	<0.1
Sample 43 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 43 0.00m	53.34536°N	6.20401°W	0	20124889_2	Grey Sandy Clay Sediment	37.3	5.7503	42.67	51.574	2.08	21	62.7	17200	0.884	0.0666	13.1	33.5	21.1	28	24.8	84.1	0.231	1861.50	1.85		<0.1	<0.1
Sample 4 2.00m	Dublin Port Company	Dublin Port	15/08/2018	Sample 4 2.00m	53.34136°N	6.17450°W	2	20124889_2	Grey Sandy Clay Sediment, stones and shells present	13.9	58.26	39.595	2.1292	0.14	6.7	86.1	3750	0.125	<0.01	7.07	16.2	6.40	7.89	11.1	29.6	<0.06	34.65	0.00		<0.1	<0.1
Sample 3 0.00m	Dublin Port Company	Dublin Port	13/08/2018	Sample 3 0.00m	53.34220°N	6.17327°W	0	20124889_2	Brown Clay Sediment, stones and shells present	40.3	0.08802	23.0581	76.85	1.81	15	59.7	23800	0.326	0.0513	7.16	41.6	31.9	31.4	23.4	111	0.341	936.18	1.55		<0.1	<0.1
Sample 6 3.00m	Dublin Port Company	Dublin Port	13/08/2018	Sample 6 3.00m	53.34228°N	6.17683°W	3	20124889_2	Brown Clay Sediment	41.9	0.09266	24.24651	75.66	2.55	14	58.1	25300	0.831	0.197	9.69	53.7	41.6	74.3	31.9	183	1.45	3647.60	7.08		<0.1	0.12
Sample 41 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 41 0.00m	53.34620°N	6.20393°W	0	20124889_2	Brown Clay Sediment, plant and stones present	48.6	2.7434	20.199	77.04	2.07	17	51.4	25800	0.774	0.0962	11.6	47.8	41.5	52.8	28.6	179	0.559	13268.70	4.70		<0.1	<0.1
Sample 7 0.00m	Dublin Port Company	Dublin Port	13/08/2018	Sample 7 0.00m	53.34210°N	6.17725°W	0	20124889_2	Brown Clay Sediment, Plant material present	61.8	0.02466	42.70616	57.27	4.33	14	38.2	22800	0.644	0.0828	12.6	45.4	88.2	42.9	26.1	193	0.858	1115.53	2.02		<0.1	<0.1
Sample 39 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 39 0.00m	53.34710°N	6.20388°W	0	20124889_2	Brown Clay Sediment, Plant material present	54.3	0.716	26.0113	73.284	2.4	16	45.7	28200	0.739	0.0734	11.9	48.5	46.3	48.5	28.1	179	0.517	2090.30	4.28		<0.1	<0.1
Sample 38 0.00m	Dublin Port Company	Dublin Port	17/08/2018	Sample 38 0.00m	53.34708°N	6.20432°W	0	20124889_2	Brown Clay Sediment, Plant material present	49.3	0.20117	19.6975	80.11	2.03	17	50.7	30100	0.727	0.0772	12.1	52	40.3	47.2	29.9	170	0.458	3480.90	11.51		<0.1	0.151
Sample 40 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 40 0.00m	53.34622°N	6.20436°W	0	20124889_2	Brown Clay Sediment, Plant and stones present	51.7	4.5958	29.41148	66.001	2.1	17	48.3	30300	1.02	0.103	13.2	53.2	46.1	85.7	31.2	197	1.11	1728.60	4.08		<0.1	<0.1
Sample 42 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 42 0.00m	53.34539°N	6.20445°W	0	20124889_2	Brown Clay Sediment, Plant material present	50.8	0.01012	19.19	80.79	1.92	17	49.2	27500	0.642	0.0745	11.4	47.1	34.6	44.6	27.8	143	0.32	1157.34	1.03		<0.1	<0.1
Sample 27 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 27 0.00m	53.34472°N	6.18437°W	0	20124889_2	Brown Clay Sediment, Plant and stones present	40.5	0.01213	19.6582	80.37	1.15	13	59.5	18800	0.249	0.0362	6.54	33.5	19.1	25.2	19.0	82.9	0.118	589.44	1.00		<0.1	<0.1
Sample 18 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 18 0.00m	53.34468°N	6.18246°W	0	20124889_2	Brown Clay Sediment, Plant material present	68.1	0.06097	12.03275	87.96	1.17	14	31.9	18800	0.218	0.0315	6.38	32.4	18	23.2	18.0	74.2	0.236	729.64	0.70		<0.1	<0.1
Sample 9 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 9 0.00m	53.34464°N	6.17830°W	0	20124889_2	Brown Clay Sediment, Plant material present	55.2	0	18.9786	81.03	0.94	18	44.8	14200	0.193	0.0363	5.52	27.8	15	18.8	15.0	61	0.192	498.65	0.38		<0.1	<0.1
Sample 8 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 8 0.00m	53.34507°N	6.17780°W	0	20124889_2	Brown Clay Sediment, Plant material present	40	0.00362	42.66085	57.42	1.33	13	60	25000	0.192	0.0433	5.8	38.3	19.4	22.2	18.8	77.2	0.164	940.97	0.68		<0.1	<0.1
Sample 11 0.00m	Dublin Port Company	Dublin Port	18/08/2018	Sample 11 0.00m	53.34491°N	6.17867°W	0	20124889_2	Brown Clay Sediment, Plant material present	36.4	0.00733	17.80734	82.18	1.11	13	63.6	20400	0.178	0.0402	6.35	34	16.3	20.2	16.9	67.1	0.149	604.76	0.29		<0.1	<0.1
Sample 29 0.00m	Dublin Port Company	Dublin Port	19/08/2018	Sample 29 0.00m	53.34478°N	6.18554°W	0	20124889_2	Brown Clay Sediment	42.3	0.01865	11.8325	88.27	1.4	16	57.7	27200	0.262	0.0525	7.79	41	20	27.7	20.4	90.9	0.199	1493.90	2.85		<0.1	<0.1
Sample 21 8.00m	Dublin Port Company	Dublin Port	20/08/2018	Sample 21 8.00m	53.34497°N	6.18326°W	8	20124889_2	Brown Clay Sediment, Stones and Shells present	32	0.3955	49.20809	50.35	0.71	15	68	20100	0.3	0.0142	8.78	31.8	8.2	10.2	19.4	45.4	<0.07	23.23	0.00		<0.1	<0.1
Sample 30 0.00m	Dublin Port Company	Dublin Port	20/08/2018	Sample 30 0.00m	53.34519°N	6.18667°W	0	20124889_2	Brown Clay Sediment, Plant material present	48	0.0549	27.52266	72.48	1.99	15	52	18900	0.256	0.0651	2.91	17.8	23.6	25.6	61.8	94.7	0.28	1192.58	1.80		<0.1	<0.1

Sample ID code	p,p' DDD (ug kg-1 dry wt)	p,p' DDE (mg kg-1 dry wt)	Σ DDX (ug kg-1 dry wt)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}	PCB 101 ug kg^{-1}	PCB 138 ug kg^{-1}	PCB 153 ug kg^{-1}	PCB 180 ug kg^{-1}	PCB 118 ug kg^{-1}	PAH Acenaphthene ug kg^{-1}	PAH Acenaphthylene ug kg^{-1}	PAH Anthracene ug kg^{-1}	PAH Benzo (a) anthracene ug kg^{-1}	PAH Benzo (a) pyrene ug kg^{-1}	PAH Benzo (b) fluoranthene ug kg^{-1}	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	Li mg kg^{-1}	Cr VI mg kg^{-1}
Sample 31 0.00m	0.326	0.000246	0.572	0.00307	<0.005	0.472	0.209	0.230	0.308	0.295	0.164	0.334	8.85	6.91	21.2	67.4	84.1	105	82.5	51.0	56.1	17.7	19.7	110	81.6	34.3	88.1	109	42.7	<0.6
Sample 34 5.00m	<0.1	<0.0001	<0.1	<0.001	<0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2	<2	<2	<2	<2	9.59	5.56	<2	7.84	<2	<10	3.39	<2	<10	33.40	5.58	8.91	<0.6
Sample 33 0.00m	0.522	0.000329	0.851	0.00895	<0.005	0.693	0.305	0.235	0.241	0.289	0.190	0.334	11.3	15.2	44.9	123	142	142	115	74.9	101	27.0	25.6	186	109	39.9	125	197	32.9	<0.6
Sample 37 0.00m	0.995	0.000611	1.606	0.0151	<0.006	1.530	0.628	0.518	0.517	0.566	0.383	0.635	17.2	26.8	64.8	202	253	241	200	128	147	46.4	33.9	283	191	52.8	153	323	41.0	<0.6
Sample 17 5.00m	0.666	0.00063	1.296	0.00896	<0.03	0.916	0.395	0.446	0.527	0.596	0.404	0.628	19.4	21.5	54.5	184	224	255	205	127	145	45.3	40.2	265	205	69.7	158	308	45.8	<0.6
Sample 35 5.00m	0.353	0.000135	0.488	<0.002	<0.02	0.103	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3.92	7.15	24.9	66.9	65.2	59.2	44.4	30.3	57.4	11.0	<10	85.3	39.9	<10	37.2	107	28.0	<0.6
Sample 36 0.00m	1.21	0.000607	1.817	0.0294	<0.006	1.830	0.759	0.588	0.599	0.667	0.508	0.700	17.4	29.8	65.2	177	244	241	209	122	127	45.6	35.2	239	195	56.80	151	305	37.6	<0.6
Sample 13 0.00m	0.107	<0.0001	0.107	<0.001	<0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2	2.43	5.90	15.9	29.5	25.7	20.8	14.1	11.5	4.99	<10	19.0	20.2	<10	12.5	31.4	11.6	<0.6
Sample 10 8.00m	<0.1	<0.0001	<0.1	<0.001	<0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2	<2	<2	<2	2.25	8.32	5.64	<2	<7	<2	<10	3.31	<2	<10	15.0	4.27	8.31	<0.6
Sample 5 0.00m	0.143	<0.0001	0.143	0.00137	<0.004	0.194	0.108	<0.1	<0.1	<0.1	<0.1	<0.1	<3	3.28	5.71	25.5	54.8	50.6	36.7	28.7	28.2	8.52	<10	56.4	36.8	<10	42.7	87.0	9.21	<0.6
Sample 2 2.00m	0.545	0.629	1.174	0.0128	0.00531	0.910	0.406	0.374	0.403	0.493	0.329	0.435	16.5	18.9	45.5	157	184	204	164	106	112	30.5	31.2	213	159	57.7	138	256	37.0	<0.6
Sample 1 0.00m	0.196	0.223	0.419	0.00256	<0.005	0.272	0.226	0.126	0.144	0.163	0.106	0.154	12.8	6.25	18.3	59.9	71.8	82.5	66.2	40.4	51.6	13.8	16.9	106	61.6	23.7	87.2	109	27.3	<0.6
Sample 14 0.00m	0.114	0.111	0.225	0.00156	<0.004	<0.1	0.1110	<0.1	<0.1	<0.1	<0.1	<0.1	2.10	5.18	8.73	59.9	78.5	67.3	57.8	38.4	47.1	12.4	<5	68.9	52.6	6.94	24.0	82.7	11.9	<0.6
Sample 19 0.00m	<0.1	<0.0001	<0.1	<0.001	<0.004	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.32	2.48	7.12	31.2	38.4	33.8	25.5	19.3	23.5	5.77	<5	50.3	25.0	<5	20.7	52.9	7.47	<0.6
Sample 12 2.00m	0.823	0.000876	1.699	0.0456	<0.03	1.150	0.505	0.493	0.528	0.681	0.449	0.581	21.5	25.5	65.0	208	247	262	211	137	160	47.8	45.0	289	203	76.6	168	334	33.1	<0.6
Sample 32 0.00m	0.311	0.00025	0.561	0.00554	<0.005	0.449	0.216	0.203	0.258	0.326	0.333	0.211	9.36	10.6	26.3	82.9	103	117	94.3	58.7	69.4	20.8	20.8	127	90.5	38.5	94.3	135	39.2	<0.6
Sample 15 2.00m	0.435	0.000354	0.789	<0.001	<0.003	0.260	0.119	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	2.76	6.78	7.45	7.78	4.05	3.96	5.50	<1	<5	16.6	3.73	<5	6.95	19.9	4.03	<0.6
Sample 25 0.00m	0.218	0.000191	0.409	0.00247	<0.005	0.250	0.176	0.120	0.143	0.154	0.107	0.128	7.68	7.94	25.2	69.6	86.8	85.7	67.3	45.2	52.1	14.8	15.5	109	63.9	27.6	77.7	136	23.9	<0.6
Sample 43 0.00m	0.508	0.00028	0.788	0.00534	<0.005	0.649	0.319	0.196	0.176	0.201	0.154	0.157	18.2	22.7	62.8	140.0	199.0	187.0	142.0	99.1	101	33.2	28.8	194	130	42.7	126	335	23.9	<0.6
Sample 4 2.00m	<0.1	<0.0001	<0.1	<0.001	<0.003	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	2.85	3.25	3.32	1.86	1.76	<3	<1	<5	6.55	1.63	<5	5.72	7.71	9.91	<0.6
Sample 3 0.00m	0.407	0.000265	0.672	<0.002	<0.005	0.383	0.254	0.181	0.196	0.202	0.133	0.198	7.88	9.2	22.4	70.0	92.8	101	79.7	51.1	54.8	17.2	17.0	109	75.1	30.4	75.6	123	31.7	<0.6
Sample 6 3.00m	1.22	0.00152	2.86	0.0368	<0.03	1.840	0.761	0.793	0.931	1.100	0.758	0.898	28.3	46.2	82.3	331	367	381	310	203	278	69.0	58.7	454	285	89.1	198	467	39.2	<0.6
Sample 41 0.00m	0.95	0.000642	1.592	0.0358	<0.03	1.450	0.610	0.502	0.542	0.606	0.406	0.581	521	29.7	398	872	900	828	614	379	785	129	422	2050	516	235	2650	1940	39.0	<0.6
Sample 7 0.00m	0.366	0.000558	0.924	0.00514	<0.04	0.397	0.572	0.188	0.214	0.271	0.192	0.186	7.13	13.1	20.2	90.7	118.0	122.0	111.0	64.6	74.3	22.7	16.8	118	93.2	31.2	72.6	140	34.6	<0.6
Sample 39 0.00m	0.902	0.000614	1.516	0.0146	<0.03	1.380	0.577	0.448	0.488	0.562	0.404	0.423	15.2	24.6	55.5	181	229	220	195	117	122	43.9	30.9	222	173	57.2	129	275	37.9	<0.6
Sample 38 0.00m	2.18	0.00161	3.941	0.014	<0.006	4.220	1.920	1.070	1.040	1.240	0.944	1.080	21.9	40.6	103	320	410	373	318	202	197	71.50	44.40	340	280	80.5	180	499	42.7	<0.6
Sample 40 0.00m	0.793	0.000594	1.387	0.049	<0.03	1.330	0.577	0.417	0.443	0.503	0.337	0.474	13.5	22	48.7	145	182	184	162	96.6	94.6	35.8	28.9	181	146	51.5	111	226	42.4	<0.6
Sample 42 0.00m	0.195	0.00016	0.355	0.00856	<0.006	0.261	0.122	0.108	0.137	0.155	0.119	0.132	15	4.94	31.0	89.7	96.3	103	85.1	52.1	70.8	17.7	21.6	168	75.9	28.2	135	163	40.6	<0.6
Sample 27 0.00m	0.158	0.000139	0.297	<0.002	<0.005	0.213	0.115	0.126	0.150	0.161	0.118	0.121	4.61	3.83	13.1	43.8	55.1	65.0	54.5	31.9	33.8	11.4	11.1	67.6	50.1	22	50.7	70.9	30.0	<0.6
Sample 18 0.00m	0.157	0.00014	0.297	<0.003	<0.009	0.233	0.117	<0.1	0.119	0.128	<0.1	0.104	7.38	4.86	15.6	52.5	66.2	72.8	61.5	36.6	43.1	13.1	13.4	91.4	57	23.8	74.2	96.2	26.4	<0.6
Sample 9 0.00m	0.123	0.000104	0.227	0.00255	<0.007	0.257	0.121	<0.1	<0.1	<0.1	<0.1	<0.1	3.88	3.59	13.9	39.8	45.6	49.5	40.4	25.4	30.4	8.7	7.7	64.1	37.2	13.1	46.4	69	22.0	<0.6
Sample 8 0.00m	0.153	0.000152	0.305	<0.002	<0.005	0.207	0.128	<0.1	0.111	0.125	<0.1	0.111	9.08	4.29	27.5	74.0	79.4	86.0	70.2	44.0	57.9	15.3	16.3	137	66.7	23.3	102	128	30.0	<0.6
Sample 11 0.00m	0.119	0.000116	0.235	<0.002	<0.005	0.179	<0.1	<0.1	<0.1	0.108	<0.1	<0.1	5.54	3.42	13.4	42.3	50.2	61.8	47.6	30.3	36.6	10.2	11.9	79.4	44.3	22.3	69.2	76.3	25.0	<0.6
Sample 29 0.00m	0.495	0.000399	0.894	0.0022	<0.005	0.763	0.346	0.289	0.354	0.417	0.413	0.267	13.5	13.8	39.8	123	148	153	131	78.1	88.8	27.6	26.5	175	117	45.8	119	194	35.8	<0.6
Sample 21 8.00m	<0.1	<0.0001	<0.1	<0.001	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	1.19	1.00	<1	4.25	3.02	<1	<3	<1	<5	2.13	1.1	<5	8.11	2.43	23.9	<0.6
Sample 30 0.00m	0.303	0.000287	0.59	0.0071	<0.03	0.382	0.247	0.223	0.247	0.272	0.212	0.216	14.2	6.68	27.9	89.6	102	117	97.9	58.8	69.7	20.5	21.1	162	87.7	33.5	124	160	32.2	<0.6

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Karen Blackmore
Fugro GeoServices Ltd
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Dear Karen

Please find attached the results for the batch of 36 samples described below.

Samples Registered on:	29-Aug-2018
Analysis Started on:	17-Aug-2018
Analysis Completed on:	15-Oct-2018
Results for Batch Number	20124889
Your Purchase Order Number:	70138KB-WAL

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

Lawrence Green
Customer Services Team Manager
Tel: 0800 092 0786
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206263

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 31 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0149	mg/kg			None	NLS	864
pH : Solid sample	8.68	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.85	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0471	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	31100	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	12.2	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.462	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	50.3	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	28.6	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	37.1	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	42.7	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	29.1	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	121	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248

Grain Size Fraction : <1000 microns : {>0 phi}	99.7	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.111	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0872	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0555	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0396	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00396	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.03	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0623	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0419	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0892	mm	0	UKAS	LE	1368
Kurtosis	0.901	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.536	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.399	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.927	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.828	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.15	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.87	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.09	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.75	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.32	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	4.53	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	4.50	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	4.94	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.34	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	6.15	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.67	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	12.6	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	14.8	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	12.0	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.32	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.22	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.788	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.568	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.219	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.297	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	8.85	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	6.91	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	21.2	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	67.4	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	84.1	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	105	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	82.5	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	51.0	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	56.1	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	17.7	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	110	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	19.7	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	81.6	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	34.3	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	88.1	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	109	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.472	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.209	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.230	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.334	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.308	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.295	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.164	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<90	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	162	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	104	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	140	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	143	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	123	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	104	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	108	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<70	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<40	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg	3	None	LE	897
		ELEVATED_MRV : Dry weight calculation				
Tributyl Tin : Dry Wt as Cation	3.07	ug/kg	1	None	LE	897

Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.6	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	53.8	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							

Drying Method		Report	Text			None	LE	924
	Air dried at 30°C							
Rejected Matter Description		Report	Text			None	LE	924
	No material removed							
Sample Colour		Report	Text			None	LE	924
	Grey							
Sample Matrix		Report	Text			None	LE	924
	Sandy Clay Sediment							
Sample Preparation		Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight		12	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt		<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206264

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 34 5.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00750	mg/kg			None	NLS	864
pH : Solid sample	8.88	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.16	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0278	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	10600	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.77	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	1.88	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	21.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	16.8	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	11.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	8.91	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	27.6	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	66.2	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248

Grain Size Fraction : <1000 microns : {>0 phi}	41.6	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.869	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	2.09	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	1.33	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	1.09	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	1.16	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	1.89	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	4.20	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	8.77	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	10.4	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	12.5	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	14.0	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a muddy sandy gravel in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	3.62	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	7.94	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	3.04	mm	0	UKAS	LE	1368
Particle Diameter : Mean	12.7	mm	0	UKAS	LE	1368
Kurtosis	0.629	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.646	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.544	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.604	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.401	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.410	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.448	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.515	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.507	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.524	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.503	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.469	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.511	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.541	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.701	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	1.54	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	3.43	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.82	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	7.16	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.41	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	4.57	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.89	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	2.14	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	1.51	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	58.4	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Acenaphthylene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				

Anthracene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Benzo(a)anthracene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Benzo(a)pyrene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Benzo(b)fluoranthene : Dry Wt	9.59	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	5.56	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Chrysene : Dry Wt	7.84	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Fluoranthene : Dry Wt	3.39	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Indeno(1,2,3-c,d)pyrene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Naphthalene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Phenanthrene : Dry Wt	33.4	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	5.58	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<30	mg/kg	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<40	mg/kg	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<20	mg/kg	20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	<20	mg/kg	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	3	None	LE	897

Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<2	ug/kg	DB, DC	2	UKAS	LE	928
Ethylbenzene : Dry Wt	<0.5	ug/kg	DB, DC	0.5	UKAS	LE	928
Toluene : Dry Wt :- {Methylbenzene}	<3	ug/kg	DB, DC	3	UKAS	LE	928
Dry Solids @ 30°C	91.4	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924

	Brown						
Sample Matrix	Report	Text			None	LE	924
	Sandy Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	38	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206265

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 33 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.58	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.79	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0535	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	24800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	9.30	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.644	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	44.6	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	31.9	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	33.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	32.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	26.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	116	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
Chrysotile detected. Signifies Chrysotile fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0203	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0163	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0366	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0106	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.98	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0530	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0400	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0799	mm	0	UKAS	LE	1368
Kurtosis	0.889	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.540	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.305	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.819	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.749	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.989	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.62	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.76	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.60	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.51	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.19	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.43	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.98	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.38	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	7.13	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	9.22	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	12.1	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	13.2	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	10.5	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	5.94	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.55	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.889	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.330	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.0799	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0838	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	11.3	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	15.2	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	44.9	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	123	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	142	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	142	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	115	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	74.9	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	101	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	27.0	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	186	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	25.6	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	109	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	39.9	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	125	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	197	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.693	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.305	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.235	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.334	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.241	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.289	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.190	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	102	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	205	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	536	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	30.7	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	99.8	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	265	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	434	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	448	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	344	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	330	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	345	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	169	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	60.9	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	79.5	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	8.95	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	56.0	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							

Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	18	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206266

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 37 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0139	mg/kg			None	NLS	864
pH : Solid sample	8.53	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.06	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.117	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	30800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	12.2	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.771	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	49.2	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	36.7	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	45.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	41.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	28.7	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	152	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.6	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0477	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0583	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.106	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0212	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0477	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0954	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0106	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0477	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.97	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0368	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0319	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0843	mm	0	UKAS	LE	1368
Kurtosis	0.893	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.538	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.165	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.936	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.856	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.13	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.83	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.13	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	4.13	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	5.26	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.15	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	6.61	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.49	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	8.24	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.93	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	9.84	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	10.4	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	9.69	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	7.39	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	4.61	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.31	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.587	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0199	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.435	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	17.2	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	26.8	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	64.8	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	202	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	253	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	241	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	200	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	128	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	147	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	46.4	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	283	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	33.9	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	191	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	52.8	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	153	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	323	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.53	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.628	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.518	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.635	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.517	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.566	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.383	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<90	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	121	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	324	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	62.7	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	175	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	271	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	283	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	219	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	204	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	216	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	96.1	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	50.5	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	15.1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	51.5	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							

Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	17	%	DB, DC	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206267

Sampled on: 12-Aug-18 @ (Time not supplied)

Comments: Sample 17 5.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0129	mg/kg			None	NLS	864
pH : Solid sample	8.53	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.25	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.104	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	32600	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	11.0	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.531	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	54.3	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	30.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	63.3	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	45.8	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	29.6	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	152	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01,based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.6	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.175	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0893	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0165	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0496	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0198	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.0694	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.33	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0399	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0322	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.105	mm	0	UKAS	LE	1368
Kurtosis	0.765	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.588	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.201	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.62	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.28	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.81	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.90	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.51	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.13	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	5.57	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.59	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.41	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.91	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.17	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.80	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.84	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.53	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	10.2	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	10.9	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	7.87	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.94	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.33	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.259	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.420	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	19.4	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	21.5	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	54.5	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	184	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	224	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	255	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	205	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	127	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	145	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	45.3	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	265	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	40.2	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	205	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	69.7	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	158	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	308	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.916	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.395	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.446	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.628	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.527	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.596	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.404	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	109	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	215	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	498	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	29.6	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	107	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	258	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	390	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	411	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	313	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	283	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	304	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	131	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	47.0	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	72.3	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	8.96	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	56.0	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							

Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	14	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206268

Sampled on: 15-Aug-18 @ (Time not supplied)

Comments: Sample 35 5.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.92	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.820	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0387	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	21200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	8.90	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.312	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	36.4	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	13.1	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	16.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	28.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	24.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	59.3	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	95.7	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.282	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.328	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.228	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.289	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.305	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.612	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	1.22	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	1.08	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly muddy sand in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.38	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0677	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0429	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.424	mm	0	UKAS	LE	1368
Kurtosis	1.11	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.462	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.387	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.71	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.56	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.68	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.18	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.88	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.02	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	3.24	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	3.38	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	3.48	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	3.96	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.49	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.75	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.75	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	12.5	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	14.1	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	11.5	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.56	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.84	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.928	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.153	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	4.35	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	3.92	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	7.15	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	24.9	ug/kg	1	UKAS	LE	1051

Benzo(a)anthracene : Dry Wt	66.9	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	65.2	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	59.2	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	44.4	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	30.3	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	57.4	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	11.0	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	85.3	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Indeno(1,2,3-c,d)pyrene : Dry Wt	39.9	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Phenanthrene : Dry Wt	37.2	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	107	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.103	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C40 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C44 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C21 - C35 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C40 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C44 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				

Hydrocarbons >C30 - C40 : Dry Wt	<70	mg/kg		40	None	LE	1111
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg		20	None	LE	1111
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg		20	None	LE	1111
ELEVATED_MRV : Dry weight calculation							
Dibutyl Tin : Dry Wt as Cation	<20	ug/kg		3	None	LE	897
ELEVATED_MRV : Matrix interference							
Tributyl Tin : Dry Wt as Cation	<2	ug/kg		1	None	LE	897
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928

		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	59.0	%		*0.5*	None	LE	1130
Extended Sample Description	Report	Text		*0*	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	18	%	*DB, DC*	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	*DB, DC*	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206269

Sampled on: 15-Aug-18 @ (Time not supplied)

Comments: Sample 36 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.78	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.08	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0971	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	27900	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	12.2	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.785	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	46.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	36.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	45.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	37.6	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	28.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	153	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0243	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0324	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0122	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0122	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00405	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.0284	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot.The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.90	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0389	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0338	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0720	mm	0	UKAS	LE	1368
Kurtosis	0.920	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.528	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.174	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.769	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.749	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.949	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.54	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.69	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.67	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.85	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.93	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	6.63	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.71	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	8.59	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	9.38	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	10.4	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	11.0	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	10.1	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	7.51	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	4.48	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.20	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.699	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0499	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.113	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	17.4	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	29.8	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	65.2	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	177	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	244	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	241	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	209	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	122	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	127	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	45.6	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	239	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	35.2	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	195	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	56.8	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	151	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	305	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.83	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.759	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.588	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.700	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.599	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.667	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.508	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	192	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	508	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	20.6	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	98.0	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	274	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	420	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	443	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	339	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	317	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	340	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	146	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	52.5	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	80.4	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	29.4	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.8	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.003	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	50.1	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							

Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	18	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206270

Sampled on: 14-Aug-18 @ (Time not supplied)

Comments: Sample 13 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00970	mg/kg			None	NLS	864
pH : Solid sample	8.23	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.500	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.116	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	5110	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	4.93	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.166	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	13.0	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	10.7	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	58.0	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	11.6	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	7.73	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	50.2	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	83.3	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	2.43	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	2.41	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	2.09	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	1.31	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.717	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.521	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	1.43	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	5.78	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a gravelly sand in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.23	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.175	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.263	mm	0	UKAS	LE	1368
Particle Diameter : Mean	1.31	mm	0	UKAS	LE	1368
Kurtosis	2.59	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.166	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.430	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.134	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.343	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.502	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.619	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.686	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.871	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	1.35	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	1.51	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.728	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.820	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	5.58	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	15.3	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	22.2	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	18.7	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	9.60	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.63	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.896	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.787	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	16.7	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<2	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Acenaphthylene : Dry Wt	2.43	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	5.90	ug/kg	1	UKAS	LE	1051

Benzo(a)anthracene : Dry Wt	15.9	ug/kg	1	UKAS	LE	1051	
Benzo(a)pyrene : Dry Wt	29.5	ug/kg	1	UKAS	LE	1051	
Benzo(b)fluoranthene : Dry Wt	25.7	ug/kg	1	UKAS	LE	1051	
Benzo(ghi)perylene : Dry Wt	20.8	ug/kg	1	UKAS	LE	1051	
Benzo(k)fluoranthene : Dry Wt	14.1	ug/kg	1	UKAS	LE	1051	
Chrysene : Dry Wt	11.5	ug/kg	3	UKAS	LE	1051	
Dibenzo(ah)anthracene : Dry Wt	4.99	ug/kg	1	UKAS	LE	1051	
Fluoranthene : Dry Wt	19.0	ug/kg	1	UKAS	LE	1051	
Fluorene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051	
		ELEVATED_MRV : Matrix interference					
Indeno(1,2,3-c,d)pyrene : Dry Wt	20.2	ug/kg	1	UKAS	LE	1051	
Naphthalene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051	
		ELEVATED_MRV : Matrix interference					
Phenanthrene : Dry Wt	12.5	ug/kg	5	UKAS	LE	1051	
Pyrene : Dry Wt	31.4	ug/kg	1	UKAS	LE	1051	
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111	
Hydrocarbons >C10 - C20 : Dry Wt	<70	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	<80	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C40 : Dry Wt	<70	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111	
Hydrocarbons >C16 - C21 : Dry Wt	<40	mg/kg	30	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	<70	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C40 : Dry Wt	<80	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C44 : Dry Wt	<80	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C21 - C35 : Dry Wt	<70	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C24 - C40 : Dry Wt	<80	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C24 - C44 : Dry Wt	<80	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C30 - C40 : Dry Wt	<50	mg/kg	40	None	LE	1111	

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg		*20*	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg		*20*	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg		*3*	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<1	ug/kg		*1*	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	*DB, DC*	*4*	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	*DB, DC*	*2*	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	*DB, DC*	*2*	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	*DB, DC*	*3*	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	*DB, DC*	*0.01*	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	*DB, DC*	*2*	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	*DB, DC*	*3*	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	*DB, DC*	*2*	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	*DB, DC*	*3*	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	*DB, DC*	*0.3*	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	*DB, DC*	*0.001*	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	*DB, DC*	*4*	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.8	mg/kg	*DB, DC*	*0.7*	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	*DB, DC*	*0.01*	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	*DB, DC*	*4*	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	*DB, DC*	*0.01*	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	*DB, DC*	*1*	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	*DB, DC*	*1*	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	*DB, DC*	*2*	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.7	ug/kg	*DB, DC*	*0.5*	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<4	ug/kg	*DB, DC*	*3*	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	75.1	%		*0.5*	None	LE	1130
Extended Sample Description	Report	Text		*0*	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924

	Grey						
Sample Matrix	Report	Text			None	LE	924
	Sandy Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	7.3	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206271

Sampled on: 14-Aug-18 @ (Time not supplied)

Comments: Sample 10 8.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00760	mg/kg			None	NLS	864
pH : Solid sample	9.44	pH Units	DB, DC	4	None	LE	908
Carbon, Organic : Dry Wt as C	1.33	%		0.1	None	LE	535
Mercury : Dry Wt	0.0192	mg/kg		0.01	None	LE	1042
Aluminium : Dry Wt	7900	mg/kg		20	None	LE	1043
Arsenic : Dry Wt	7.43	mg/kg		1	None	LE	1041
Cadmium : Dry Wt	0.918	mg/kg		0.04	None	LE	1041
Chromium : Dry Wt	20.1	mg/kg		2	None	LE	1041
Copper : Dry Wt	9.08	mg/kg		1	None	LE	1041
Lead : Dry Wt	12.1	mg/kg		2	None	LE	1041
Lithium : Dry Wt	8.31	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	21.4	mg/kg		1	None	LE	1041
Zinc : Dry Wt	48.2	mg/kg		2.5	None	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	None	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	None	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	None	LE	435
Asbestos Report	Report	Text			None	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	5.82	%		0	None	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	2.89	%		0	None	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	3.50	%		0	None	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	4.31	%		0	None	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	5.54	%		0	None	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	7.83	%		0	None	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	11.7	%		0	None	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	11.9	%		0	None	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	16.3	%		0	None	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	15.2	%		0	None	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	15.1	%		0	None	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	None	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	None	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	None	LE	1369
Particle Size Report	Report	Text		None	LE	1369
The sample received was a gravel in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	None	LE	1369
Sorting Coefficient	2.42	Unitless	0	None	LE	1368
Particle Diameter : Median	10.1	mm	0	None	LE	1368
Grain Size Inclusive Mean	8.43	mm	0	None	LE	1368
Particle Diameter : Mean	11.9	mm	0	None	LE	1368
Kurtosis	2.26	Unitless	0	None	LE	1368
Grain Size Inclusive Kurtosis	0.209	mm	0	None	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.498	Unitless	-5	None	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.712	%	0	None	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.489	%	0	None	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.533	%	0	None	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.607	%	0	None	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.694	%	0	None	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.631	%	0	None	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.587	%	0	None	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.488	%	0	None	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.351	%	0	None	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.260	%	0	None	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.170	%	0	None	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.0935	%	0	None	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.0602	%	0	None	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.0468	%	0	None	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	0.0310	%	0	None	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	0.0117	%	0	None	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	0.00468	%	0	None	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.00585	%	0	None	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.0129	%	0	None	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0158	%	0	None	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.0146	%	0	None	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	94.2	%	0	None	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Acenaphthylene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				

Anthracene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Benzo(a)anthracene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Benzo(a)pyrene : Dry Wt	2.25	ug/kg	1	None	LE	1051
Benzo(b)fluoranthene : Dry Wt	8.32	ug/kg	1	None	LE	1051
Benzo(ghi)perylene : Dry Wt	5.64	ug/kg	1	None	LE	1051
Benzo(k)fluoranthene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Chrysene : Dry Wt	<7	ug/kg	3	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Dibenzo(ah)anthracene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Fluoranthene : Dry Wt	3.31	ug/kg	1	None	LE	1051
Fluorene : Dry Wt	<10	ug/kg	5	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Indeno(1,2,3-c,d)pyrene : Dry Wt	<2	ug/kg	1	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Naphthalene : Dry Wt	<10	ug/kg	5	None	LE	1051
		ELEVATED_MRV : Matrix interference				
Phenanthrene : Dry Wt	15.0	ug/kg	5	None	LE	1051
Pyrene : Dry Wt	4.27	ug/kg	1	None	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	None	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<30	mg/kg	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<50	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<60	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<40	mg/kg	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<20	mg/kg	20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	<20	mg/kg	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	3	None	LE	897

Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	None	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	None	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<2	ug/kg	DB, DC	2	None	LE	928
Ethylbenzene : Dry Wt	<0.6	ug/kg	DB, DC	0.5	None	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<3	ug/kg	DB, DC	3	None	LE	928
Dry Solids @ 30°C	92.2	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	1	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
stones							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	48	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206272

Sampled on: 10-Aug-18 @ (Time not supplied)

Comments: Sample 5 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00860	mg/kg			None	NLS	864
pH : Solid sample	9.03	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.390	%		0.1	UKAS	LE	535
Mercury : Dry Wt	5.32	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	3390	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	5.11	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.168	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	10.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	8.52	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	23.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	9.21	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	7.72	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	43.1	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	62.7	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	6.12	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	6.96	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	6.43	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	6.23	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	5.56	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	3.16	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	2.88	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a gravelly sand in a 500G pot.The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.91	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.503	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.652	mm	0	UKAS	LE	1368
Particle Diameter : Mean	1.53	mm	0	UKAS	LE	1368
Kurtosis	0.769	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.587	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.264	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.0336	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.148	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.168	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.181	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.208	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.275	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.262	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.0604	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.645	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.22	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	9.80	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	12.7	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	11.9	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	9.19	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	7.27	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	5.53	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	37.3	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<3	ug/kg	1	UKAS	LE	1051
		ELEVATED_MRV : Matrix interference				
Acenaphthylene : Dry Wt	3.28	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	5.71	ug/kg	1	UKAS	LE	1051

Benzo(a)anthracene : Dry Wt	25.5	ug/kg	1	UKAS	LE	1051	
Benzo(a)pyrene : Dry Wt	54.8	ug/kg	1	UKAS	LE	1051	
Benzo(b)fluoranthene : Dry Wt	50.6	ug/kg	1	UKAS	LE	1051	
Benzo(ghi)perylene : Dry Wt	36.7	ug/kg	1	UKAS	LE	1051	
Benzo(k)fluoranthene : Dry Wt	28.7	ug/kg	1	UKAS	LE	1051	
Chrysene : Dry Wt	28.2	ug/kg	3	UKAS	LE	1051	
Dibenzo(ah)anthracene : Dry Wt	8.52	ug/kg	1	UKAS	LE	1051	
Fluoranthene : Dry Wt	56.4	ug/kg	1	UKAS	LE	1051	
Fluorene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051	
		ELEVATED_MRV : Matrix interference					
Indeno(1,2,3-c,d)pyrene : Dry Wt	36.8	ug/kg	1	UKAS	LE	1051	
Naphthalene : Dry Wt	<10	ug/kg	5	UKAS	LE	1051	
		ELEVATED_MRV : Matrix interference					
Phenanthrene : Dry Wt	42.7	ug/kg	5	UKAS	LE	1051	
Pyrene : Dry Wt	87.0	ug/kg	1	UKAS	LE	1051	
PCB - 028 : Dry Wt	0.194	ug/kg	0.1	UKAS	LE	685	
PCB - 052 : Dry Wt	0.108	ug/kg	0.1	UKAS	LE	685	
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685	
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111	
Hydrocarbons >C10 - C20 : Dry Wt	<60	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	<70	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C40 : Dry Wt	<60	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111	
Hydrocarbons >C16 - C21 : Dry Wt	<40	mg/kg	30	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	<60	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C40 : Dry Wt	<70	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C44 : Dry Wt	<70	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C21 - C35 : Dry Wt	<60	mg/kg	50	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C24 - C40 : Dry Wt	<70	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C24 - C44 : Dry Wt	<70	mg/kg	60	None	LE	1111	
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C30 - C40 : Dry Wt	<50	mg/kg	40	None	LE	1111	

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C40 : Dry Wt	<20	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	<20	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	1.37	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<2	ug/kg	DB, DC	2	UKAS	LE	928
Ethylbenzene : Dry Wt	<0.6	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<4	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	81.3	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	5.6	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206273

Sampled on: 13-Aug-18 @ (Time not supplied)

Comments: Sample 2 2.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.63	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.68	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.135	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	23000	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	9.40	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.470	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	42.5	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	25.8	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	49.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	37.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	25.9	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	128	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
Chrysotile detected. Signifies Chrysotile fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.8	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0910	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0303	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0472	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.04	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0259	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0248	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0553	mm	0	UKAS	LE	1368
Kurtosis	0.777	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.584	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0843	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.28	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.11	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.54	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.56	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.41	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.74	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.01	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	7.73	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.65	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.73	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.14	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	6.42	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	7.26	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	9.58	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	10.6	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	7.84	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	3.45	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.779	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.0200	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.169	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	16.5	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	18.9	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	45.5	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	157	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	184	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	204	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	164	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	106	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	112	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	30.5	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	213	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	31.2	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	159	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	57.7	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	138	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	256	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.910	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.406	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.374	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.435	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.403	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.493	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.329	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	111	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	197	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	427	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	35.9	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	98.2	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	207	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	317	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	331	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	252	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	230	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	245	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	109	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	38.5	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	57.6	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	5.31	ug/kg		3	None	LE	897
Tributyl Tin : Dry Wt as Cation	12.8	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927

Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Dry Solids @ 30°C	57.3	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Black							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206274

Sampled on: 13-Aug-18 @ (Time not supplied)

Comments: Sample 1 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0149	mg/kg			None	NLS	864
pH : Solid sample	8.73	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.69	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0507	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	19000	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.79	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.282	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	36.3	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	31.7	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	26.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	27.3	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	20.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	94.9	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00764	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00382	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00382	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00382	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0115	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.04	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0553	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0396	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0804	mm	0	UKAS	LE	1368
Kurtosis	0.824	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.565	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.332	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.780	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.740	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.71	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.07	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	4.14	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	5.15	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.68	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.55	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.61	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.49	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.87	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.07	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	11.6	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	13.6	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	11.2	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.47	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.94	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.07	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.160	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0306	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	12.8	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	6.25	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	18.3	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	59.9	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	71.8	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	82.5	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	66.2	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	40.4	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	51.6	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	13.8	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	106	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	16.9	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	61.6	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	23.7	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	87.2	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	109	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.272	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.226	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.126	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.154	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.144	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.163	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.106	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg		10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	74.4	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	158	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	391	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	23.3	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	69.0	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	210	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	317	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	332	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	261	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	233	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	248	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	107	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	37.0	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	54.2	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	2.56	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	56.5	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924

	Black						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206275

Sampled on: 12-Aug-18 @ (Time not supplied)

Comments: Sample 14 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.33	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.53	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0332	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	6100	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.52	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.190	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	15.3	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	18.2	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	15.9	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	11.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	9.07	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	52.0	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.3	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.226	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.174	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.124	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0794	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0794	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0645	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
	The sample received was a Slightly gravelly muddy sand in a 500G pot. The entire sample was analysed.					
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.32	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.156	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.140	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.193	mm	0	UKAS	LE	1368
Kurtosis	1.70	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.308	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.347	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0996	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.359	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.648	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.967	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	1.29	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	1.57	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	1.83	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	2.35	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	2.64	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	2.13	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	1.90	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	5.36	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	14.3	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	22.8	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	21.9	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	13.2	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	4.26	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.986	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.638	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.747	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	2.10	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	5.18	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	8.73	ug/kg	1	UKAS	LE	1051

Benzo(a)anthracene : Dry Wt	59.9	ug/kg		1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	78.5	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	67.3	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	57.8	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	38.4	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	47.1	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	12.4	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	68.9	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	52.6	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	6.94	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	24.0	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	82.7	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.111	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg		10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<70	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	95.1	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	294	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	43.0	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	165	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	260	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	273	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	212	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	199	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	212	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	95.3	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	34.0	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	50.0	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	1.56	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	67.2	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

	Sandy Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	6.4	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206276

Sampled on: 12-Aug-18 @ (Time not supplied)

Comments: Sample 19 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00970	mg/kg			None	NLS	864
pH : Solid sample	8.45	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.430	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0394	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	4800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	4.46	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.145	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	<2	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	8.08	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	10.6	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	7.47	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	6.71	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	35.1	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	98.0	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.849	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.541	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.402	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.120	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0870	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sand in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.11	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.187	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.183	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.240	mm	0	UKAS	LE	1368
Kurtosis	1.77	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.293	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.232	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0197	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.265	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.462	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.669	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.836	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.905	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.944	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	1.27	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	1.60	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	1.12	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.324	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	2.74	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	11.7	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	23.0	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	25.3	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	17.6	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	6.93	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	1.72	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.531	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	2.00	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	1.32	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	2.48	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	7.12	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	31.2	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	38.4	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	33.8	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	25.5	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	19.3	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	23.5	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	5.77	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	50.3	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	25.0	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	20.7	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	52.9	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<80	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<40	mg/kg ELEVATED_MRV : Dry weight calculation	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<80	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<80	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<80	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<80	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<50	mg/kg ELEVATED_MRV : Dry weight calculation	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg ELEVATED_MRV : Dry weight calculation	20	None	LE	1111

Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.7	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<4	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	76.0	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							

Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	5.9	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206277

Sampled on: 14-Aug-18 @ (Time not supplied)

Comments: Sample 12 2.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0139	mg/kg			None	NLS	864
pH : Solid sample	8.49	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.90	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.149	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	25500	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	8.89	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.511	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	40.7	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	26.7	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	51.8	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	33.1	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	23.7	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	130	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0322	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0225	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00643	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00965	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00965	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.30	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0345	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0282	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0711	mm	0	UKAS	LE	1368
Kurtosis	0.742	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.598	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.198	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.07	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.38	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.88	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.38	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.84	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.65	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.02	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.06	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.86	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.97	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.50	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.84	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.61	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.65	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	11.9	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	11.1	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.38	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.19	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.490	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.180	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00999	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0804	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	21.5	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	25.5	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	65.0	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	208	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	247	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	262	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	211	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	137	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	160	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	47.8	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	289	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	45.0	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	203	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	76.6	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	168	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	334	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.15	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.505	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.493	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.581	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.528	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.681	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.449	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	413	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	682	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	1330	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	149	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	332	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	608	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	916	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	953	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	729	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	646	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	683	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	307	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	106	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	148	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	45.6	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	55.8	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924

	Grey						
Sample Matrix	Report	Text			None	LE	924
	Sandy Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206278

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 32 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0149	mg/kg			None	NLS	864
pH : Solid sample	8.59	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.82	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0541	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	24500	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	10.2	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.401	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	48.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	27.8	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	36.6	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	39.2	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	27.8	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	114	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0675	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0199	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0119	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0159	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.10	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0256	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0245	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0583	mm	0	UKAS	LE	1368
Kurtosis	0.813	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.569	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0696	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.52	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.12	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.52	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.90	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.50	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.82	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.88	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	7.55	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.52	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.58	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.23	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	7.11	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	7.78	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.80	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	8.95	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	6.94	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	3.79	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.54	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.599	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.230	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00999	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.115	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	9.36	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	10.6	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	26.3	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	82.9	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	103	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	117	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	94.3	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	58.7	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	69.4	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	20.8	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	127	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	20.8	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	90.5	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	38.5	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	94.3	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	135	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.449	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.216	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.203	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.211	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.258	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.326	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.333	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<90	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg		60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C40 : Dry Wt	237	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg		30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	123	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	202	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	215	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	160	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	154	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	167	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	79.3	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	47.0	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	5.54	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
ELEVATED_MRV : Dry weight calculation							
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
ELEVATED_MRV : Dry weight calculation							
Dry Solids @ 30°C	55.6	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							

Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	17	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206279

Sampled on: 14-Aug-18 @ (Time not supplied)

Comments: Sample 15 2.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00750	mg/kg			None	NLS	864
pH : Solid sample	9.16	pH Units	DB, DC	4	None	LE	908
Carbon, Organic : Dry Wt as C	0.200	%		0.1	None	LE	535
Mercury : Dry Wt	<0.01	mg/kg		0.01	None	LE	1042
Aluminium : Dry Wt	2180	mg/kg		20	None	LE	1043
Arsenic : Dry Wt	8.78	mg/kg		1	None	LE	1041
Cadmium : Dry Wt	0.127	mg/kg		0.04	None	LE	1041
Chromium : Dry Wt	9.37	mg/kg		2	None	LE	1041
Copper : Dry Wt	3.96	mg/kg		1	None	LE	1041
Lead : Dry Wt	10.6	mg/kg		2	None	LE	1041
Lithium : Dry Wt	4.03	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	5.76	mg/kg		1	None	LE	1041
Zinc : Dry Wt	21.1	mg/kg		2.5	None	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	None	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	None	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	None	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	None	LE	435
Asbestos Report	Report	Text			None	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	25.8	%		0	None	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	13.0	%		0	None	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	15.6	%		0	None	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	14.7	%		0	None	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	13.1	%		0	None	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	8.79	%		0	None	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	5.39	%		0	None	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	2.06	%		0	None	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	1.49	%		0	None	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	None	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	None	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	None	LE	1369
Particle Size Report	Report	Text		None	LE	1369
The sample received was a Sandy gravel in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	None	LE	1369
Sorting Coefficient	1.69	Unitless	0	None	LE	1368
Particle Diameter : Median	1.81	mm	0	None	LE	1368
Grain Size Inclusive Mean	1.70	mm	0	None	LE	1368
Particle Diameter : Mean	2.54	mm	0	None	LE	1368
Kurtosis	1.53	Unitless	0	None	LE	1368
Grain Size Inclusive Kurtosis	0.345	mm	0	None	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.245	Unitless	-5	None	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.111	%	0	None	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.131	%	0	None	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.164	%	0	None	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.249	%	0	None	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.327	%	0	None	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.380	%	0	None	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.403	%	0	None	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.409	%	0	None	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.419	%	0	None	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.465	%	0	None	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.472	%	0	None	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.472	%	0	None	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.580	%	0	None	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.815	%	0	None	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	0.989	%	0	None	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	0.760	%	0	None	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	0.324	%	0	None	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.753	%	0	None	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	3.24	%	0	None	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	6.62	%	0	None	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	7.69	%	0	None	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	74.2	%	0	None	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	1	None	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	2.76	ug/kg	1	None	LE	1051
Benzo(a)anthracene : Dry Wt	6.78	ug/kg	1	None	LE	1051

Benzo(a)pyrene : Dry Wt	7.45	ug/kg		1	None	LE	1051
Benzo(b)fluoranthene : Dry Wt	7.78	ug/kg		1	None	LE	1051
Benzo(ghi)perylene : Dry Wt	4.05	ug/kg		1	None	LE	1051
Benzo(k)fluoranthene : Dry Wt	3.96	ug/kg		1	None	LE	1051
Chrysene : Dry Wt	5.50	ug/kg		3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg		1	None	LE	1051
Fluoranthene : Dry Wt	16.6	ug/kg		1	None	LE	1051
Fluorene : Dry Wt	<5	ug/kg		5	None	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	3.73	ug/kg		1	None	LE	1051
Naphthalene : Dry Wt	<5	ug/kg		5	None	LE	1051
Phenanthrene : Dry Wt	6.95	ug/kg		5	None	LE	1051
Pyrene : Dry Wt	19.9	ug/kg		1	None	LE	1051
PCB - 028 : Dry Wt	0.260	ug/kg		0.1	None	LE	685
PCB - 052 : Dry Wt	0.119	ug/kg		0.1	None	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg		0.1	None	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg		0.1	None	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg		0.1	None	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg		0.1	None	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg		0.1	None	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg		10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<50	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<60	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<50	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<30	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<50	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<60	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<60	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<50	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<60	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<60	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<40	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<20	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	<20	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg		3	None	LE	897
Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927

Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	None	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	None	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<2	ug/kg	DB, DC	2	None	LE	928
Ethylbenzene : Dry Wt	<0.5	ug/kg	DB, DC	0.5	None	LE	928
Toluene : Dry Wt :- {Methylbenzene}	<3	ug/kg	DB, DC	3	None	LE	928
Dry Solids @ 30°C	100	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	1	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
stones							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	10	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206280

Sampled on: 14-Aug-18 @ (Time not supplied)

Comments: Sample 25 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00970	mg/kg			None	NLS	864
pH : Solid sample	8.56	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.25	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0394	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	14200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.39	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.270	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	27.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	21.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	22.5	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	23.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	15.9	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	75.9	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0275	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0165	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0110	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0138	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly muddy sand in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.07	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0677	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0431	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0886	mm	0	UKAS	LE	1368
Kurtosis	0.848	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.556	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.444	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.04	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.810	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.10	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.06	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.14	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.94	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.45	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	4.66	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	4.59	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	4.75	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.65	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.92	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	7.16	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	11.7	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	15.6	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	14.1	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	7.76	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.29	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.330	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.440	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.390	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0688	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	7.68	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	7.94	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	25.2	ug/kg	1	UKAS	LE	1051

Benzo(a)anthracene : Dry Wt	69.6	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	86.8	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	85.7	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	67.3	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	45.2	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	52.1	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	14.8	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	109	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	15.5	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	63.9	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	27.6	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	77.7	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	136	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.250	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.176	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.120	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.128	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.143	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.154	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.107	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	224	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	124	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	186	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	194	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	150	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	137	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	145	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	62.6	mg/kg	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	33.9	mg/kg	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg	3	None	LE	897
		ELEVATED_MRV : Dry weight calculation				
Tributyl Tin : Dry Wt as Cation	2.47	ug/kg	1	None	LE	897

Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	0.00115	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.7	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<4	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	61.6	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	12	%	*DB, DC*	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	*DB, DC*	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206281

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 43 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.65	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.08	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0666	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	17200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	13.1	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.884	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	33.5	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	21.1	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	28.0	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	23.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	24.8	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	84.1	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
Chrysotile detected. Signifies Chrysotile fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	91.2	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.61	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.43	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0183	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	1.39	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.909	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.789	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.894	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	1.75	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a gravelly mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.83	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0586	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0559	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.609	mm	0	UKAS	LE	1368
Kurtosis	1.30	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.406	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0489	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.38	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.924	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.06	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.71	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.41	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.01	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	3.51	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	3.92	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	4.35	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.52	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.00	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.20	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.58	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.31	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	8.02	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	7.37	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	5.81	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	4.09	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.84	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	2.09	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	1.10	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	8.79	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	18.2	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	22.7	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	62.8	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	140	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	199	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	187	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	142	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	99.1	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	101	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	33.2	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	194	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	28.8	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	130	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	42.7	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	126	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	335	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.649	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.319	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.196	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.157	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.176	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.201	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.154	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	<90	mg/kg		60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C40 : Dry Wt	231	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg		30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	121	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	191	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	201	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	153	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	142	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	152	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	70.2	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	37.5	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	5.34	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927

Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.8	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	62.7	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
	No additional material						
Drying Method	Report	Text			None	LE	924
	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Grey						
Sample Matrix	Report	Text			None	LE	924
	Sandy Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	21	%	DB, DC	0.1	None	SC	1096

Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439	

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206282

Sampled on: 15-Aug-18 @ (Time not supplied)

Comments: Sample 4 2.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00760	mg/kg			None	NLS	864
pH : Solid sample	9.10	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.140	%		0.1	UKAS	LE	535
Mercury : Dry Wt	<0.01	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	3750	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	7.07	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.125	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	16.2	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	6.40	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	7.89	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	9.91	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	11.1	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	29.6	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	24.2	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	7.31	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	10.2	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	11.2	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	13.2	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	11.4	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	9.75	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	5.87	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	3.47	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	3.37	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a sandy gravel in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.81	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	2.57	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	2.22	mm	0	UKAS	LE	1368
Particle Diameter : Mean	3.99	mm	0	UKAS	LE	1368
Kurtosis	1.08	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.474	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.195	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.0379	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.0524	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0699	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.119	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.175	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.213	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.239	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.239	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.224	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.227	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.224	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.184	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.125	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.224	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	0.691	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	1.40	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.94	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.59	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	3.97	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	5.60	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	5.67	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	75.8	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	2.85	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	3.25	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	3.32	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	1.86	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	1.76	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	<3	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	6.55	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	1.63	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	5.72	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	7.71	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<30	mg/kg	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<50	mg/kg ELEVATED_MRV : Dry weight calculation	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<20	mg/kg	20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	<20	mg/kg	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	3	None	LE	897

Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<2	ug/kg	DB, DC	2	UKAS	LE	928
Ethylbenzene : Dry Wt	<0.6	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<3	ug/kg	DB, DC	3	UKAS	LE	928
Dry Solids @ 30°C	86.1	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones and Shells							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							

Sample Colour	Report	Text			None	LE	924
Grey							
Sample Matrix	Report	Text			None	LE	924
Sandy Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	6.7	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206283

Sampled on: 13-Aug-18 @ (Time not supplied)

Comments: Sample 3 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.57	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.81	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0513	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	23800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	7.16	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.326	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	41.6	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	31.9	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	31.4	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	31.7	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	23.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	111	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0176	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0106	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00352	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0317	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0528	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.03	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0193	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0195	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0489	mm	0	UKAS	LE	1368
Kurtosis	0.846	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.556	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.00624	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.64	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.25	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.76	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.41	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.33	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.87	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.99	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.52	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.22	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	8.15	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.86	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	7.84	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.01	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.69	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.55	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	4.59	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	2.54	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.17	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.410	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0799	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.116	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	7.88	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	9.20	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	22.4	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	70.0	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	92.8	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	101	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	79.7	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	51.1	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	54.8	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	17.2	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	109	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	17.0	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	75.1	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	30.4	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	75.6	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	123	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.383	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.254	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.181	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.198	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.196	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.202	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.133	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	130	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	341	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	59.2	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	207	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	287	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	297	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	236	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	210	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	221	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	79.7	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	32.9	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	47.3	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	<2	ug/kg		1	None	LE	897
		ELEVATED_MRV : Matrix interference					
Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927

		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	59.7	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones and Shells							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							

Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206284

Sampled on: 13-Aug-18 @ (Time not supplied)

Comments: Sample 6 3.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0139	mg/kg			None	NLS	864
pH : Solid sample	8.52	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.55	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.197	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	25300	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	9.69	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.831	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	53.7	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	41.6	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	74.3	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	39.2	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	31.9	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	183	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0132	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00331	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0463	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00662	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00331	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00992	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00331	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0232	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.20	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0202	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0206	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0647	mm	0	UKAS	LE	1368
Kurtosis	0.930	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.525	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0287	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.89	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.39	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.91	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.50	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.19	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.40	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.31	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	7.95	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.13	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	8.54	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	8.35	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	7.84	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	7.26	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.49	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.52	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	4.22	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	2.87	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.14	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.74	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	1.05	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.200	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.109	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	28.3	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	46.2	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	82.3	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	331	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	367	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	381	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	310	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	203	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	278	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	69.0	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	454	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	58.7	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	285	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	89.1	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	198	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	467	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.84	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.761	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.793	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.898	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.931	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	1.10	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.758	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	417	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	698	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	1450	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	142	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	346	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	666	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	1030	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	1100	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	819	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	752	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	817	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	368	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	133	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	202	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	36.8	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	58.1	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	14	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206285

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 41 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.87	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.07	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0962	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	25800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	11.6	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.774	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	47.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	41.5	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	52.8	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	39.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	28.6	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	179	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	96.8	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.188	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.233	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.277	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.183	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.157	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.152	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0984	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.246	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	1.63	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.17	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0228	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0225	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.573	mm	0	UKAS	LE	1368
Kurtosis	1.16	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.448	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0693	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.27	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.03	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.35	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.54	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.03	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.47	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.90	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.17	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.81	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	9.58	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	9.80	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	9.52	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.57	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.76	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.69	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	2.96	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.73	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.03	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.808	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.924	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.876	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	3.17	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	521	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	29.7	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	398	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	872	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	900	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	828	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	614	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	379	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	785	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	129	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	2050	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	422	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	516	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	235	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	2650	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	1940	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.45	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.610	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.502	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.581	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.542	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.606	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.406	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	216	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	559	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	118	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	296	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	460	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	487	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	365	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	343	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	370	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	164	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	59.4	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	92.5	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	35.8	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	51.4	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant and Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924

	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	17	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206286

Sampled on: 13-Aug-18 @ (Time not supplied)

Comments: Sample 7 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0515	mg/kg			None	NLS	864
pH : Solid sample	8.28	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	4.33	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0828	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	22800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	12.6	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.644	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	45.4	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	88.2	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	42.9	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	34.6	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	26.1	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	193	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00616	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0185	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00616	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a Slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.97	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0477	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0394	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0811	mm	0	UKAS	LE	1368
Kurtosis	0.874	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.546	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.208	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.620	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.550	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.740	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.47	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.47	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	3.57	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.76	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.89	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	6.42	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	6.85	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.98	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	7.66	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	9.29	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	10.9	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	11.3	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	9.29	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	5.93	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.10	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.41	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.650	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.120	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0308	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	7.13	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	13.1	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	20.2	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	90.7	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	118	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	122	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	111	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	64.6	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	74.3	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	22.7	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	118	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	16.8	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	93.2	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	31.2	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	72.6	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	140	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.397	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.572	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.188	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.186	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.214	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.271	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.192	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<30	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	175	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	349	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	858	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	58.2	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	164	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	460	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	683	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	715	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	561	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	509	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	541	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	223	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	77.2	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	119	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<40	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	5.14	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<6	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<6	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C8 : Dry Wt	<9	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<6	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<9	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<6	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<9	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.9	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	0.00675	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<3	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<3	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<5	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	2.67	ug/kg	DB, DC	0.5	UKAS	LE	928
Toluene : Dry Wt :- {Methylbenzene}	37.8	ug/kg	DB, DC	3	UKAS	LE	928
Dry Solids @ 30°C	38.2	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	14	%	*DB, DC*	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	*DB, DC*	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206287

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 39 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0160	mg/kg			None	NLS	864
pH : Solid sample	8.67	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.40	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0734	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	28200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	11.9	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.739	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	48.5	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	46.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	48.5	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	37.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	28.1	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	179	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
Chrysotile detected. Signifies Chrysotile fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.1	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0785	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0638	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0147	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.137	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.152	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.196	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.128	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0883	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.98	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0268	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0258	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.112	mm	0	UKAS	LE	1368
Kurtosis	0.986	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.505	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0174	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.922	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.902	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.19	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.96	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.43	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	4.73	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.30	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	7.66	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.33	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	9.23	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	9.65	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	9.61	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	9.37	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.50	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.57	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	4.09	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	2.27	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.66	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.57	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.991	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.218	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.858	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	15.2	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	24.6	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	55.5	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	181	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	229	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	220	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	195	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	117	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	122	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	43.9	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	222	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	30.9	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	173	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	57.2	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	129	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	275	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.38	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.577	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.448	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.423	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.488	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.562	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.404	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	161	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	517	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	86.9	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	332	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	447	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	462	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	381	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	356	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	371	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	115	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	62.7	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	14.6	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<8	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.8	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.003	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.03	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<7	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	45.7	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924

	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	16	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206288

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 38 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.76	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.03	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0772	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	30100	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	12.1	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.727	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	52.0	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	40.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	47.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	42.7	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	29.9	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	170	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.7	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0541	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0774	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0735	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0658	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0271	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0309	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00387	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.88	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0201	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0199	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0501	mm	0	UKAS	LE	1368
Kurtosis	0.930	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.525	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0274	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.32	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.18	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.55	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.55	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.43	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.96	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.71	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.99	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	9.27	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	9.75	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	9.69	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	9.17	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.54	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.44	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.55	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	3.47	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.96	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.967	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.179	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.333	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	21.9	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	40.6	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	103	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	320	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	410	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	373	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	318	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	202	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	197	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	71.5	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	340	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	44.4	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	280	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	80.5	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	180	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	499	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	4.22	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	1.92	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	1.07	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	1.08	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	1.04	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	1.24	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.944	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	172	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	458	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	83.2	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	239	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	381	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	398	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	302	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	286	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	303	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	142	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	52.1	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	74.2	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	14.0	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	50.7	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924

	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	17	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206289

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 40 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.79	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	2.10	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.103	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	30300	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	13.2	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	1.02	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	53.2	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	46.1	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	85.7	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	42.4	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	31.2	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	197	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	94.8	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.255	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.314	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.260	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.319	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0441	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.568	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0147	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	3.39	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.42	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0324	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0315	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.775	mm	0	UKAS	LE	1368
Kurtosis	1.19	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.439	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0824	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.01	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.911	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.17	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.86	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	3.20	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	4.32	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	5.65	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.80	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.39	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	8.23	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	8.56	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.45	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.45	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.39	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	7.64	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	5.89	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	3.78	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.08	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.854	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.199	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00948	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	5.16	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	13.5	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	22.0	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	48.7	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	145	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	182	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	184	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	162	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	96.6	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	94.6	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	35.8	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	181	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	28.9	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	146	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	51.5	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	111	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	226	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	1.33	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.577	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.417	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.474	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.443	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.503	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.337	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	254	mg/kg		50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	487	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	1110	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	76.7	mg/kg		10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	239	mg/kg		30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	539	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	858	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	904	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	665	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	625	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	671	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	319	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	125	mg/kg		20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	177	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	49.0	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	48.3	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant and Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Sample Colour		Report	Text			None	LE	924
	Brown							
Sample Matrix		Report	Text			None	LE	924
	Clay Sediment							
Sample Preparation		Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight		17	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt		<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206290

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 42 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.70	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.92	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0745	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	27500	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	11.4	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.642	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	47.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	34.6	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	44.6	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	40.6	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	27.8	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	143	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0354	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0456	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00506	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00506	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.93	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0186	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0185	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0405	mm	0	UKAS	LE	1368
Kurtosis	0.909	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.533	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0225	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.61	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.34	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.78	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.92	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.00	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.53	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	8.10	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	9.05	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.97	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	9.23	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	9.16	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.80	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.30	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.22	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.36	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	3.45	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	2.08	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.929	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.0700	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0911	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	15.0	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	4.94	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	31.0	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	89.7	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	96.3	ug/kg		1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	103	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	85.1	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	52.1	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	70.8	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	17.7	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	168	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	21.6	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	75.9	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	28.2	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	135	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	163	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.261	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.122	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.108	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.132	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.137	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.155	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.119	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	130	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	320	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	<60	mg/kg		30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	158	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	252	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	267	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	201	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	190	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	190	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	93.5	mg/kg		40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	54.1	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	8.56	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C8 : Dry Wt	<7	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<7	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<5	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<7	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<10	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	49.2	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924

	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	17	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206291

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 27 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0149	mg/kg			None	NLS	864
pH : Solid sample	8.79	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.15	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0362	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	18800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.54	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.249	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	33.5	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	19.1	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	25.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	30.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	19.0	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	82.9	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00910	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00910	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00910	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00303	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.10	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0139	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0158	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0399	mm	0	UKAS	LE	1368
Kurtosis	0.872	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.547	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0913	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.23	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.71	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.39	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	4.02	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	6.74	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	8.30	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	9.51	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	9.55	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.32	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.59	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.92	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	6.51	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	6.58	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.49	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.52	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	3.80	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	2.24	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.21	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.370	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0100	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0303	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	4.61	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	3.83	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	13.1	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	43.8	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	55.1	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	65.0	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	54.5	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	31.9	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	33.8	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	11.4	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	67.6	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	11.1	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	50.1	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	22.0	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	50.7	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	70.9	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.213	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.115	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.126	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.121	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.150	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.161	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.118	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	118	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C40 : Dry Wt	101	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	105	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	83.2	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C44 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C30 - C40 : Dry Wt	<70	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				

Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	<2	ug/kg		1	None	LE	897
		ELEVATED_MRV : Matrix interference					
Hydrocarbons >C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.6	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	59.5	%		0.5	None	LE	1130

Extended Sample Description	Report	Text		*0*	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant and Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	13	%	*DB, DC*	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	*DB, DC*	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206292

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 18 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0230	mg/kg			None	NLS	864
pH : Solid sample	8.73	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.17	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0315	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	18800	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.38	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.218	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	32.4	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	18.0	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	23.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	26.4	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	18.0	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	74.2	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00964	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00321	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00642	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00321	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00321	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00321	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0385	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00642	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.95	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.00948	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0112	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0333	mm	0	UKAS	LE	1368
Kurtosis	0.962	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.513	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.143	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.95	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	2.21	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	3.10	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	5.27	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	8.69	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	10.4	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	11.4	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	10.8	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.79	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.43	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.22	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.43	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.27	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	5.00	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	3.87	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	2.09	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	0.720	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.150	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.110	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0799	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0739	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	7.38	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	4.86	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	15.6	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	52.5	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	66.2	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	72.8	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	61.5	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	36.6	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	43.1	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	13.1	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	91.4	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	13.4	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	57.0	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	23.8	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	74.2	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	96.2	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.233	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.117	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.104	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.119	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.128	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<30	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<200	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<200	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	236	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<30	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<90	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	<200	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C40 : Dry Wt	202	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	206	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<200	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C40 : Dry Wt	<200	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C44 : Dry Wt	<200	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C30 - C40 : Dry Wt	<100	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<60	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<60	mg/kg	20	None	LE	1111

Dibutyl Tin : Dry Wt as Cation	<9	ELEVATED_MRV : Dry weight calculation ug/kg		3	None	LE	897
Tributyl Tin : Dry Wt as Cation	<3	ELEVATED_MRV : Matrix interference ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<9	ELEVATED_MRV : Matrix interference mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<4	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<6	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<4	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<6	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<6	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.6	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<9	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<2	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<9	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	ELEVATED_MRV : Dry weight calculation mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<3	ELEVATED_MRV : Dry weight calculation ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<3	ELEVATED_MRV : Dry weight calculation ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<6	ELEVATED_MRV : Dry weight calculation ug/kg	DB, DC	2	UKAS	LE	928
Ethylbenzene : Dry Wt	<2	ELEVATED_MRV : Dry weight calculation ug/kg	DB, DC	0.5	UKAS	LE	928
Toluene : Dry Wt :- {Methylbenzene}	<9	ELEVATED_MRV : Dry weight calculation ug/kg	DB, DC	3	UKAS	LE	928

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Dry Solids @ 30°C	31.9	%		*0.5*	None	LE	1130
Extended Sample Description	Report	Text		*0*	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	14	%	*DB, DC*	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	*DB, DC*	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206293

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 9 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.68	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.940	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0363	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	14200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	5.52	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.193	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	27.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	15.0	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	18.8	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	22.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	15.0	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	61.0	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0133	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0133	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.19	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0110	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0136	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0401	mm	0	UKAS	LE	1368
Kurtosis	0.853	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.554	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.161	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.92	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	2.20	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	3.11	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	5.16	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	8.29	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	9.48	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	9.95	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	9.05	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.27	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	6.43	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.85	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.54	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.78	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.06	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.41	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	3.65	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.88	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.961	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.562	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.204	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.225	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0267	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	3.88	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	3.59	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	13.9	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	39.8	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	45.6	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	49.5	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	40.4	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	25.4	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	30.4	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	8.73	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	64.1	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	7.65	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	37.2	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	13.1	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	46.4	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	69.0	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.257	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.121	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	192	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<70	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	108	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	170	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	174	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	141	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	129	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	134	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<90	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<40	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Dibutyl Tin : Dry Wt as Cation	<7	ug/kg	3	None	LE	897
		ELEVATED_MRV : Matrix interference				
Tributyl Tin : Dry Wt as Cation	2.55	ug/kg	1	None	LE	897

Hydrocarbons >C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<5	mg/kg	DB, DC	3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.5	mg/kg	DB, DC	0.3	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<7	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
		ELEVATED_MRV : Dry weight calculation					
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	44.8	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924

Plant material

Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	18	%	DB, DC	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206294

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 8 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.76	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.33	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0433	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	25000	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	5.80	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.192	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	38.3	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	19.4	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	22.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	30.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	18.8	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	77.2	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

No asbestos detected (NAD)

No asbestos detected signifies no asbestos fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00723	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00362	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00362	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.20	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0446	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0322	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0720	mm	0	UKAS	LE	1368
Kurtosis	0.772	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.585	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.298	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.46	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.13	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.60	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.68	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.44	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.34	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	5.94	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	5.87	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.28	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.22	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.20	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.64	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	7.62	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	10.8	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	12.4	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	10.1	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	5.78	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.63	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.860	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0800	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0145	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	9.08	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	4.29	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	27.5	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	74.0	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	79.4	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	86.0	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	70.2	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	44.0	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	57.9	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	15.3	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	137	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	16.3	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	66.7	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	23.3	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	102	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	128	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.207	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.128	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.111	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.111	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.125	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	164	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	82.8	mg/kg	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	133	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	140	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	106	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<100	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C24 - C44 : Dry Wt	104	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<70	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg	3	None	LE	897
		ELEVATED_MRV : Matrix interference				

Tributyl Tin : Dry Wt as Cation	<2	ug/kg	1	None	LE	897
	ELEVATED_MRV : Matrix interference					
Hydrocarbons >C5 - C10 : Dry Wt	<5	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<5	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.9	mg/kg DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<5	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	60.0	%	0.5	None	LE	1130
Extended Sample Description	Report	Text	0	None	LE	1067
Accreditation Assessment	2	No.		None	LE	924
Additional Material Present	Report	Text		None	LE	924
Plant material						
Drying Method	Report	Text		None	LE	924

	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	13	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206295

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 11 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0128	mg/kg			None	NLS	864
pH : Solid sample	8.74	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.11	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0402	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	20400	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	6.35	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.178	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	34.0	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	16.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	20.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	25.0	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	16.9	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	67.1	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	100	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00367	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00367	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00733	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.12	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0118	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0140	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0381	mm	0	UKAS	LE	1368
Kurtosis	0.889	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.540	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.137	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.62	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.98	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.77	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	4.61	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	7.63	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	9.16	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	10.1	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	9.66	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.97	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.05	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.43	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	6.11	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	6.09	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	5.84	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.82	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	3.25	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.95	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	1.20	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.590	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.150	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0147	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	5.54	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	3.42	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	13.4	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	42.3	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	50.2	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	61.8	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	47.6	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	30.3	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	36.6	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	10.2	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	79.4	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	11.9	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	44.3	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	22.3	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	69.2	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	76.3	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.179	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.108	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C20 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C24 : Dry Wt	<90	mg/kg	60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C10 - C40 : Dry Wt	149	mg/kg	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg	10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg	30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C30 : Dry Wt	<80	mg/kg	50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C20 - C40 : Dry Wt	126	mg/kg	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	131	mg/kg	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	102	mg/kg	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	94.6	mg/kg	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	99.8	mg/kg	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<60	mg/kg	40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg	20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation				
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg	3	None	LE	897
		ELEVATED_MRV : Matrix interference				

Tributyl Tin : Dry Wt as Cation	<2	ug/kg	1	None	LE	897
	ELEVATED_MRV : Matrix interference					
Hydrocarbons >C5 - C10 : Dry Wt	<6	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5 - C8 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<3	mg/kg DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 : Dry Wt	<4	mg/kg DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.4	mg/kg DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<6	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<6	mg/kg DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation					
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Benzene : Dry Wt	<2	ug/kg DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.8	ug/kg DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<5	ug/kg DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	63.6	%	0.5	None	LE	1130
Extended Sample Description	Report	Text	0	None	LE	1067
Accreditation Assessment	2	No.		None	LE	924
Additional Material Present	Report	Text		None	LE	924
Plant material						
Drying Method	Report	Text		None	LE	924

	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	13	%	DB, DC	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206296

Sampled on: 19-Aug-18 @ (Time not supplied)

Comments: Sample 29 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0149	mg/kg			None	NLS	864
pH : Solid sample	8.87	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.40	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0525	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	27200	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	7.79	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.262	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	41.0	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	20.0	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	27.7	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	35.8	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	20.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	90.9	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
Chrysotile detected. Signifies Chrysotile fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0140	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0186	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00465	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0140	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

NLS Leeds
Olympia House
Gelderd Lane
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Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	1.92	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.00980	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0114	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0293	mm	0	UKAS	LE	1368
Kurtosis	1.01	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.497	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.143	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.66	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	2.05	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.89	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	4.86	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	8.21	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	10.2	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	11.7	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	11.5	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	9.49	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.93	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.44	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.39	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	4.95	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	4.44	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	3.30	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	1.88	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	0.970	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.660	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.450	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0999	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0512	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	13.5	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	13.8	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	39.8	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	123	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	148	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	153	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	131	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	78.1	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	88.8	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	27.6	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	175	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	26.5	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	117	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	45.8	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	119	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	194	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.763	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.346	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.289	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.267	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.354	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.417	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.413	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<90	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	<100	mg/kg		60	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C40 : Dry Wt	199	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	<50	mg/kg		30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	108	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	172	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	181	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	139	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	132	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	140	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<70	mg/kg		40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	35.7	mg/kg		20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	2.20	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.6	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<0.9	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	57.7	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924

	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	16	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206297

Sampled on: 20-Aug-18 @ (Time not supplied)

Comments: Sample 21 8.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.00970	mg/kg			None	NLS	864
pH : Solid sample	8.76	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.710	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0142	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	20100	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	8.78	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.300	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	31.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	8.20	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	10.2	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	23.9	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	19.4	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	45.4	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435
No asbestos detected (NAD) No asbestos detected signifies no asbestos fibres were found in the sample examined. The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.							
Grain Size Fraction : <1000 microns : {>0 phi}	99.6	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00949	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0316	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0285	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.193	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.174	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.59	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0606	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0340	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.102	mm	0	UKAS	LE	1368
Kurtosis	0.763	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.589	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.459	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	4.26	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	2.29	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.54	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.33	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.30	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	4.31	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	4.41	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	4.32	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	4.18	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	4.50	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.36	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	3.62	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	3.93	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.14	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	12.3	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	14.4	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	10.4	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	4.33	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.597	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.437	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	1.19	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	1.00	ug/kg	1	UKAS	LE	1051

Benzo(a)pyrene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	4.25	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	3.02	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Chrysene : Dry Wt	<3	ug/kg	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	2.13	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	1.10	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	8.11	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	2.43	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	<90	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<10	mg/kg	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	<40	mg/kg ELEVATED_MRV : Dry weight calculation	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	<90	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	<90	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	<70	mg/kg ELEVATED_MRV : Dry weight calculation	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	<90	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	<90	mg/kg ELEVATED_MRV : Dry weight calculation	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<60	mg/kg ELEVATED_MRV : Dry weight calculation	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	<30	mg/kg ELEVATED_MRV : Dry weight calculation	20	None	LE	1111

Hydrocarbons >C35 - C44 : Dry Wt	<30	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Dibutyl Tin : Dry Wt as Cation	<20	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	<1	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<2	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	<3	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.3	mg/kg	DB, DC	0.3	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.001	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<0.7	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<4	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.01	mg/kg	DB, DC	0.01	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<1	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	<1	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<3	ug/kg	DB, DC	2	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Ethylbenzene : Dry Wt	<0.7	ug/kg	DB, DC	0.5	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Toluene : Dry Wt :- {Methylbenzene}	<4	ug/kg	DB, DC	3	UKAS	LE	928
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	68.0	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones and Shells							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							
Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	0.1	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	0.6	None	SC	439

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Analysis.

Folder No: 004206298

Sampled on: 20-Aug-18 @ (Time not supplied)

Comments: Sample 30 0.00m

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg			None	NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	<0.0150	mg/kg			None	NLS	864
pH : Solid sample	8.61	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.99	%		0.1	UKAS	LE	535
Mercury : Dry Wt	0.0651	mg/kg		0.01	UKAS	LE	1042
Aluminium : Dry Wt	18900	mg/kg		20	UKAS	LE	1043
Arsenic : Dry Wt	2.91	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.256	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	17.8	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	23.6	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	25.6	mg/kg		2	UKAS	LE	1041
Lithium : Dry Wt	32.2	mg/kg		0.3	None	LE	1041
Nickel : Dry Wt	61.8	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	94.7	mg/kg		2.5	UKAS	LE	1041
Asbestos : Actinolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Amosite :- {Brown Asbestos}	Present	Pres/NF		0	UKAS	LE	435
Asbestos : Anthophyllite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Chrysotile :- {White Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Crocidolite :- {Blue Asbestos}	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos : Tremolite	Not Found	Pres/NF		0	UKAS	LE	435
Asbestos Report	Report	Text			UKAS	LE	435

Amosite detected.
Signifies Amosite fibres were found in the sample examined.
The analysis was carried out by method LE P Asbestos (Microscopy) 01, based on HSG248.

Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00844	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00422	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00844	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00422	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00422	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00422	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0211	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0127	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369

Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	0	UKAS	LE	1369
Particle Size Report	Report	Text		UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a 500G pot. The entire sample was analysed.						
Raw Data Report	Report	Text	0	UKAS	LE	1369
Sorting Coefficient	2.05	Unitless	0	UKAS	LE	1368
Particle Diameter : Median	0.0246	mm	0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0238	mm	0	UKAS	LE	1368
Particle Diameter : Mean	0.0586	mm	0	UKAS	LE	1368
Kurtosis	0.863	Unitless	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	0.550	mm	0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.0427	Unitless	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.19	%	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.08	%	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.48	%	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	2.51	%	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.43	%	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.88	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.29	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.02	%	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.77	%	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.90	%	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	8.00	%	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.26	%	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.67	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.51	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	7.19	%	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	5.23	%	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	3.58	%	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.23	%	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.750	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0200	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0675	%	0	UKAS	LE	1370
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	None	LE	672
Acenaphthene : Dry Wt	14.2	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	6.68	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	27.9	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	89.6	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	102	ug/kg	1	UKAS	LE	1051

Benzo(b)fluoranthene : Dry Wt	117	ug/kg		1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	97.9	ug/kg		1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	58.8	ug/kg		1	UKAS	LE	1051
Chrysene : Dry Wt	69.7	ug/kg		3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	20.5	ug/kg		1	UKAS	LE	1051
Fluoranthene : Dry Wt	162	ug/kg		1	UKAS	LE	1051
Fluorene : Dry Wt	21.1	ug/kg		5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	87.7	ug/kg		1	UKAS	LE	1051
Naphthalene : Dry Wt	33.5	ug/kg		5	UKAS	LE	1051
Phenanthrene : Dry Wt	124	ug/kg		5	UKAS	LE	1051
Pyrene : Dry Wt	160	ug/kg		1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.382	ug/kg		0.1	UKAS	LE	685
PCB - 052 : Dry Wt	0.247	ug/kg		0.1	UKAS	LE	685
PCB - 101 : Dry Wt	0.223	ug/kg		0.1	UKAS	LE	685
PCB - 118 : Dry Wt	0.216	ug/kg		0.1	UKAS	LE	685
PCB - 138 : Dry Wt	0.247	ug/kg		0.1	UKAS	LE	685
PCB - 153 : Dry Wt	0.272	ug/kg		0.1	UKAS	LE	685
PCB - 180 : Dry Wt	0.212	ug/kg		0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C20 : Dry Wt	<100	mg/kg		50	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C10 - C24 : Dry Wt	118	mg/kg		60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	280	mg/kg		50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	<20	mg/kg		10	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C16 - C21 : Dry Wt	<60	mg/kg		30	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C20 - C30 : Dry Wt	158	mg/kg		50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	227	mg/kg		60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	237	mg/kg		60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	195	mg/kg		50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	162	mg/kg		60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	173	mg/kg		60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	<80	mg/kg		40	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C40 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Hydrocarbons >C35 - C44 : Dry Wt	<40	mg/kg		20	None	LE	1111
		ELEVATED_MRV : Dry weight calculation					
Dibutyl Tin : Dry Wt as Cation	<30	ug/kg		3	None	LE	897
		ELEVATED_MRV : Matrix interference					
Tributyl Tin : Dry Wt as Cation	7.10	ug/kg		1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
		ELEVATED_MRV : Dry weight calculation					

Hydrocarbons >C5 - C6 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C10 : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	<4	mg/kg	DB, DC	2	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 : Dry Wt	<6	mg/kg	DB, DC	3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	<0.6	mg/kg	DB, DC	0.3	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	<0.002	mg/kg	DB, DC	0.001	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	<1	mg/kg	DB, DC	0.7	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	<8	mg/kg	DB, DC	4	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	<0.02	mg/kg	DB, DC	0.01	None	LE	927
	ELEVATED_MRV : Dry weight calculation						
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Benzene : Dry Wt	<2	ug/kg	DB, DC	1	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	<4	ug/kg	DB, DC	2	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Ethylbenzene : Dry Wt	<1	ug/kg	DB, DC	0.5	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Toluene : Dry Wt :- {Methylbenzene}	<6	ug/kg	DB, DC	3	UKAS	LE	928
	ELEVATED_MRV : Dry weight calculation						
Dry Solids @ 30°C	52.0	%		0.5	None	LE	1130
Extended Sample Description	Report	Text		0	None	LE	1067
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924

	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Jaw Crushed & Sieved to <2mm						
Calcium Carbonate Equivalent : Dry Weight	15	%	DB, DC	*0.1*	None	SC	1096
Chromium Hexavalent : Dry Wt	<0.6	mg/kg	DB, DC	*0.6*	None	SC	439

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

Method Description Summary for all samples in batch Number 20124889

435	LE P Asbestos (Microscopy) 01 or NM NM025 - type identification by polarised light microscopy; HSG 248 methodology
439	Sub-contract
535	LE I TOC 01 - combusted with oxygen; thermal conductivity detection
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
864	Parameter by calculation
897	LE O Organotins (GCMS) 01 - acetic acid/methanol extracted; derivatised; determined GCMS (SIM); from "as received" sample
908	LE I pH & EC - pH, Conductivity - water extracted; determined by specific electrode; from "as received" sample
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
927	LE O VPH >C5-C10 GCMS)01
928	LE O VOC (GCMS) 01 - water extracted; gently heated; determined by HS-GCMS (SIM); from "as received" sample
1041	LE M Metals ICP-MS Sediment - microwave aqua regia digested, determined by ICPMS, samples are sieved to <2000um.
1042	LE M Mercury CSEMP - microwave aqua regia digeste, acidic SnCl2 reduced, determined by CV-AFS. Samples are sieved to <2000um.
1043	LE M Metals Marine (ICPOES) - microwave aqua regia digested, determined by ICPOES, samples are sieved to <2000um.
1051	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
1067	Sample Description of "as received" sample
1096	Sub-contract
1111	LE O EPH >C5-C44 (GC-FID) 01 - Hydrocarbon screen including arom/aliph banding by GC-FID; from "as received" sample
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.
1368	LE P Particle Size Sediment by Laser Diffraction - various parameters calculated from the band sizes produced by laser beam diffraction technique
1369	LE P Particle Size Sediment Sieve - various band sizes >1000mm - determined by manual sieving.
1370	LE P Particle Size Sediment by Laser Diffraction - various band sizes <1000mm - determined by laser beam diffraction instrumentation.

Steve Moss
Laboratory Site Manager

'The results in this Certificate of Analysis are the definitive test results. Any accompanying results are provided for ease of use by the customer and should be used with caution.

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 quoted and will be above the MRV.
Minimum Reporting Value (MRV). A minimum concentration selected for reporting purposes (i.e. the less than value), which is higher than the statistically derived method limit of detection.

Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Uncertainty of Measurement information relating to sample results is supplied upon request. Uncertainty is estimated from the performance of routine quality control standards, using the calculation 2 X Relative Standard Deviation + Bias. This is based on the guidance issued by the UKTAG Chemistry task team - Guidance on the implementation of the Quality Assurance/Quality Control requirements' associated with Commission Directive 2009/90/EC, Article 4 (UoM = 2 X %RSD), with a contribution added for the bias.

Key to Results Flags:

DB Samples received outside specified stability times. It is possible that the results may be compromised.

DC Analysis started outside of specified stability 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

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124889 - 2

0754

Batch description: Sediment samples from Dublin Port Eire

Reported on: 16-Oct-2018

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

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Karen Blackmore
Fugro GeoServices Ltd
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Dear Karen

Please find attached the results for the batch of 6 samples described below.

Samples Registered on:	29-Aug-2018
Analysis Started on:	29-Aug-2018
Analysis Completed on:	15-Oct-2018
Results for Batch Number	20124893
Your Purchase Order Number:	70138KB-WAL

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

Lawrence Green
Customer Services Team Manager
Tel: 0800 092 0786
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223150

Sampled on: 15-Aug-18 @ (Time not supplied)

Comments: Sample 4 Depth 2.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	10.0	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	<0.3	mol/kg	DC	0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.3	mol/kg	DC	0.3	UKAS	LE	741
Dry Solids @ 105°C	90.0	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	0.773	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	2.32	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.95	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.210	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	6.85	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	351	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	730	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	12.6	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	<0.0100	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.0196	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	<0.100	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	<0.00500	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	<0.0100	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.0451	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	<0.0100	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	<0.0100	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	<0.0300	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239602	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	2050	mg/kg	DB, DC	100	UKAS	LE	531
Fluoride, Leachable : Dry Wt	0.960	mg/kg	DB, DC	0.5	UKAS	LE	531

pH, Leachable	9.34	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	4600	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	88.3	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
Stones							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223151

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 11 Depth 0.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	33.7	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	1.59	mol/kg		0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.5	mol/kg		0.3	UKAS	LE	741
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 105°C	66.3	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	14.1	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	6.13	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.72	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.990	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	43.4	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	1350	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	3760	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	270	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	0.0234	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.0604	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	<0.100	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	<0.00500	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	0.158	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.381	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	0.0362	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	0.0111	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	<0.0300	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239603	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	11800	mg/kg	DB, DC	100	UKAS	LE	531

Fluoride, Leachable : Dry Wt	7.44	mg/kg	DB, DC	0.5	UKAS	LE	531
pH, Leachable	8.33	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	25300	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	64.6	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223152

Sampled on: 12-Aug-18 @ (Time not supplied)

Comments: Sample 14 Depth 0.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	34.4	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	0.562	mol/kg	DB, DC	0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.5	mol/kg	DB, DC	0.3	UKAS	LE	741
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 105°C	65.6	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	4.75	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	5.32	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.12	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.20	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	42.6	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	2180	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	4080	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	395	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	0.0713	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.758	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	0.139	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	<0.00500	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	0.183	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.965	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	0.0594	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	0.0522	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	0.0330	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239604	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	11600	mg/kg	DB, DC	100	UKAS	LE	531

Fluoride, Leachable : Dry Wt	6.24	mg/kg	DB, DC	0.5	UKAS	LE	531
pH, Leachable	8.32	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	28800	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	65.3	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223153

Sampled on: 18-Aug-18 @ (Time not supplied)

Comments: Sample 27 Depth 0.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	41.1	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	1.29	mol/kg		0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.5	mol/kg		0.3	UKAS	LE	741
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 105°C	58.9	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	6.77	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	7.07	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.72	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.01	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	50.3	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	1520	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	4300	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	267	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	0.0245	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.0482	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	<0.100	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	0.00560	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	0.126	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.392	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	0.0376	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	<0.0100	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	<0.0300	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239605	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	13600	mg/kg	DB, DC	100	UKAS	LE	531

Fluoride, Leachable : Dry Wt	8.61	mg/kg	DB, DC	0.5	UKAS	LE	531
pH, Leachable	8.46	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	28000	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	60.8	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223154

Sampled on: 15-Aug-18 @ (Time not supplied)

Comments: Sample 35 Depth 5.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	29.6	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	2.37	mol/kg	DC	0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.4	mol/kg	DC	0.3	UKAS	LE	741
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 105°C	70.4	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	5.46	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	4.58	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.87	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	0.790	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	26.2	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	734	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	2370	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	125	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	0.0506	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.110	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	<0.100	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	0.00500	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	0.0745	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.370	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	0.0264	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	0.0201	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	<0.0300	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239606	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	7400	mg/kg	DB, DC	100	UKAS	LE	531

Fluoride, Leachable : Dry Wt	2.80	mg/kg	DB, DC	0.5	UKAS	LE	531
pH, Leachable	8.88	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	13400	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	72.8	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING 0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: Sediment Hazrdous WAC.

Folder No: 004223155

Sampled on: 17-Aug-18 @ (Time not supplied)

Comments: Sample 37 Depth 0.00

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Moisture Content, Air dried 105 C	48.7	%			None	NLS	864
Acid Neutralisation Capacity (pH 4) : Dry Wt	2.13	mol/kg		0.3	UKAS	LE	741
Acid Neutralisation Capacity (pH 7) : Dry Wt	<0.6	mol/kg		0.3	UKAS	LE	741
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 105°C	51.3	%	QB	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	8.87	%	QB	0.5	UKAS	LE	911
Conductivity : Solid sample	8.20	mS/cm	DB, DC, QB	0.02	UKAS	LE	908
pH : Solid sample	8.52	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	1.81	%		0.1	UKAS	LE	535
Bromide, Leachable : Dry Wt	68.1	mg/kg	DB, DC	3	UKAS	LE	1493
Sulphate, Leachable : Dry Wt as SO4	2210	mg/kg	DB, DC	50	UKAS	LE	1493
Conductivity at 20C, Leachable	5760	uS/cm	DB, DC	100	UKAS	LE	446
Carbon, Organic, Dissolved, Leachable : Dry Wt as C	361	mg/kg		2	UKAS	LE	461
Antimony, Leachable : Dry Wt	0.0399	mg/kg		0.01	UKAS	LE	1483
Arsenic, Leachable :Dry Wt	0.0998	mg/kg		0.008	UKAS	LE	1483
Barium, Leachable : Dry Wt	0.104	mg/kg		0.1	UKAS	LE	1483
Cadmium, Leachable : Dry Wt	<0.00100	mg/kg		0.001	UKAS	LE	1483
Chromium, Leachable : Dry Wt	0.00940	mg/kg		0.005	UKAS	LE	1483
Copper, Leachable : Dry Wt	0.198	mg/kg		0.01	UKAS	LE	1483
Lead, Leachable : Dry Wt	<0.0200	mg/kg		0.02	UKAS	LE	1483
Molybdenum, Leachable : Dry Wt	0.414	mg/kg		0.02	UKAS	LE	1483
Nickel, Leachable : Dry Wt	0.0503	mg/kg		0.01	UKAS	LE	1483
Selenium, Leachable : Dry Wt	0.0148	mg/kg		0.01	UKAS	LE	1483
Zinc, Leachable : Dry Wt	0.0330	mg/kg		0.03	UKAS	LE	1483
BS EN 12457-2 one stage 10:1 leach test mgkg	1	Coded		0	None	LE	503
Dry weight @ 105	100	%		0.5	None	LE	503
Leaching BatchNo	20125580	Unitless			None	LE	503
Leaching Method	3	Coded		0	UKAS	LE	503
Soil Proportion Used	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate Dilution	NoResult	Unitless		0	None	LE	503
Stage 1 Leachate FolderNo	004239607	N/A			None	LE	503
Stage 2 Leachate FolderNo	NoResult	N/A			None	LE	503
Volume of Stage 1 eluate	NoResult	ml		0	None	LE	503
Wet sample weight	90.0	g		0	None	LE	503
Mercury Leachable : Dry Wt	<0.000100	mg/kg		0.0001	UKAS	LE	508
Chloride, Leachable : Dry Wt	18400	mg/kg	DB, DC	100	UKAS	LE	531

Fluoride, Leachable : Dry Wt	11.4	mg/kg	DB, DC	0.5	UKAS	LE	531
pH, Leachable	8.22	pH Units	DB, DC	0.5	UKAS	LE	549
Phenols, Monohydric Leachable : Dry Wt	<0.400	mg/kg	DB, DC	0.4	None	LE	554
Total Dissolved Solids Leachable : Dry Wt	39200	mg/kg		1	UKAS	LE	608
Dry Solids @ 30°C	54.4	%		0.5	None	LE	1130
Accreditation Assessment	2	No.		1	None	LE	924
Additional Material Present	Report	Text			None	LE	924
Plant material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Jaw Crushed & Sieved to <2mm							

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20124893 - 2

UKAS TESTING
0754

Batch description: Sediment samples from Dublin Port Eire Additional Works

Reported on: 15-Oct-2018

Method Description Summary for all samples in batch Number 20124893

446	Conductivity (leach) - determined by specific conductivity electrode; from "as received" sample
461	DOC (leach) - by colorimetry; DW result calculated; from "as received" sample
503	LE P Leachability 01 - Leaching method - (2)-12457-1 (1stg,2:1); (3)-12457-2 (1-stg,10:1); (4)-12457-3 (2-stg,2+8:1); from "as received" sample
508	Mercury (leach) - by CV-AFS; DW result calculated; from"as received" sample
531	Nutrients (leach) - by colorimetry; DW result calculated; from "as received" sample
535	LE I TOC 01 - combusted with oxygen; thermal conductivity detection
549	pH (leach) - by pH electrode; from "as received" sample
554	Phenols (leach) - 4AMP reaction; by colorimetry; DW result calculated; from "as received" sample
608	TDS (leach) - by gravimetry; DW result calculated; from "as received" sample
741	LE I ANC 01 - acid titrated to pH 4 or 7; determined by pH electrode; from "as received" sample
864	Parameter by calculation
908	LE I pH & EC - pH, Conductivity - water extracted; determined by specific electrode; from "as received" sample
911	LE I Dry Solids & LoI 01 - Dry Solids (105C), Loss on Ignition (500C) - thermally treated; determined by gravimetry
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.
1483	Not Available
1493	Anions Leach - Determined by IC, DW result calculated, from as received sample

Steve Moss
Laboratory Site Manager

'The results in this Certificate of Analysis are the definitive test results. Any accompanying results are provided for ease of use by the customer and should be used with caution.

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 quoted and will be above the MRV.
Minimum Reporting Value (MRV). A minimum concentration selected for reporting purposes (i.e. the less than value), which is higher than the statistically derived method limit of detection.

Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Uncertainty of Measurement information relating to sample results is supplied upon request. Uncertainty is estimated from the performance of routine quality control standards, using the calculation 2 X Relative Standard Deviation + Bias. This is based on the guidance issued by the UKTAG Chemistry task team - Guidance on the implementation of the Quality Assurance/Quality Control requirements' associated with Commission Directive 2009/90/EC, Article 4 (UoM = 2 X %RSD), with a contribution added for the bias.

Key to Results Flags:

DB Samples received outside specified stability times. It is possible that the results may be compromised.

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

QB QC Flag. Result accepted against QC breach

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

Key to WAC Leach Test WAC Leach test : 1 = BS 1377 leach test , 2 = single stage l/s 2:1 BS EN 12457-1 leaching test , 3 = single stage l/s 10:1 BS EN 12457-2 leaching test , 4 = double stage l/s 10:1 BS EN 12457-3 leaching test

END OF TEST REPORT

National Laboratory Service

Analytical Report

Final Report

Report ID - 20126156 - 1

Batch description: CRM

0754

Reported on:
25-Oct-2018

Karen Blackmore
Fugro GeoServices Ltd
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Dear Karen

Please find attached the results for the batch of 2 samples described below.

Samples Registered on:	16-Oct-2018
Analysis Started on:	27-Sep-2018
Analysis Completed on:	25-Oct-2018
Results for Batch Number	20126156
Your Purchase Order Number:	None Supplied

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

Lawrence Green
Customer Services Team Manager
Tel: 0800 092 0786
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report

Report ID - 20126156 - 1

Batch description: CRM

UKAS TESTING 0754

Reported on: 25-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: CRM / LRM Only.

Folder No: 004246377

Sampled on: 10-Aug-18 @ (Time not supplied)

Comments: CRM

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg	DB			NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	0.00	mg/kg	DB		None	NLS	864
pH : Solid sample	NoResult	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	5.16	%	DB, DC	0.1	UKAS	LE	535
Mercury : Dry Wt	NoResult	mg/kg	DB, DC	0.01	UKAS	LE	1042
Aluminium : Dry Wt	54400	mg/kg	DB, DC	20	UKAS	LE	1043
Arsenic : Dry Wt	19.7	mg/kg	DB, DC	1	UKAS	LE	1041
Cadmium : Dry Wt	0.218	mg/kg	DB, DC	0.04	UKAS	LE	1041
Chromium : Dry Wt	77.7	mg/kg	DB, DC	2	UKAS	LE	1041
Copper : Dry Wt	30.5	mg/kg	DB, DC	1	UKAS	LE	1041
Lead : Dry Wt	19.5	mg/kg	DB, DC	2	UKAS	LE	1041
Lithium : Dry Wt	62.3	mg/kg	DB, DC	0.3	None	LE	1041
Nickel : Dry Wt	39.0	mg/kg	DB, DC	1	UKAS	LE	1041
Zinc : Dry Wt	142	mg/kg	DB, DC	2.5	UKAS	LE	1041
Grain Size Fraction : <1000 microns : {>0 phi}	62.7	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	22.5	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	51.0	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	19.7	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	10.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	56.5	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	41.9	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	12.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	27.3	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	49.9	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	84.8	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	243	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	161	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	554	%	DB, DC	0	UKAS	LE	1369
Particle Size Report	Report	Text	DB, DC		UKAS	LE	1369
Raw Data Report	Report	Text	DB, DC		UKAS	LE	1369
Sorting Coefficient	NoResult	Unitless	DB, DC	0	UKAS	LE	1368
Particle Diameter : Median	NoResult	mm	DB, DC	0	UKAS	LE	1368
Grain Size Inclusive Mean	NoResult	mm	DB, DC	0	UKAS	LE	1368
Particle Diameter : Mean	NoResult	mm	DB, DC	0	UKAS	LE	1368
Kurtosis	NoResult	Unitless	DB, DC	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	NoResult	mm	DB, DC	0	UKAS	LE	1368

Inclusive Graphic Skewness :- {SKI}	NoResult	Unitless	DB, DC	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0200	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.170	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.220	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.240	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.280	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.300	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.260	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.260	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.370	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.570	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.780	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	1.46	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.40	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	11.6	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	19.9	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	23.5	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	18.1	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	9.86	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	4.35	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	3.34	%	DB, DC	0	UKAS	LE	1370
HCH -alpha : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -beta : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -delta : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	NoResult	ug/kg	DB, DC	0.1	None	LE	672
Acenaphthene : Dry Wt	27.6	ug/kg	DB, DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	19.8	ug/kg	DB, DC	1	None	LE	1051
Anthracene : Dry Wt	91.3	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	351	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	337	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	400	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	278	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	191	ug/kg	DB, DC	1	UKAS	LE	1051
Chrysene : Dry Wt	305	ug/kg	DB, DC	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	61.1	ug/kg	DB, DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	785	ug/kg	DB, DC	1	UKAS	LE	1051
Fluorene : Dry Wt	60.8	ug/kg	DB, DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	258	ug/kg	DB, DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	158	ug/kg	DB, DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	414	ug/kg	DB, DC	5	UKAS	LE	1051
Pyrene : Dry Wt	672	ug/kg	DB, DC	1	UKAS	LE	1051

PCB - 028 : Dry Wt	3.23	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	3.87	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	3.88	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	3.05	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	3.68	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	4.30	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	2.62	ug/kg	DB, DC	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	NoResult	mg/kg	DB, DC	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	NoResult	mg/kg	DB, DC	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	NoResult	mg/kg	DB, DC	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	622	ug/kg	DB, DC	3	None	LE	897
Tributyl Tin : Dry Wt as Cation	473	ug/kg	DB, DC	1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.30	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	NoResult	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	NoResult	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	NoResult	ug/kg	DB, DC	2	UKAS	LE	928

Ethylbenzene : Dry Wt	NoResult	ug/kg	DB, DC	0.5	UKAS	LE	928
Toluene : Dry Wt :- {Methylbenzene}	NoResult	ug/kg	DB, DC	3	UKAS	LE	928
Dry Solids @ 30°C	100	%		0.5	None	LE	1130
Extended Sample Description	Report	Text	DB, DC		None	LE	1067
Accreditation Assessment	NoResult	No.		1	None	LE	924
Additional Material Present	Report	Text		0	None	LE	924
Drying Method	Report	Text		0	None	LE	924
Rejected Matter Description	Report	Text		0	None	LE	924
Sample Colour	Report	Text		0	None	LE	924
Sample Matrix	Report	Text		0	None	LE	924
Sample Preparation	Report	Text		0	None	LE	924

National Laboratory Service

Analytical Report

Final Report

Report ID - 20126156 - 1

Batch description: CRM

UKAS TESTING 0754

Reported on: 25-Oct-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: CRM / LRM Only.

Folder No: 004246378

Sampled on: 10-Aug-18 @ (Time not supplied)

Comments: CRM

Quote No:

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
HCH : Total Isomers (a+b+g+d+e) : Dry Wt	NoResult	ug/kg	DB			NLS	864
Total Benzene Toluene Ethylbenzene and Xylene : Dry Wt	0.00	mg/kg	DB		None	NLS	864
pH : Solid sample	NoResult	pH Units	DB, DC	4	UKAS	LE	908
Carbon, Organic : Dry Wt as C	5.20	%	DB, DC	0.1	UKAS	LE	535
Mercury : Dry Wt	NoResult	mg/kg	DB, DC	0.01	UKAS	LE	1042
Aluminium : Dry Wt	61500	mg/kg	DB, DC	20	UKAS	LE	1043
Arsenic : Dry Wt	19.3	mg/kg	DB, DC	1	UKAS	LE	1041
Cadmium : Dry Wt	0.210	mg/kg	DB, DC	0.04	UKAS	LE	1041
Chromium : Dry Wt	77.9	mg/kg	DB, DC	2	UKAS	LE	1041
Copper : Dry Wt	28.8	mg/kg	DB, DC	1	UKAS	LE	1041
Lead : Dry Wt	18.7	mg/kg	DB, DC	2	UKAS	LE	1041
Lithium : Dry Wt	66.9	mg/kg	DB, DC	0.3	None	LE	1041
Nickel : Dry Wt	37.3	mg/kg	DB, DC	1	UKAS	LE	1041
Zinc : Dry Wt	138	mg/kg	DB, DC	2.5	UKAS	LE	1041
Grain Size Fraction : <1000 microns : {>0 phi}	62.4	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	23.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	51.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	19.8	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	10.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	56.5	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	41.9	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	12.1	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	27.3	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	49.7	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	84.8	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	243	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	161	%	DB, DC	0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	554	%	DB, DC	0	UKAS	LE	1369
Particle Size Report	Report	Text	DB, DC		UKAS	LE	1369
Raw Data Report	Report	Text	DB, DC		UKAS	LE	1369
Sorting Coefficient	NoResult	Unitless	DB, DC	0	UKAS	LE	1368
Particle Diameter : Median	NoResult	mm	DB, DC	0	UKAS	LE	1368
Grain Size Inclusive Mean	NoResult	mm	DB, DC	0	UKAS	LE	1368
Particle Diameter : Mean	NoResult	mm	DB, DC	0	UKAS	LE	1368
Kurtosis	NoResult	Unitless	DB, DC	0	UKAS	LE	1368
Grain Size Inclusive Kurtosis	NoResult	mm	DB, DC	0	UKAS	LE	1368

Inclusive Graphic Skewness :- {SKI}	NoResult	Unitless	DB, DC	-5	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	4.94	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	4.34	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	5.37	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	7.10	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	9.34	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	9.66	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	10.5	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	10.8	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	10.0	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	9.11	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.06	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.65	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	3.12	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	2.20	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	1.30	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	0.450	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	0.0300	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.00	%	DB, DC	0	UKAS	LE	1370
HCH -alpha : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -beta : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -delta : Dry Wt	NoResult	ug/kg	DB, DC	0.1	None	LE	672
HCH -gamma : Dry Wt :- {Lindane}	NoResult	ug/kg	DB, DC	0.1	None	LE	672
Acenaphthene : Dry Wt	30.8	ug/kg	DB, DC	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	22.3	ug/kg	DB, DC	1	None	LE	1051
Anthracene : Dry Wt	92.4	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	339	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	332	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	398	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	267	ug/kg	DB, DC	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	192	ug/kg	DB, DC	1	UKAS	LE	1051
Chrysene : Dry Wt	309	ug/kg	DB, DC	3	UKAS	LE	1051
Dibenzo(ah)anthracene : Dry Wt	59.5	ug/kg	DB, DC	1	UKAS	LE	1051
Fluoranthene : Dry Wt	790	ug/kg	DB, DC	1	UKAS	LE	1051
Fluorene : Dry Wt	62.5	ug/kg	DB, DC	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	252	ug/kg	DB, DC	1	UKAS	LE	1051
Naphthalene : Dry Wt	180	ug/kg	DB, DC	5	UKAS	LE	1051
Phenanthrene : Dry Wt	449	ug/kg	DB, DC	5	UKAS	LE	1051
Pyrene : Dry Wt	672	ug/kg	DB, DC	1	UKAS	LE	1051

PCB - 028 : Dry Wt	3.70	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	4.44	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	4.20	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	3.59	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	2.69	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	3.87	ug/kg	DB, DC	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	2.70	ug/kg	DB, DC	0.1	UKAS	LE	685
Hydrocarbons >C10 - C12 : Dry Wt	NoResult	mg/kg	DB, DC	10	None	LE	1111
Hydrocarbons >C10 - C20 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C10 - C24 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C10 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C12 - C16 : Dry Wt	NoResult	mg/kg	DB, DC	10	None	LE	1111
Hydrocarbons >C16 - C21 : Dry Wt	NoResult	mg/kg	DB, DC	30	None	LE	1111
Hydrocarbons >C20 - C30 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C20 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C20 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C21 - C35 : Dry Wt	NoResult	mg/kg	DB, DC	50	None	LE	1111
Hydrocarbons >C24 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C24 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	60	None	LE	1111
Hydrocarbons >C30 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	40	None	LE	1111
Hydrocarbons >C35 - C40 : Dry Wt	NoResult	mg/kg	DB, DC	20	None	LE	1111
Hydrocarbons >C35 - C44 : Dry Wt	NoResult	mg/kg	DB, DC	20	None	LE	1111
Dibutyl Tin : Dry Wt as Cation	641	ug/kg	DB, DC	3	None	LE	897
Tributyl Tin : Dry Wt as Cation	477	ug/kg	DB, DC	1	None	LE	897
Hydrocarbons >C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C5 - C6 : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C6 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C5 - C8 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C5-C7 Aromatic fraction: Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
Hydrocarbons >C6 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C6 - C7 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C6 - C7 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	2	None	LE	927
Hydrocarbons >C7 - C8 : Dry Wt	NoResult	mg/kg	DB, DC	3	None	LE	927
Hydrocarbons >C7 - C8 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.30	None	LE	927
Hydrocarbons >C7 - C8 Aromatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.001	None	LE	927
Hydrocarbons >C8 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons >C8 - C10 Aliphatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.7	None	LE	927
Hydrocarbons >C8 - C10 Aromatic fraction : Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
Hydrocarbons, Aliphatic volatile C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	4	None	LE	927
Hydrocarbons, Aromatic volatile C5 - C10 : Dry Wt	NoResult	mg/kg	DB, DC	0.010	None	LE	927
1,2-Dimethylbenzene : Dry Wt :- {o-Xylene}	NoResult	ug/kg	DB, DC	1	UKAS	LE	928
Benzene : Dry Wt	NoResult	ug/kg	DB, DC	1	UKAS	LE	928
Dimethylbenzene : Sum of (1,3- 1,4-) : Dry Wt	NoResult	ug/kg	DB, DC	2	UKAS	LE	928

Ethylbenzene : Dry Wt	NoResult	ug/kg	DB, DC	0.5	UKAS	LE	928
Toluene : Dry Wt :- {Methylbenzene}	NoResult	ug/kg	DB, DC	3	UKAS	LE	928
Dry Solids @ 30°C	100	%		0.5	None	LE	1130
Extended Sample Description	Report	Text	DB, DC		None	LE	1067
Accreditation Assessment	NoResult	No.		1	None	LE	924
Additional Material Present	Report	Text		0	None	LE	924
Drying Method	Report	Text		0	None	LE	924
Rejected Matter Description	Report	Text		0	None	LE	924
Sample Colour	Report	Text		0	None	LE	924
Sample Matrix	Report	Text		0	None	LE	924
Sample Preparation	Report	Text		0	None	LE	924

National Laboratory Service

Analytical Report

Final Report

Report ID - 20126156 - 1

Batch description: CRM

0754

Reported on:
25-Oct-2018

Method Description Summary for all samples in batch Number 20126156

535	LE I TOC 01 - combusted with oxygen; thermal conductivity detection
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
864	Parameter by calculation
897	LE O Organotins (GCMS) 01 - acetic acid/methanol extracted; derivatised; determined GCMS (SIM); from "as received" sample
908	LE I pH & EC - pH, Conductivity - water extracted; determined by specific electrode; from "as received" sample
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
927	LE O VPH >C5-C10 GCMS)01
928	LE O VOC (GCMS) 01 - water extracted; gently heated; determined by HS-GCMS (SIM); from "as received" sample
1041	LE M Metals ICP-MS Sediment - microwave aqua regia digested, determined by ICPMS, samples are sieved to <2000um.
1042	LE M Mercury CSEMP - microwave aqua regia digeste, acidic SnCl2 reduced, determined by CV-AFS. Samples are sieved to <2000um.
1043	LE M Metals Marine (ICPOES) - microwave aqua regia digested, determined by ICPOES, samples are sieved to <2000um.
1051	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
1067	Sample Description of "as received" sample
1111	LE O EPH >C5-C44 (GC-FID) 01 - Hydrocarbon screen including arom/aliph banding by GC-FID; from "as received" sample
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.
1368	LE P Particle Size Sediment by Laser Diffraction - various parameters calculated from the band sizes produced by laser beam diffraction technique
1369	LE P Particle Size Sediment Sieve - various band sizes >1000mm - determined by manual sieving.
1370	LE P Particle Size Sediment by Laser Diffraction - various band sizes <1000mm - determined by laser beam diffraction instrumentation.

Steve Moss
Laboratory Site Manager

'The results in this Certificate of Analysis are the definitive test results. Any accompanying results are provided for ease of use by the customer and should be used with caution.

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 quoted and will be above the MRV.
Minimum Reporting Value (MRV). A minimum concentration selected for reporting purposes (i.e. the less than value), which is higher than the statistically derived method limit of detection.

Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Uncertainty of Measurement information relating to sample results is supplied upon request. Uncertainty is estimated from the performance of routine quality control standards, using the calculation 2 X Relative Standard Deviation + Bias. This is based on the guidance issued by the UKTAG Chemistry task team - Guidance on the implementation of the Quality Assurance/Quality Control requirements' associated with Commission Directive 2009/90/EC, Article 4 (UoM = 2 X %RSD), with a contribution added for the bias.

Key to Results Flags:

DB Samples received outside specified stability times. It is possible that the results may be compromised.

DC Analysis started outside of specified stability 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

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on:
21-Nov-2018

Karen Blackmore
Fugro GeoServices Ltd
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Dear Karen

Please find attached the results for the batch of 36 samples described below.

Samples Registered on:	19-Nov-2018
Analysis Started on:	17-Sep-2018
Analysis Completed on:	20-Nov-2018
Results for Batch Number	20127158
Your Purchase Order Number:	None Supplied

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

Lawrence Green
Customer Services Team Manager
Tel: 0800 092 0786
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272214

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 31 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.246	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.326	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272215

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 34 5.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272216

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 33 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.329	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.522	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272217

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 37 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.611	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.995	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272218

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 17 5.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.630	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.666	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272219

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 35 5.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.135	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.353	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272220

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 36 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.607	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	1.21	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272221

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 13 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.107	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272222

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 10 8.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272223

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 5 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.143	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272224

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 2 2.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.629	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.545	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272225

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 1 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.223	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.196	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272226

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 14 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.111	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.114	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272227

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 19 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272228

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 12 2.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.876	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.823	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272229

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 32 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.250	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.311	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272230

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 15 2.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.354	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.435	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272231

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 25 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.191	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.218	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272232

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 43 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.280	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.508	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272233

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 4 2.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272234

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 3 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.265	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.407	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272235

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 6 3.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	1.52	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	0.120	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	1.22	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272236

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 41 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.642	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.950	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272237

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 7 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.558	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.366	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272238

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 39 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.614	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.902	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272239

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 38 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	1.61	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	0.151	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	2.18	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272240

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 40 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.594	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.793	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272241

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 42 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.160	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.195	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272242

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 27 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.139	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.158	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272243

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 18 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.140	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.157	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272244

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 9 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.104	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.123	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272245

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 8 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.152	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.153	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272246

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 11 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.116	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.119	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272247

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 29 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.399	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.495	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272248

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 21 8.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Client: Fugro GeoServices Ltd

Project: 15304 Dublin Additional

Quote Description: DDT, DDD, DDE and DDX

Folder No: 004272249

Sampled on: 1-Aug-18 @ (Time not supplied)

Comments: Sample 30 0.00m

Quote No: 15426

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
DDE -pp : Dry Wt	0.287	ug/kg		0.1	None	LE	672
DDT -op : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg		0.1	None	LE	672
TDE - pp : Dry Wt	0.303	ug/kg		0.1	None	LE	672
Dry Solids @ 30°C	NoResult	%				LE	1130
Accreditation Assessment	NoResult	No.				LE	924
Additional Material Present	Report	Text				LE	924
Drying Method	Report	Text				LE	924
Rejected Matter Description	Report	Text				LE	924
Sample Colour	Report	Text				LE	924
Sample Matrix	Report	Text				LE	924
Sample Preparation	Report	Text				LE	924

National Laboratory Service

Analytical Report

Final Report - Amended - Issue 2

Report ID - 20127158 - 2

Batch description: Fugro OCP

Reported on: 21-Nov-2018

Method Description Summary for all samples in batch Number 20127158

672	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
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

'The results in this Certificate of Analysis are the definitive test results. Any accompanying results are provided for ease of use by the customer and should be used with caution.

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 quoted and will be above the MRV.
Minimum Reporting Value (MRV). A minimum concentration selected for reporting purposes (i.e. the less than value), which is higher than the statistically derived method limit of detection.

Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Uncertainty of Measurement information relating to sample results is supplied upon request. Uncertainty is estimated from the performance of routine quality control standards, using the calculation 2 X Relative Standard Deviation + Bias. This is based on the guidance issued by the UKTAG Chemistry task team - Guidance on the implementation of the Quality Assurance/Quality Control requirements' associated with Commission Directive 2009/90/EC, Article 4 (UoM = 2 X %RSD), with a contribution added for the bias.

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

NLS Leeds
Olympia House
Gelderd Lane
Gelderd Road
Leeds LS12 6DD

NLS Nottingham
Meadow Lane
Nottingham
NG2 3HN

NLS Starcross
Staplake Mount
Starcross
Exeter
EX6 8FD

Environment Agency

E. SURVEY

Mean Position Reports 50 Pages

Note; A small number of the chosen locations for Grab Sampling were immediately adjacent to drilling positions. Grab sampling operations in these cases occurred without moving the JUB and use the same waypoint and MPR as the adjacent borehole. Sample 5 uses BL-BH75 as its reference, and Sample 17 uses BL-BH59.

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	D/ML =7.00 D/WL =0.5 D-ODM 2.2 D-CD 4.7		

Session Name: Goose Map 20180813-113459 Records Used: 300 of 300

Start Time: 13 Aug 2018, 12:34:59+01:00 End Time: 13 Aug 2018, 12:39:58+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34220°N	53.34220°N
Longitude	6.16959°W	6.16959°W
Height	58.168m Ell.	58.168m Ell.
Easting	721,886.621m E (SD: ±0.01m)	
Northing	734,002.918m N (SD: ±0.02m)	
Height	1.888m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	242.06°T 240.59°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	1
Easting	721,886.274m E
Northing	734,003.018m N
Range	0.36m Geodetic
Bearing TO	287.50°True
Bearing FROM	107.50°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=7.8M DWL=0.7M D-CD=4.9m D-ODM 2.4m		

Session Name: Goose Map 20180813-123837 Records Used: 300 of 300

Start Time: 13 Aug 2018, 13:38:37+01:00 End Time: 13 Aug 2018, 13:43:37+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34236°N	53.34236°N
Longitude	6.17148°W	6.17148°W
Height	58.440m Ell.	58.440m Ell.
Easting	721,760.465m E (SD: ±0.02m)	
Northing	734,018.016m N (SD: ±0.06m)	
Height	2.158m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	285.27°T 283.81°G	±0.3°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	2
Easting	721,758.644m E
Northing	734,017.560m N
Range	1.88m Geodetic
Bearing TO	257.43°True
Bearing FROM	77.43°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

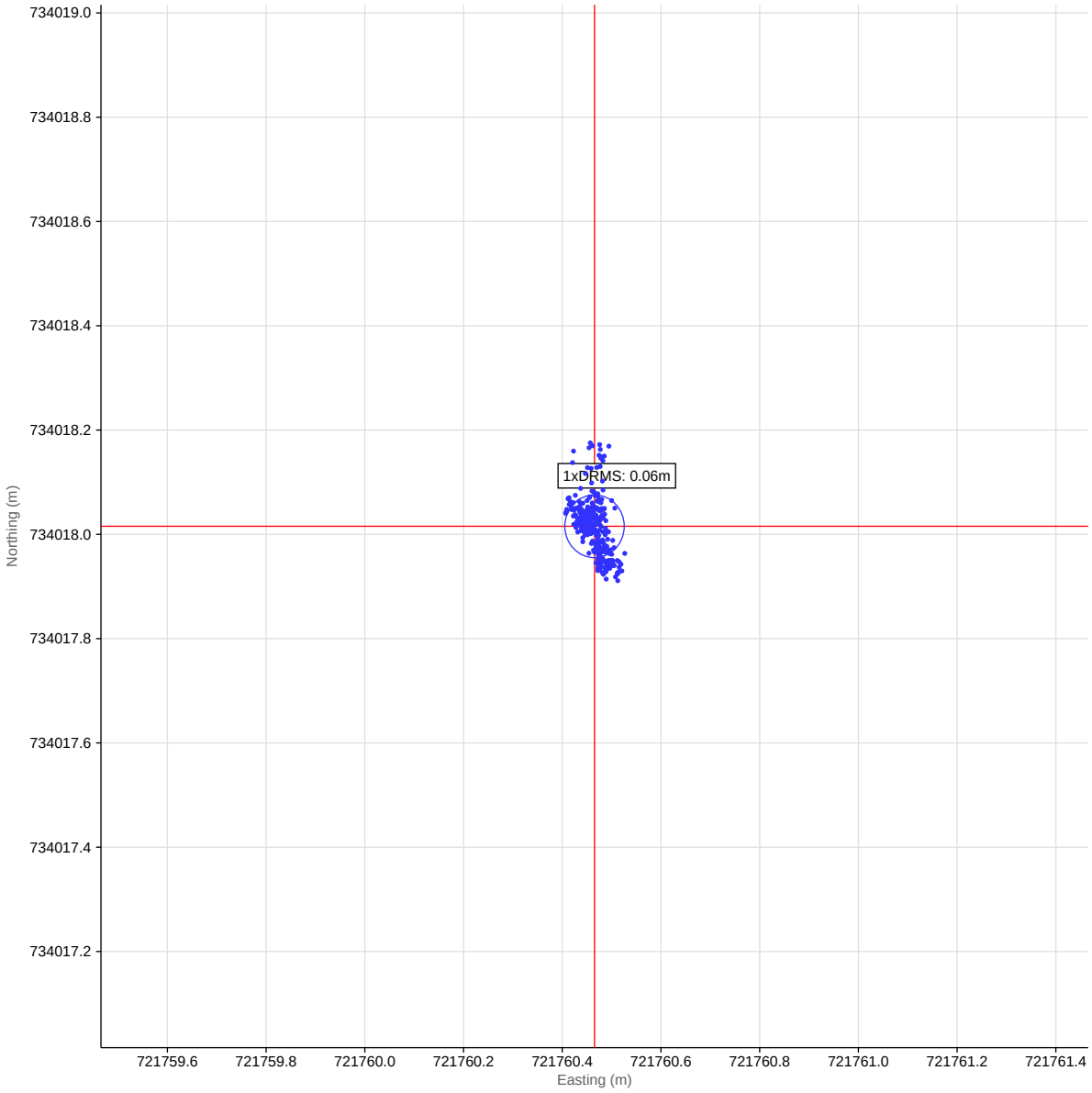
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

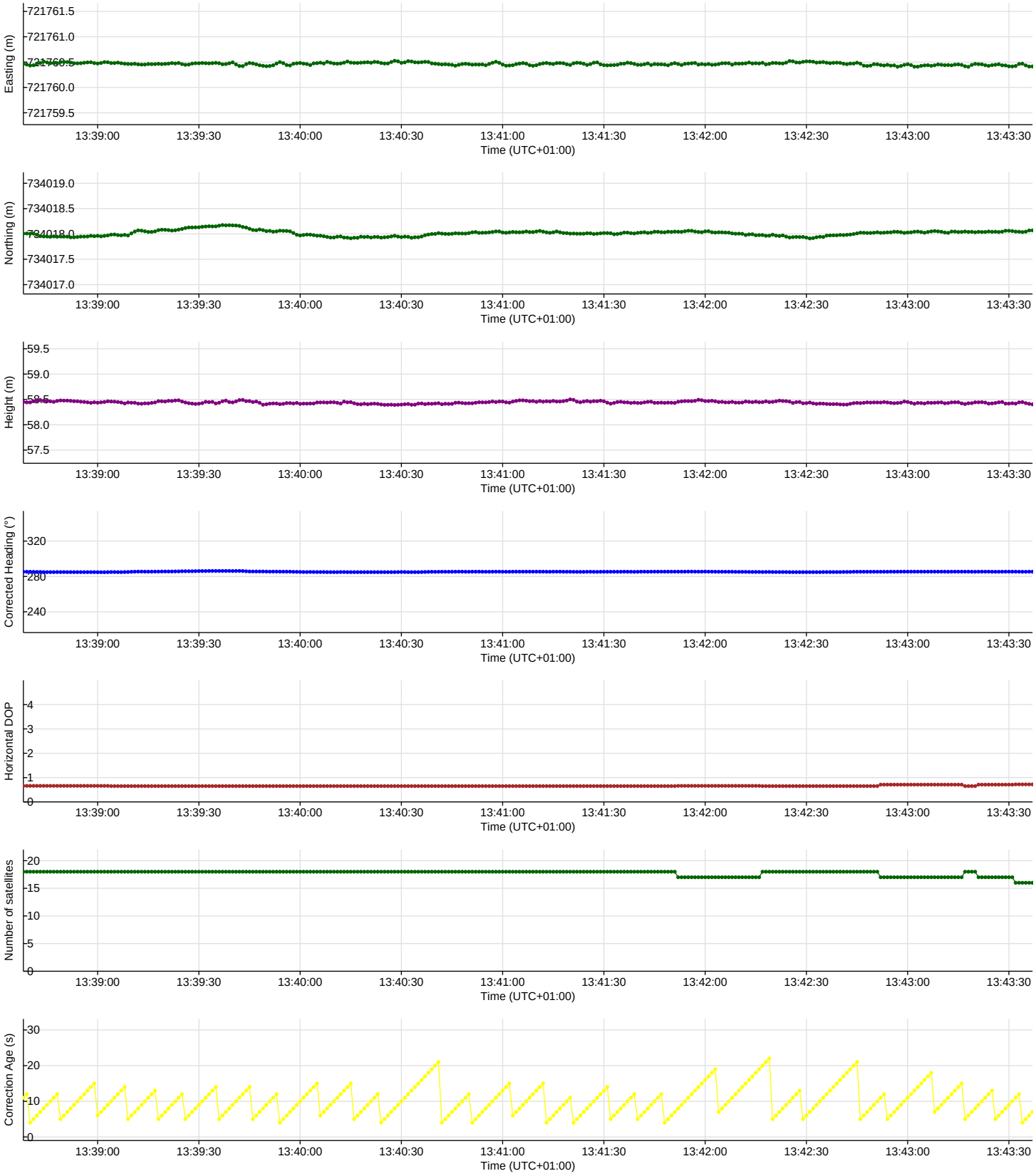
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,760.465m E	734,018.016m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM= 7.2 DTW= 0.7 D-ODM= 0.4m D-CD= 2.8m		

Session Name: Goose Map 20180813-131201 Records Used: 300 of 300

Start Time: 13 Aug 2018, 14:12:01+01:00 End Time: 13 Aug 2018, 14:17:01+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34220°N	53.34220°N
Longitude	6.17327°W	6.17327°W
Height	58.396m Ell.	58.396m Ell.
Easting	721,642.201m E (SD: ±0.03m)	
Northing	733,997.042m N (SD: ±0.04m)	
Height	2.112m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	261.05°T 259.58°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	3
Easting	721,642.579m E
Northing	733,996.776m N
Range	0.46m Geodetic
Bearing TO	126.58°True
Bearing FROM	306.58°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=6.4M DWL= 5.8M CD= 6.2M ODM= 3.7M		

Session Name: Goose Map 20180815-071310 Records Used: 300 of 300

Start Time: 15 Aug 2018, 08:13:10+01:00 End Time: 15 Aug 2018, 08:18:10+01:00 Session Length: 00:05:00

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34136°N	53.34136°N
Longitude	6.17450°W	6.17450°W
Height	59.659m Ell.	59.659m Ell.
Easting	721,562.636m E (SD: ±0.01m)	
Northing	733,900.892m N (SD: ±0.01m)	
Height	3.374m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	63.39°T 61.93°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	4
Easting	721,563.071m E
Northing	733,901.226m N
Range	0.55m Geodetic
Bearing TO	53.90°True
Bearing FROM	233.90°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

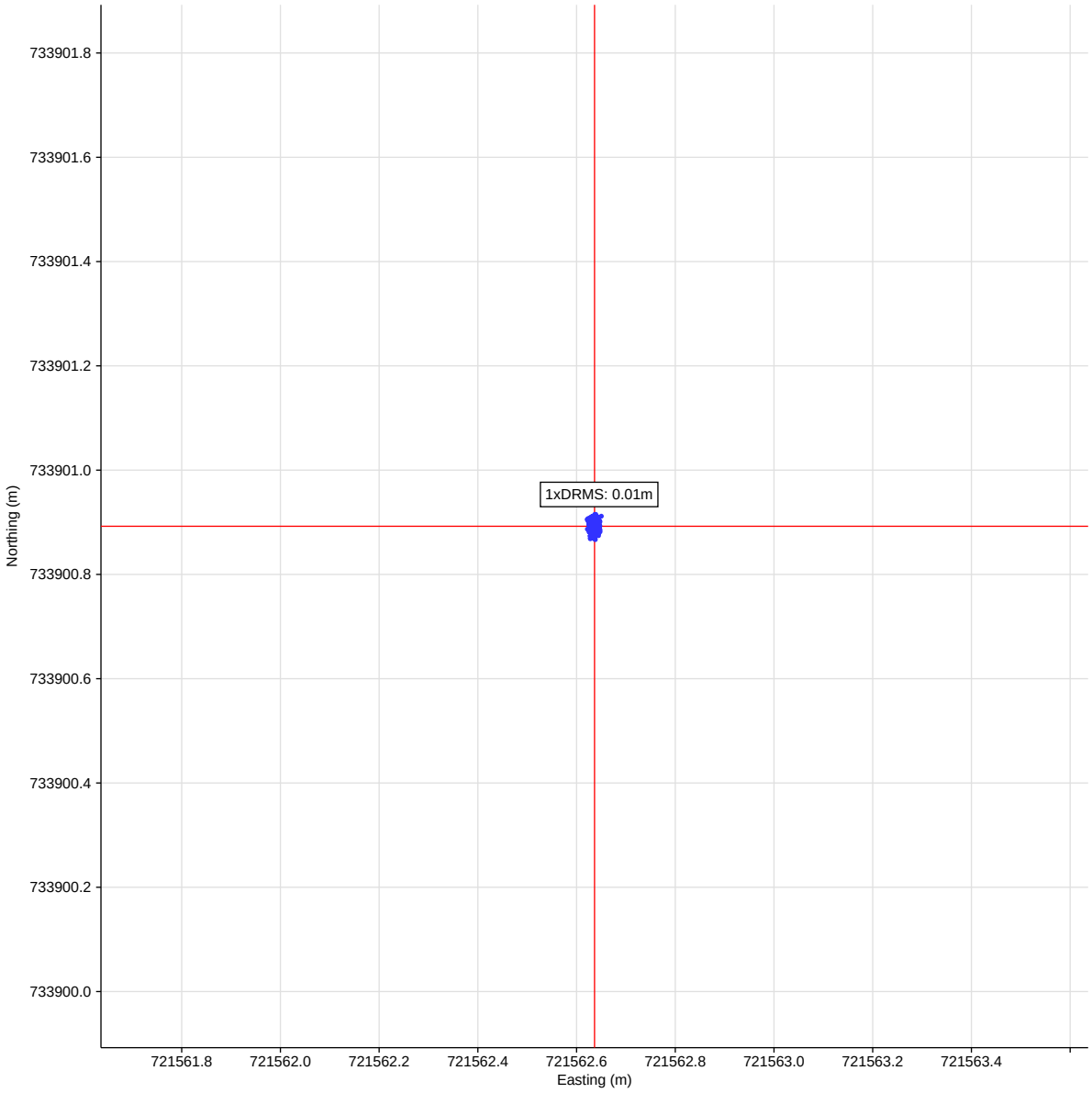
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

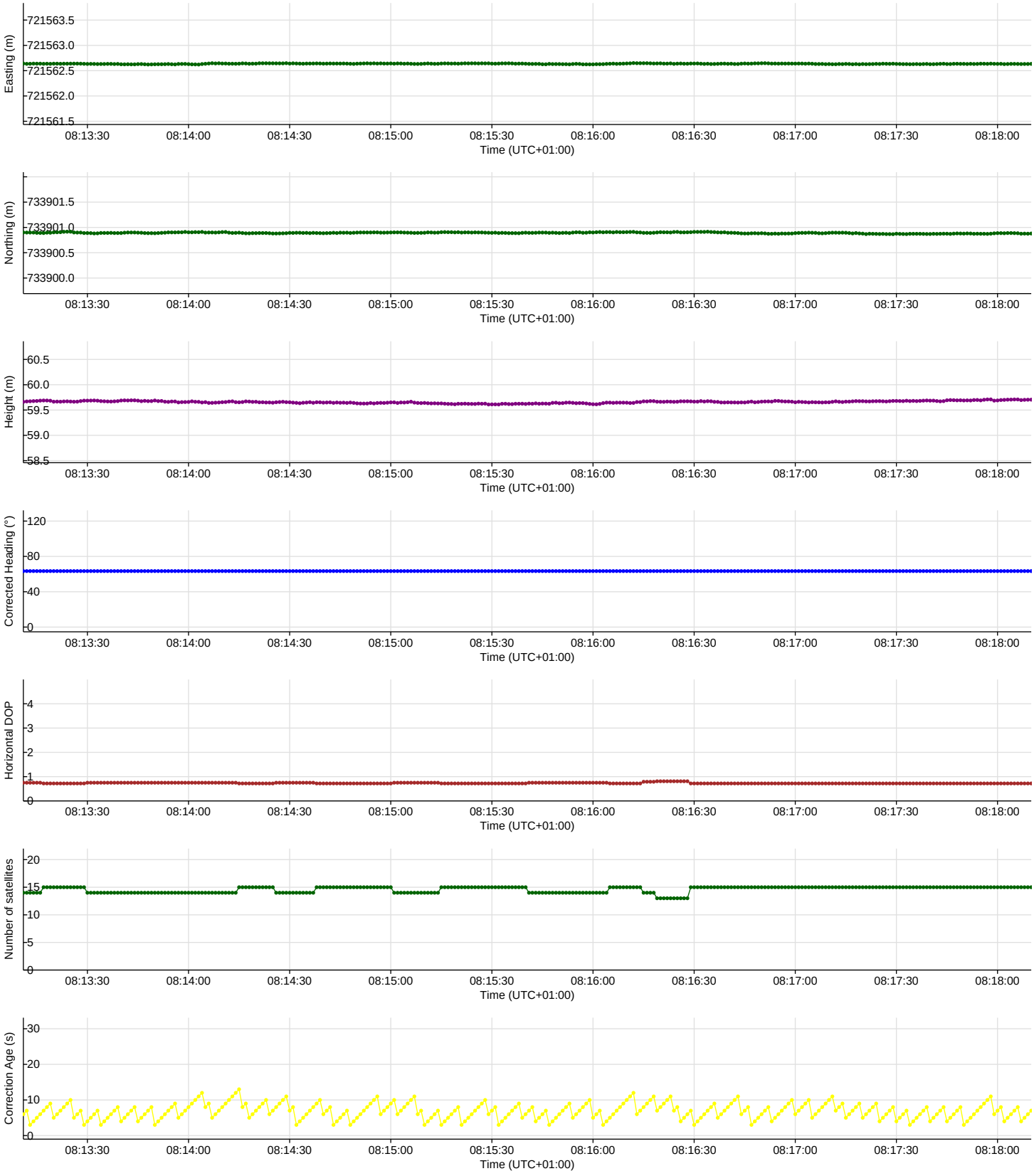
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,562.636m E	733,900.892m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=6.3M DWL=3.6M D-ODM=3.9m D-CD=6.4m		

Session Name: 20180810-125508 Records Used: 300 of 300

Start Time: 10 Aug 2018, 13:59:13+01:00 End Time: 10 Aug 2018, 14:04:14+01:00 Session Length: 00:05:01

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34131°N	53.34131°N
Longitude	6.17566°W	6.17566°W
Height	59.902m Ell.	59.902m Ell.
Easting	721,485.199m E(SD: ±0.01m)	
Northing	733,893.244m N(SD: ±0.02m)	
Height	3.615m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	142.99°T 141.53°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	BL-BH75
Easting	721,484.010m E
Northing	733,892.530m N
Range	1.39m Geodetic
Bearing TO	240.49°True
Bearing FROM	60.49°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

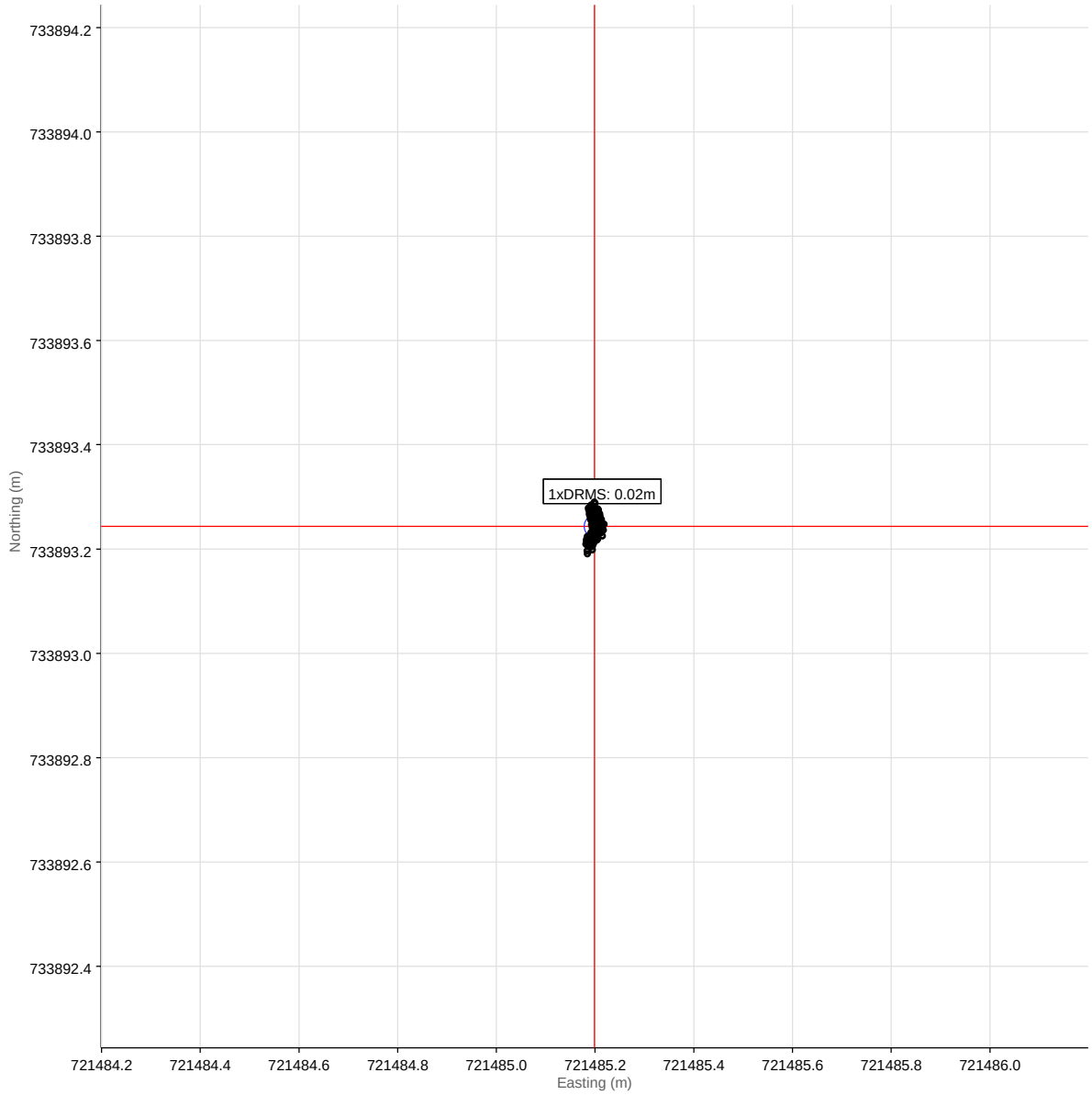
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

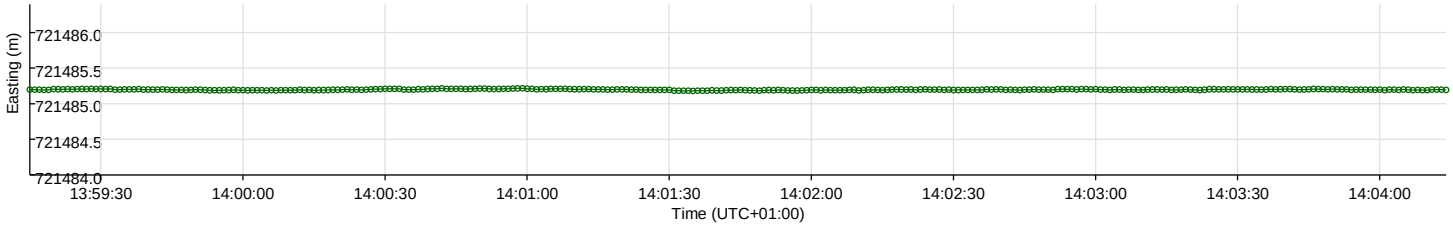
Scatter Plot

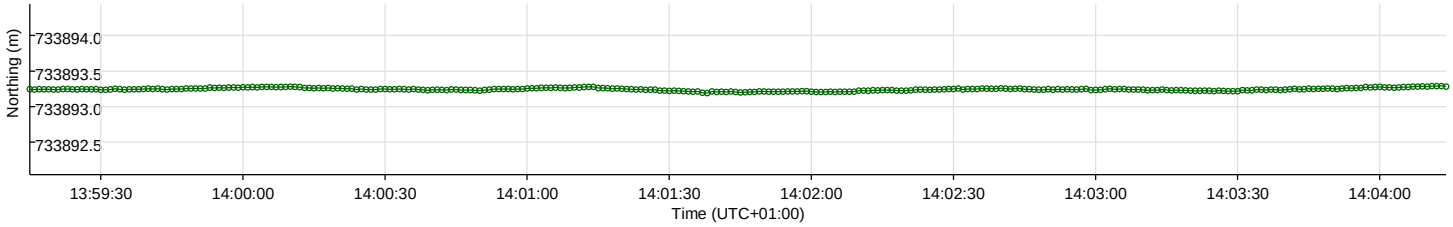


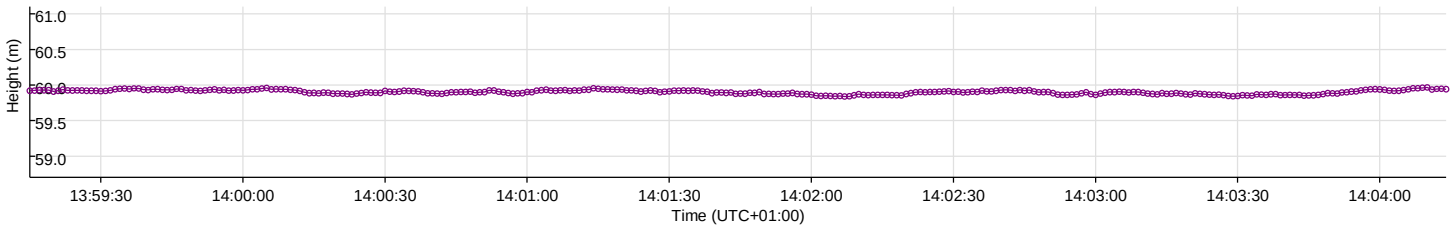
Mean Position

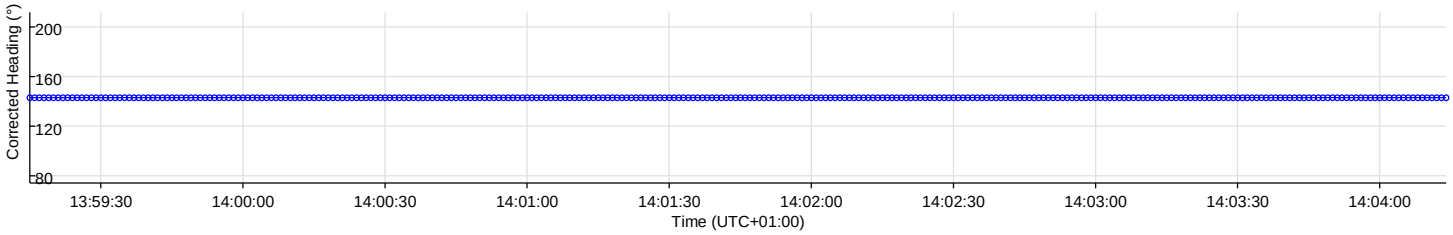
	Easting	Northing
Aran 120A	721,485.199m E	733,893.244m N

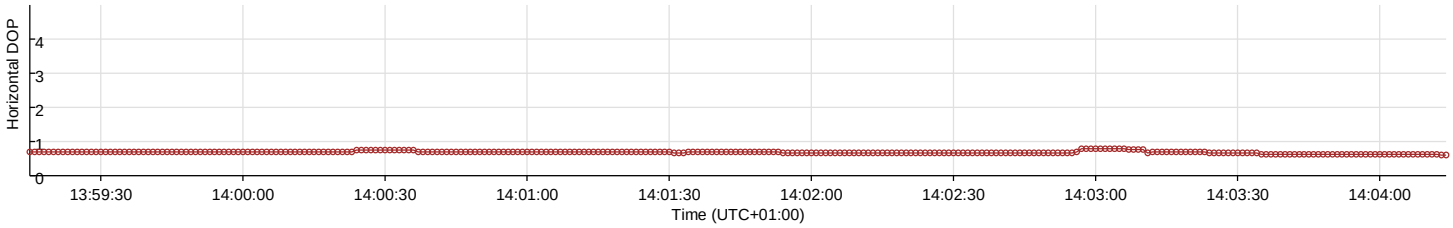
Time Series Plots for Aran 120A

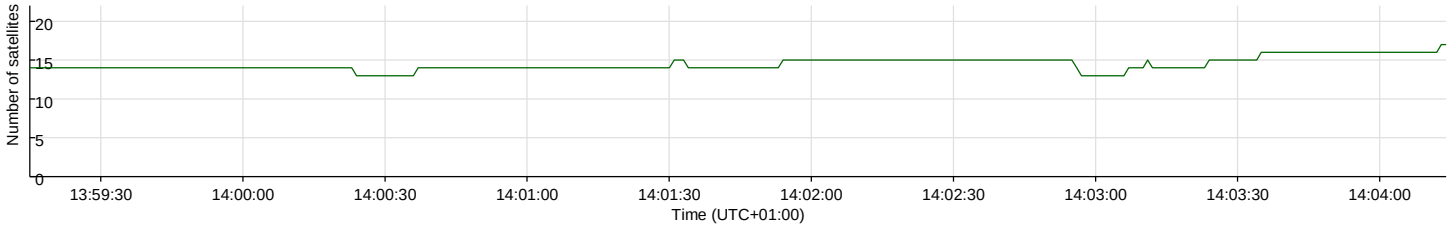


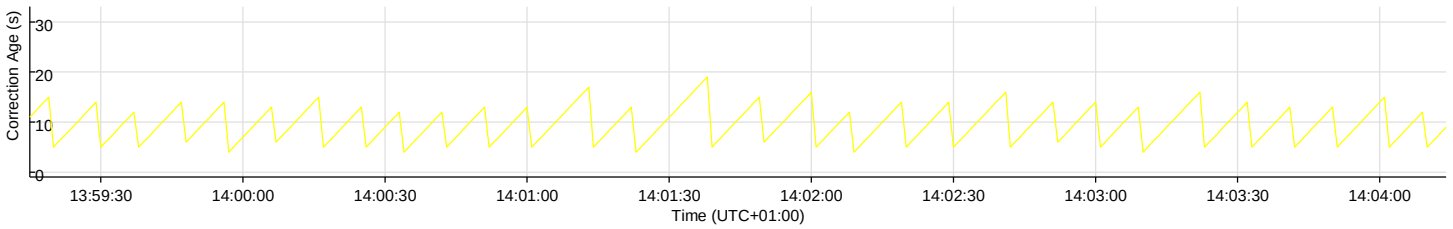












STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=9.5M DWL=4.5M D-ODM=4.1m D-CD=6.6m		

Session Name: Goose Map 20180813-155249 Records Used: 300 of 300

Start Time: 13 Aug 2018, 16:52:49+01:00 End Time: 13 Aug 2018, 16:57:49+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34228°N	53.34228°N
Longitude	6.17683°W	6.17683°W
Height	60.082m Ell.	60.082m Ell.
Easting	721,404.917m E (SD: ±0.01m)	
Northing	733,999.129m N (SD: ±0.01m)	
Height	3.793m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	333.09°T 331.63°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	6
Easting	721,403.317m E
Northing	733,999.567m N
Range	1.66m Geodetic
Bearing TO	286.79°True
Bearing FROM	106.79°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

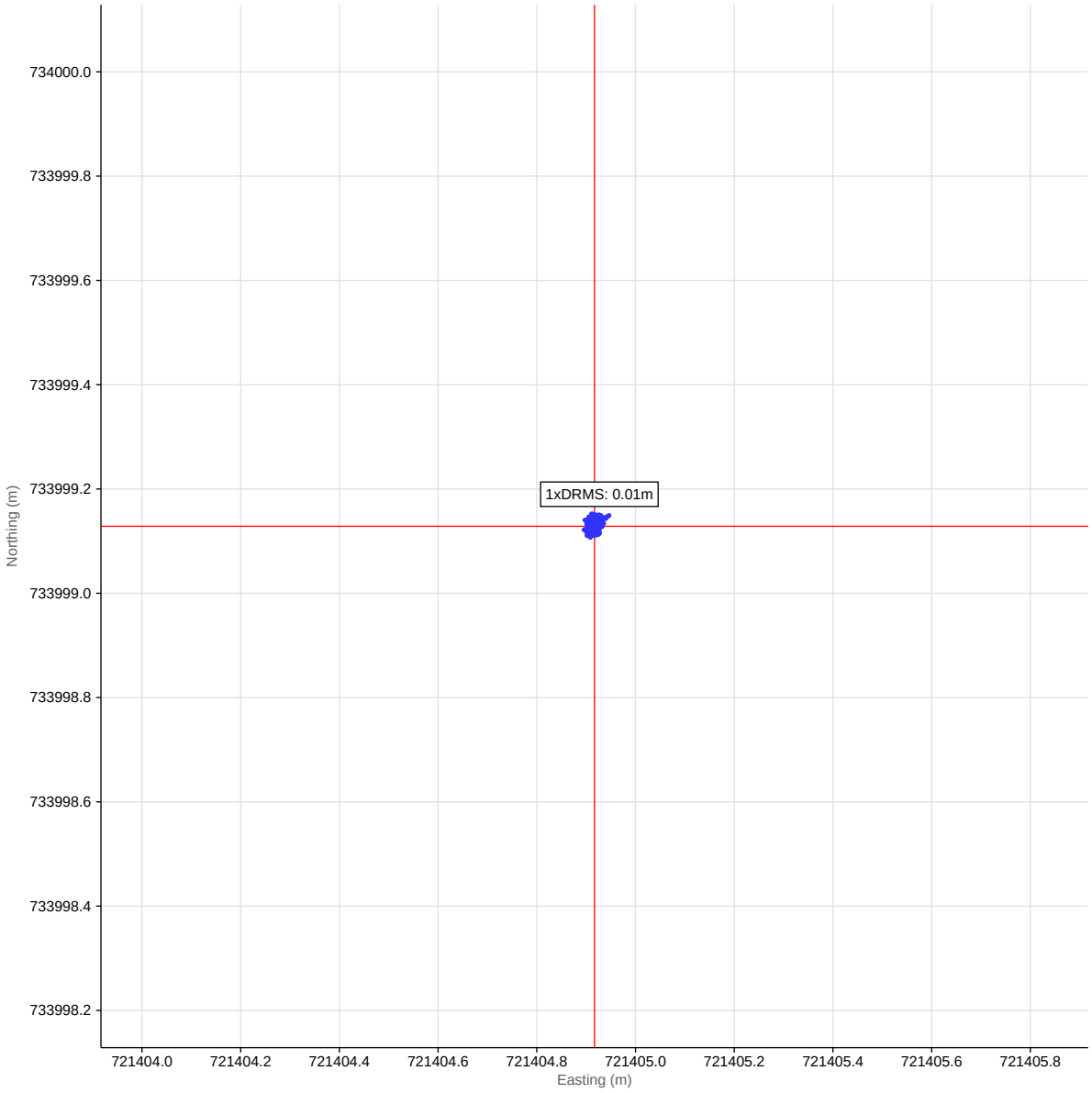
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

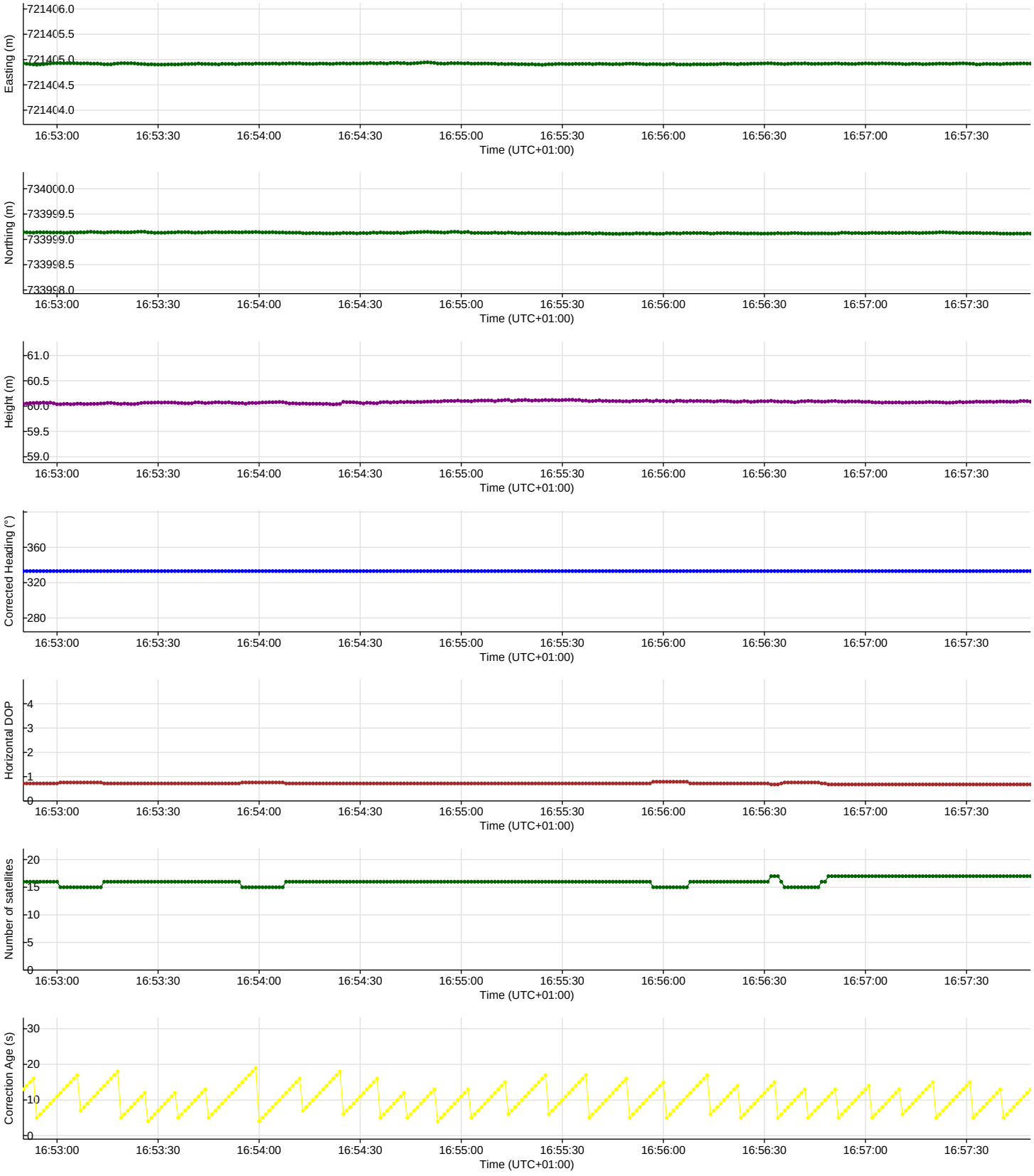
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,404.917m E	733,999.129m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM= 6.9 DTW= 0.7 D-ODM= 2.4m D-CD= 5.0m		

Session Name: Goose Map 20180813-134358 Records Used: 303 of 303

Start Time: 13 Aug 2018, 14:43:58+01:00 End Time: 13 Aug 2018, 14:49:00+01:00 Session Length: 00:05:02

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34210°N	53.34210°N
Longitude	6.17725°W	6.17725°W
Height	58.221m Ell.	58.221m Ell.
Easting	721,376.864m E (SD: ±0.02m)	
Northing	733,978.968m N (SD: ±0.03m)	
Height	1.931m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	273.80°T 272.34°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	7
Easting	721,377.195m E
Northing	733,978.861m N
Range	0.35m Geodetic
Bearing TO	109.44°True
Bearing FROM	289.44°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=6.4M DTW=0.8M CD=3.0M ODM=0.5M		

Session Name: Goose Map 20180818-133644 Records Used: 300 of 300

Start Time: 18 Aug 2018, 14:36:44+01:00 End Time: 18 Aug 2018, 14:41:44+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34507°N	53.34507°N
Longitude	6.17780°W	6.17780°W
Height	56.516m Ell.	56.515m Ell.
Easting	721,332.257m E (SD: ±0.01m)	
Northing	734,308.311m N (SD: ±0.01m)	
Height	0.221m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	192.59°T 191.13°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	8
Easting	721,334.137m E
Northing	734,308.409m N
Range	1.88m Geodetic
Bearing TO	88.48°True
Bearing FROM	268.48°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=10.5M DTW=0.8M CD=2.8M ODM=0.3M		

Session Name: Goose Map 20180818-125110 Records Used: 300 of 300

Start Time: 18 Aug 2018, 13:51:10+01:00 End Time: 18 Aug 2018, 13:56:10+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34464°N	53.34464°N
Longitude	6.17830°W	6.17830°W
Height	56.299m Ell.	56.299m Ell.
Easting	721,299.816m E (SD: ±0.01m)	
Northing	734,259.550m N (SD: ±0.01m)	
Height	0.004m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	165.38°T 163.92°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	9
Easting	721,300.043m E
Northing	734,260.781m N
Range	1.25m Geodetic
Bearing TO	11.92°True
Bearing FROM	191.92°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=5.20M DWL=4.3M D-ODM=2.7m D-CD=5.2m		

Session Name: Goose Map 20180814-052638 Records Used: 300 of 300

Start Time: 14 Aug 2018, 06:26:38+01:00 End Time: 14 Aug 2018, 06:31:38+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34160°N	53.34160°N
Longitude	6.17831°W	6.17831°W
Height	58.672m Ell.	58.672m Ell.
Easting	721,307.949m E (SD: ±0.01m)	
Northing	733,921.702m N (SD: ±0.01m)	
Height	2.381m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	46.39°T 44.93°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	10
Easting	721,306.038m E
Northing	733,921.380m N
Range	1.94m Geodetic
Bearing TO	261.92°True
Bearing FROM	81.92°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

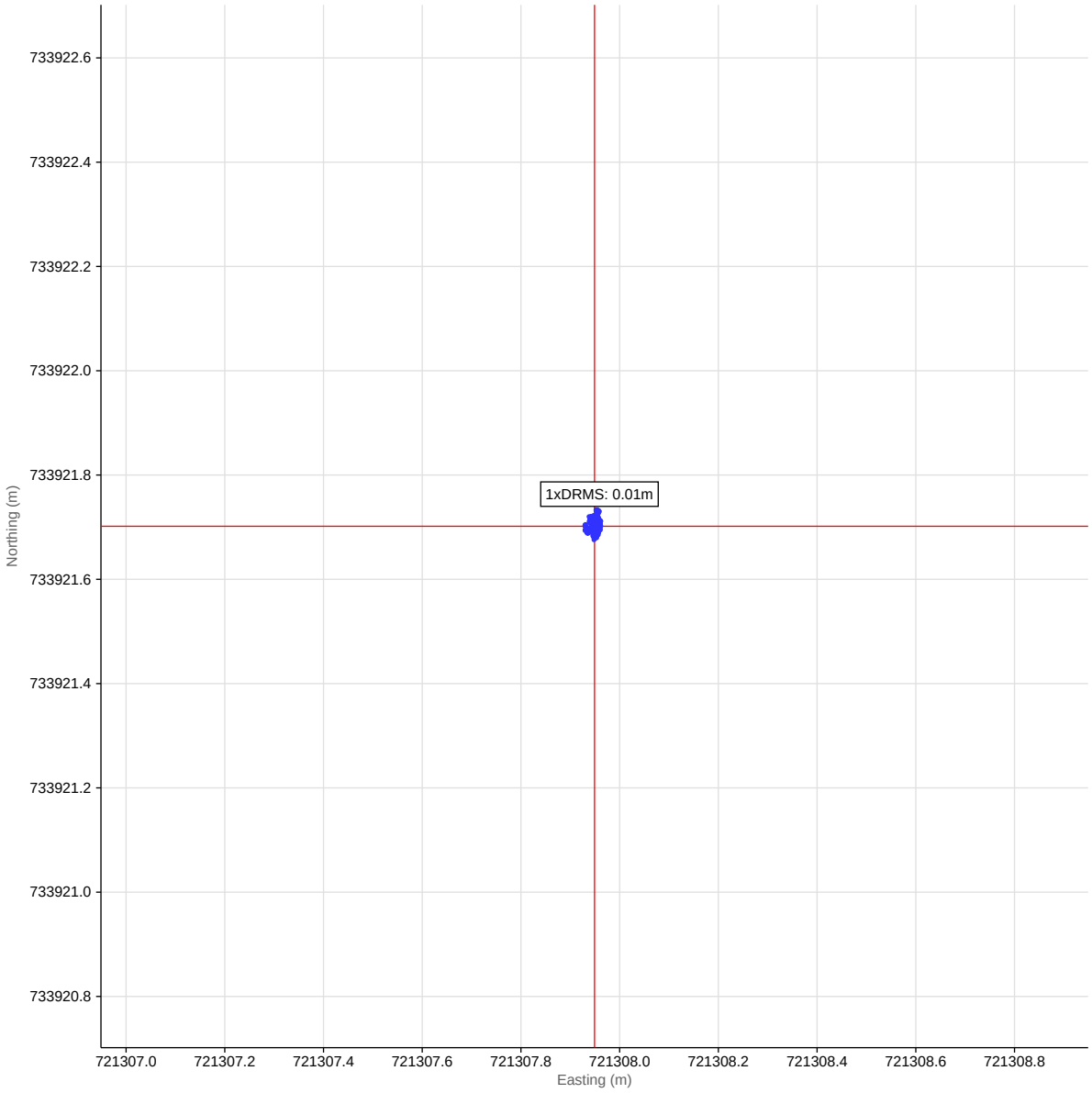
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

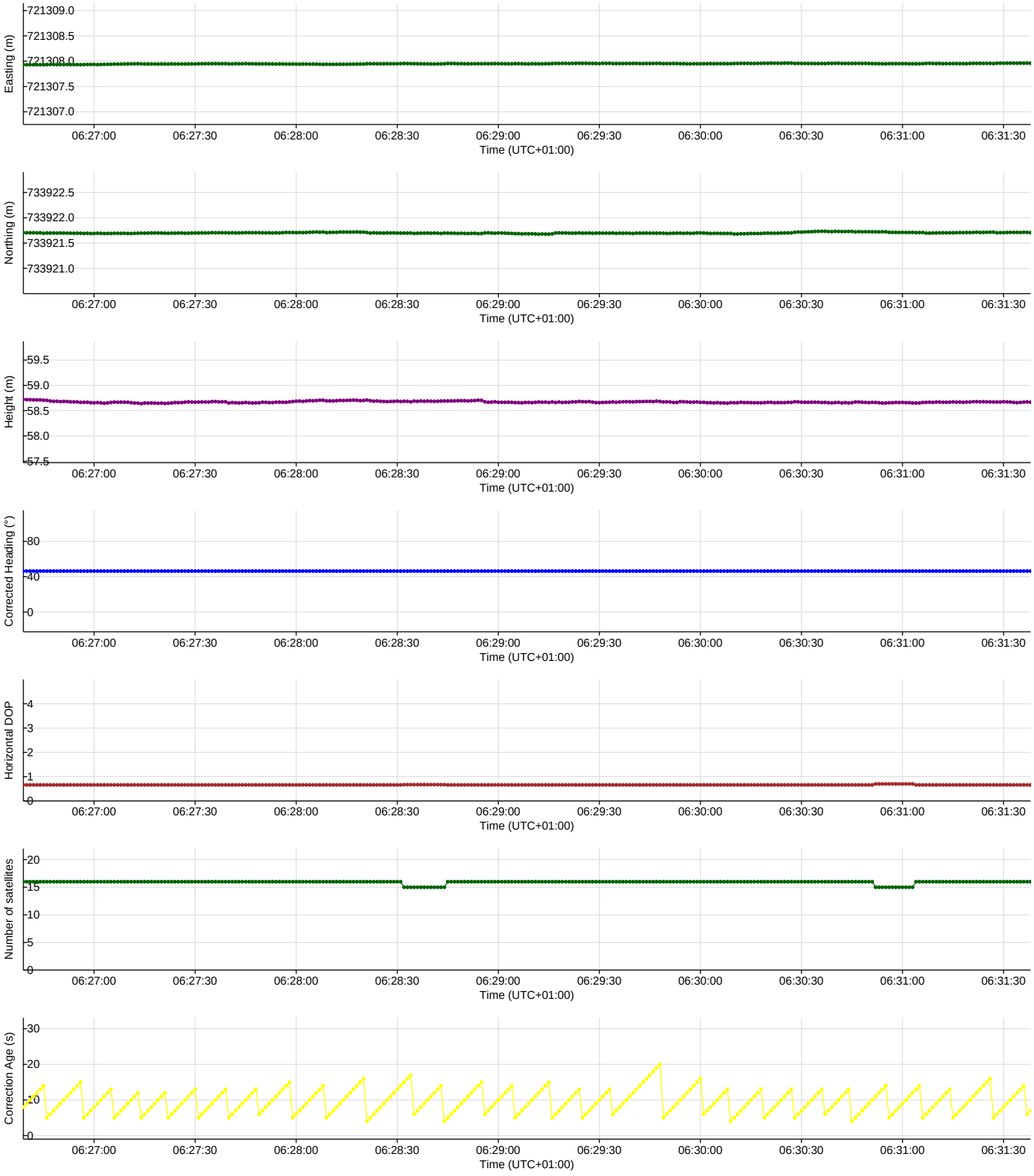
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,307.949m E	733,921.702m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=9.5M DTW=2.8M CD=6.3M ODM=3.8M		

Session Name: Goose Map 20180818-171637 Records Used: 300 of 300

Start Time: 18 Aug 2018, 18:16:38+01:00 End Time: 18 Aug 2018, 18:21:38+01:00 Session Length: 00:05:00

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34491°N	53.34491°N
Longitude	6.17867°W	6.17867°W
Height	59.848m Ell.	59.848m Ell.
Easting	721,274.775m E (SD: ±0.01m)	
Northing	734,289.092m N (SD: ±0.01m)	
Height	3.552m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	294.39°T 292.93°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	11
Easting	721,275.110m E
Northing	734,288.000m N
Range	1.14m Geodetic
Bearing TO	164.39°True
Bearing FROM	344.39°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

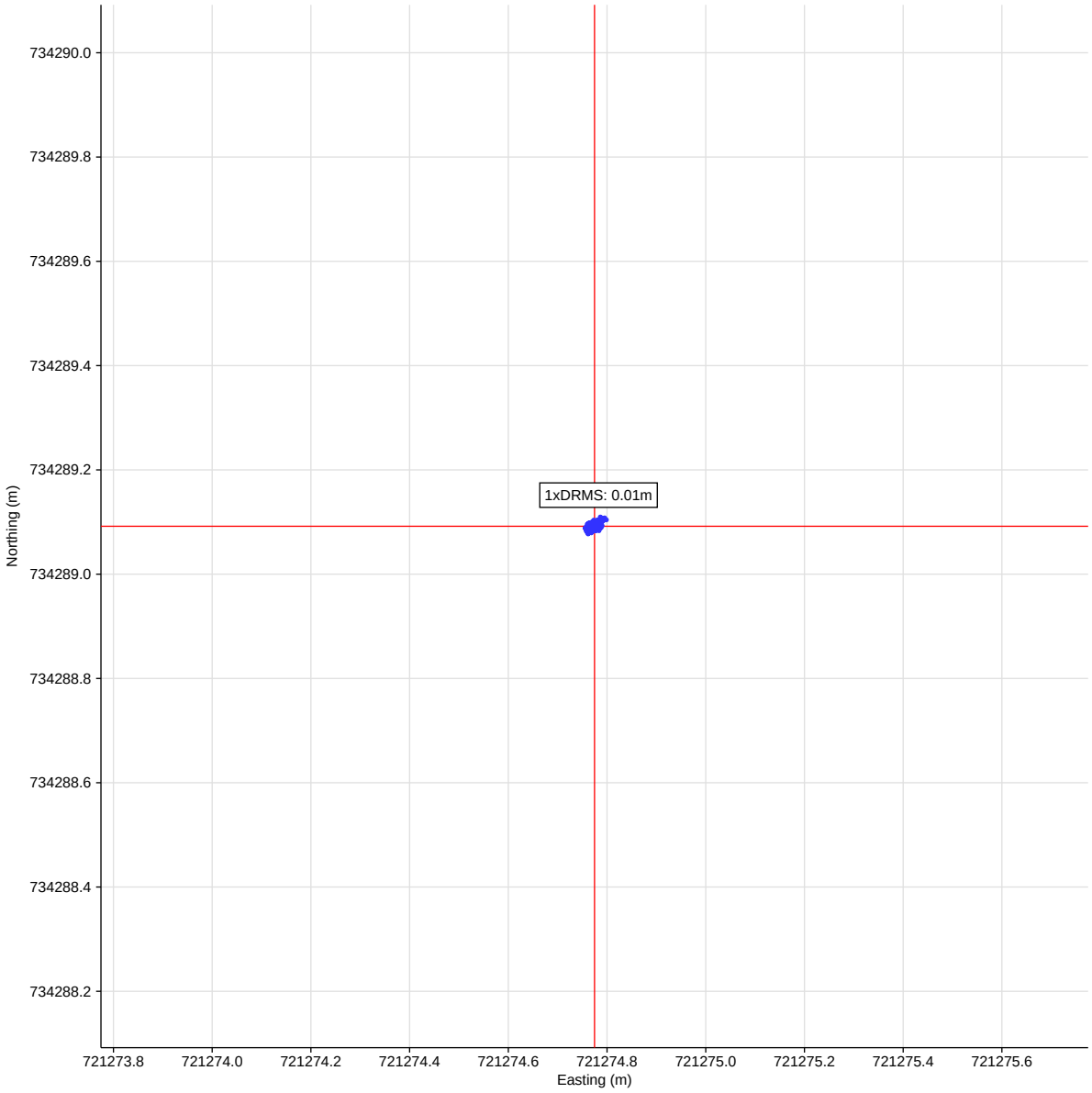
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

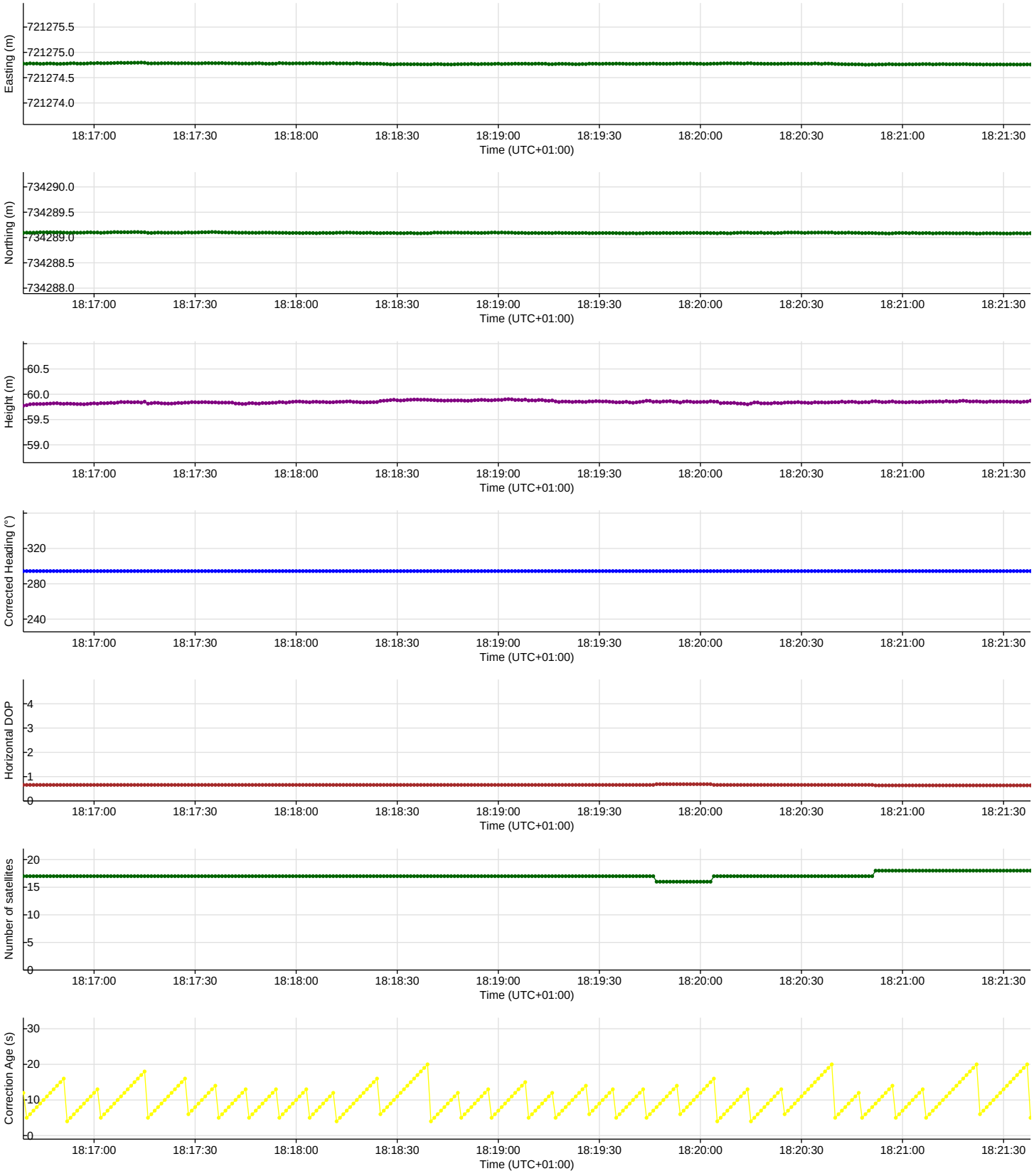
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,274.775m E	734,289.092m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=6.70M DWL=3.80M DECK HEIGHT ABOVE CD=4.60 DHA ODM=2.10M		

Session Name: Goose Map 20180814-193024 Records Used: 300 of 300

Start Time: 14 Aug 2018, 20:30:25+01:00 End Time: 14 Aug 2018, 20:35:49+01:00 Session Length: 00:05:24

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34248°N	53.34248°N
Longitude	6.17945°W	6.17945°W
Height	58.072m Ell.	58.072m Ell.
Easting	721,229.589m E (SD: ±0.01m)	
Northing	734,017.150m N (SD: ±0.01m)	
Height	1.779m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	120.89°T 119.43°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	12
Easting	721,230.327m E
Northing	734,016.305m N
Range	1.12m Geodetic
Bearing TO	140.35°True
Bearing FROM	320.35°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

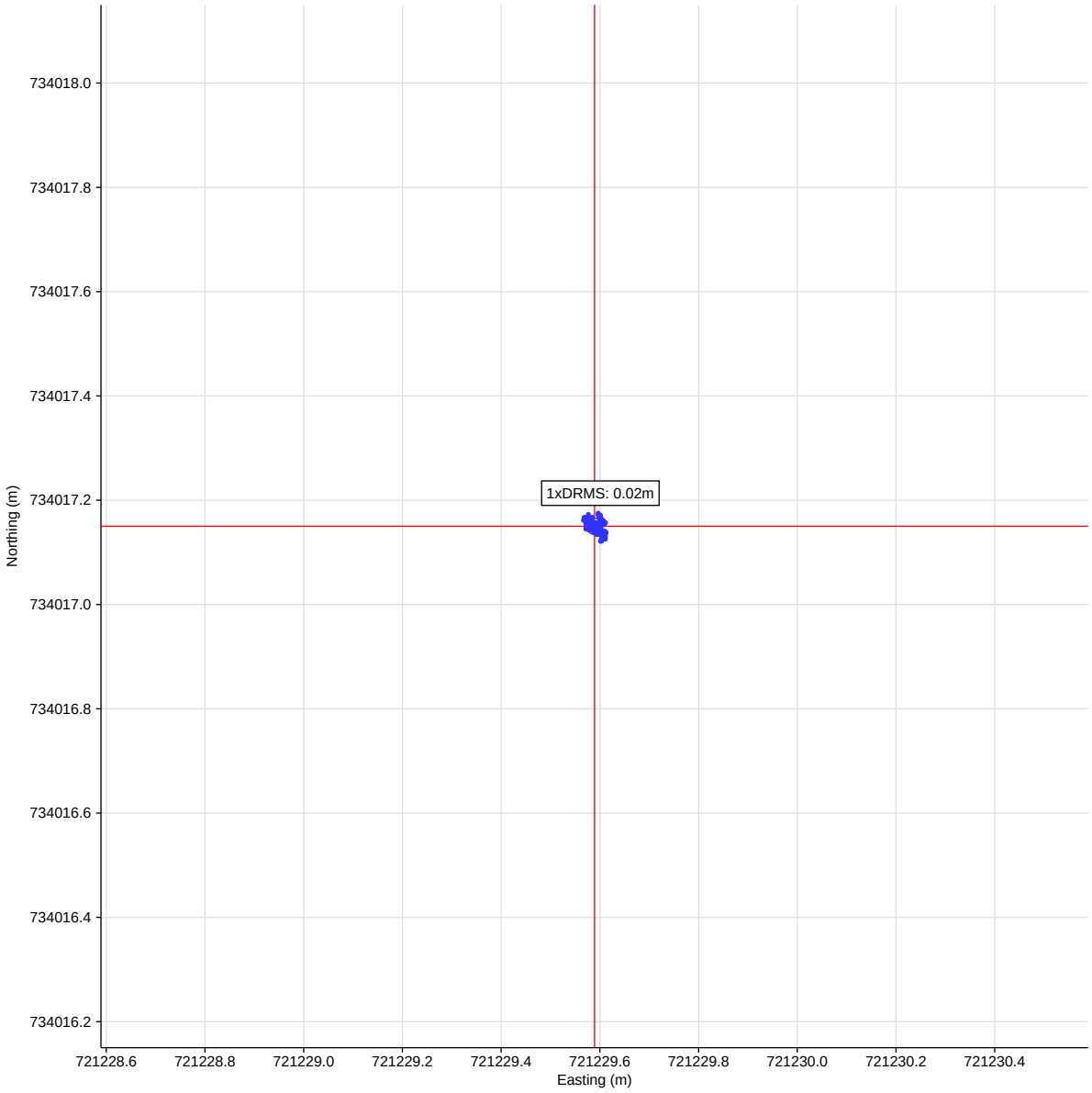
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

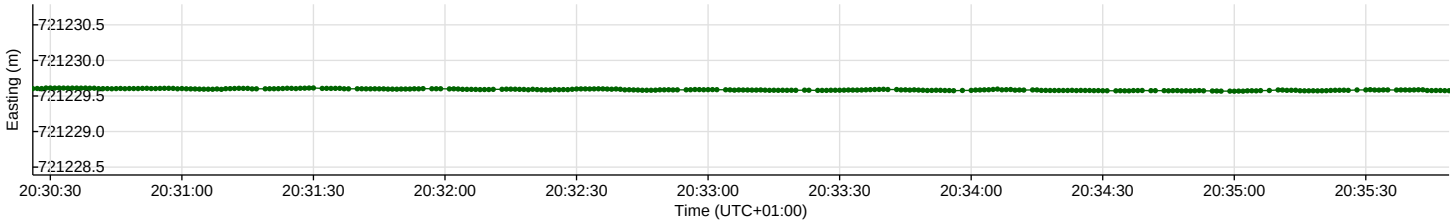
Scatter Plot

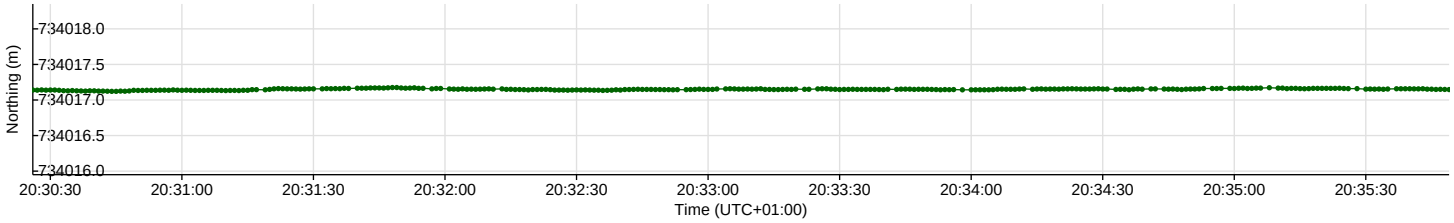


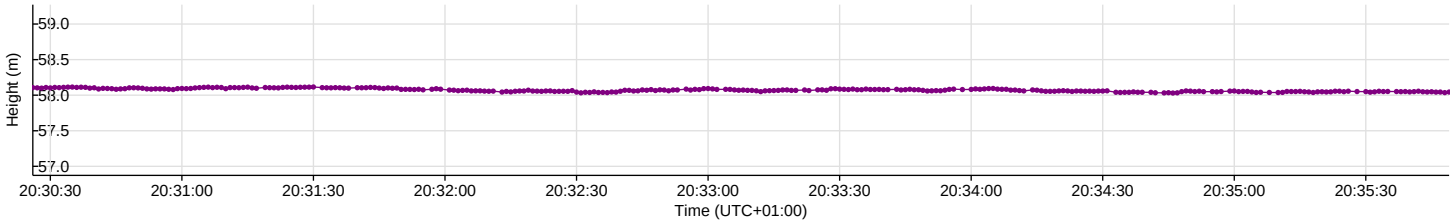
Mean Position

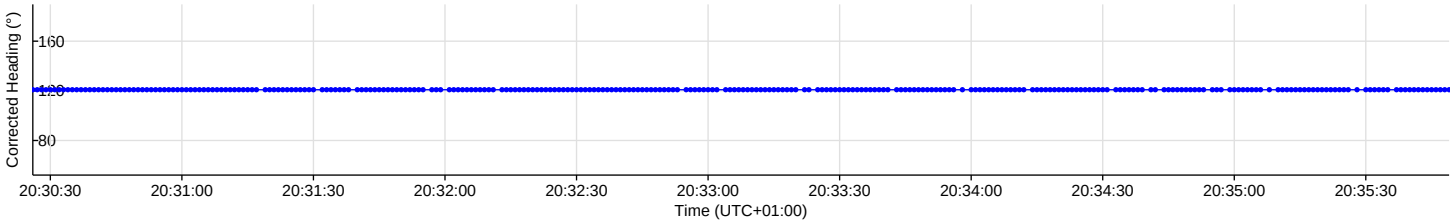
	Easting	Northing
Aran 120A	721,229.589m E	734,017.150m N

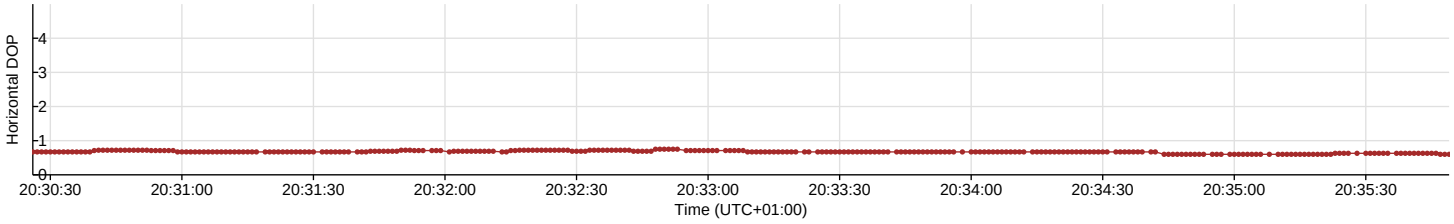
Time Series Plots for Aran 120A

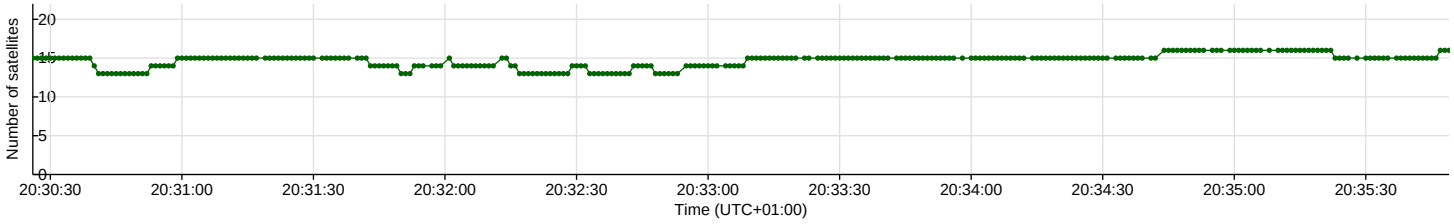


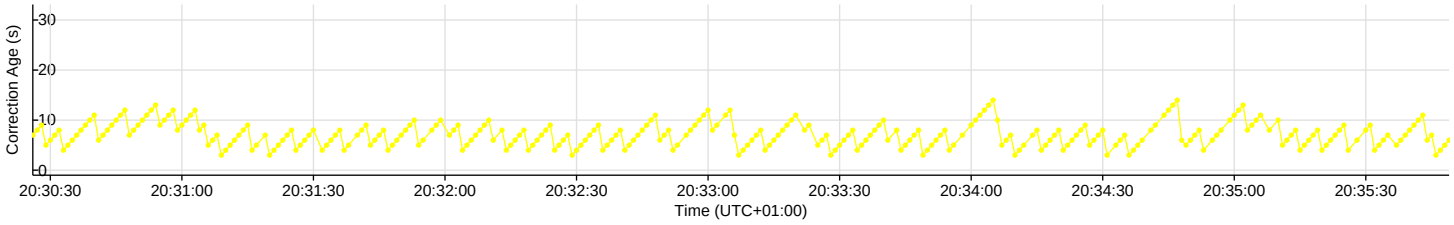












STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM= 3.7m DTW=0.5m CD=4.7m ODM=2.2m		

Session Name: Goose Map 20180814-130218 Records Used: 300 of 300

Start Time: 14 Aug 2018, 14:02:18+01:00 End Time: 14 Aug 2018, 14:07:18+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34139°N	53.34139°N
Longitude	6.17995°W	6.17995°W
Height	58.250m Ell.	58.250m Ell.
Easting	721,199.170m E (SD: ±0.02m)	
Northing	733,895.765m N (SD: ±0.02m)	
Height	1.957m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	296.31°T 294.85°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	13
Easting	721,200.126m E
Northing	733,894.187m N
Range	1.84m Geodetic
Bearing TO	150.24°True
Bearing FROM	330.24°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	D-ML =4.7 D-WL=0.70mD-ODM=2.3m D-CD=4.8m		

Session Name: Goose Map 20180812-103648 Records Used: 300 of 300

Start Time: 12 Aug 2018, 11:36:49+01:00 End Time: 12 Aug 2018, 11:41:48+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34193°N	53.34193°N
Longitude	6.17998°W	6.17998°W
Height	58.280m Ell.	58.280m Ell.
Easting	721,195.585m E(SD: ±0.03m)	
Northing	733,955.087m N(SD: ±0.02m)	
Height	1.986m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	278.39°T 276.93°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	14
Easting	721,195.846m E
Northing	733,957.535m N
Range	2.46m Geodetic
Bearing TO	7.55°True
Bearing FROM	187.55°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=4.2M DWL=0.80M DECK HEIGHT CD 4.8M dECK HEIGHT ABOVE ODM=2.30M		

Session Name: Goose Map 20180814-140858 Records Used: 300 of 300

Start Time: 14 Aug 2018, 15:08:58+01:00 End Time: 14 Aug 2018, 15:13:58+01:00 Session Length: 00:05:00

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34186°N	53.34186°N
Longitude	6.18095°W	6.18095°W
Height	58.289m Ell.	58.289m Ell.
Easting	721,131.337m E (SD: ±0.02m)	
Northing	733,945.317m N (SD: ±0.02m)	
Height	1.995m Ort. (SD: ±0.04m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	348.19°T 346.73°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	15
Easting	721,132.209m E
Northing	733,944.781m N
Range	1.02m Geodetic
Bearing TO	123.03°True
Bearing FROM	303.03°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

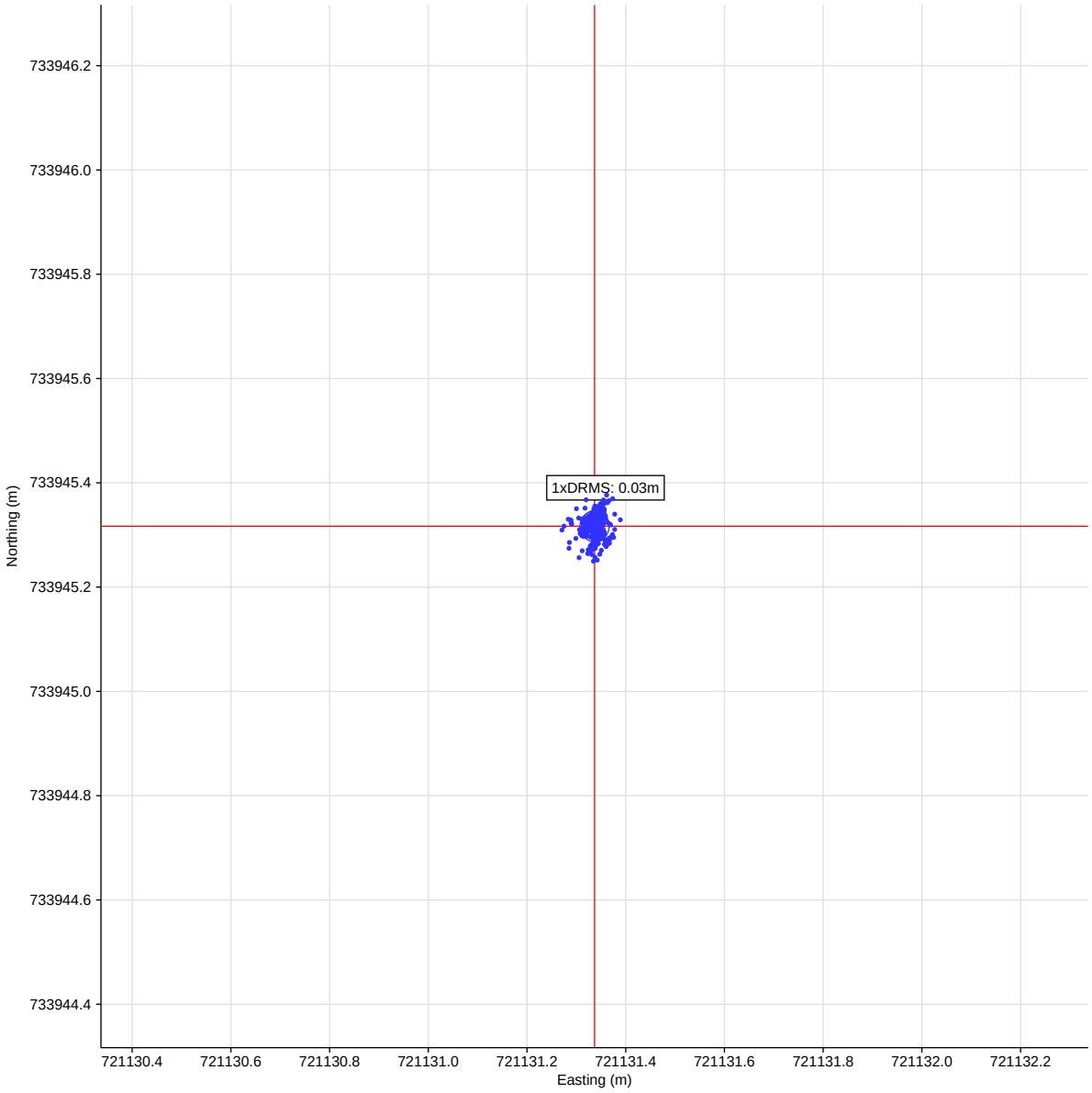
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

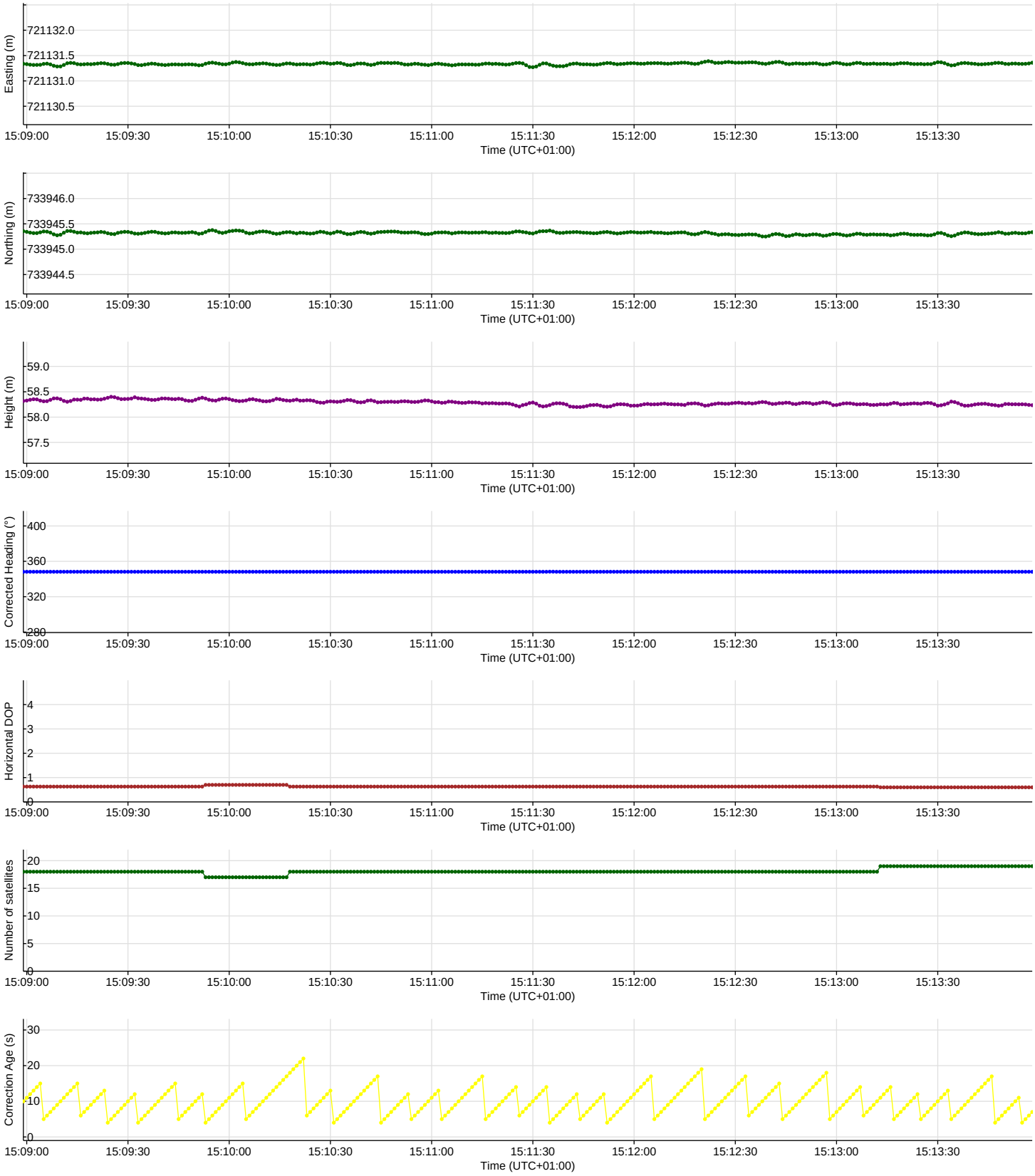
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,131.337m E	733,945.317m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 DublinMPR		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=9.9M DWL=5.9M D-ODM=4.7m D-CD=7.2m		

Session Name: Goose Map 20180813-080549 Records Used: 300 of 300

Start Time: 13 Aug 2018, 09:05:49+01:00 End Time: 13 Aug 2018, 09:10:49+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34254°N	53.34254°N
Longitude	6.18224°W	6.18224°W
Height	60.722m Ell.	60.722m Ell.
Easting	721,043.400m E (SD: ±0.01m)	
Northing	734,019.051m N (SD: ±0.01m)	
Height	4.425m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	349.49°T 348.03°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	BL-BH59
Easting	721,043.090m E
Northing	734,017.100m N
Range	1.98m Geodetic
Bearing TO	190.48°True
Bearing FROM	10.48°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

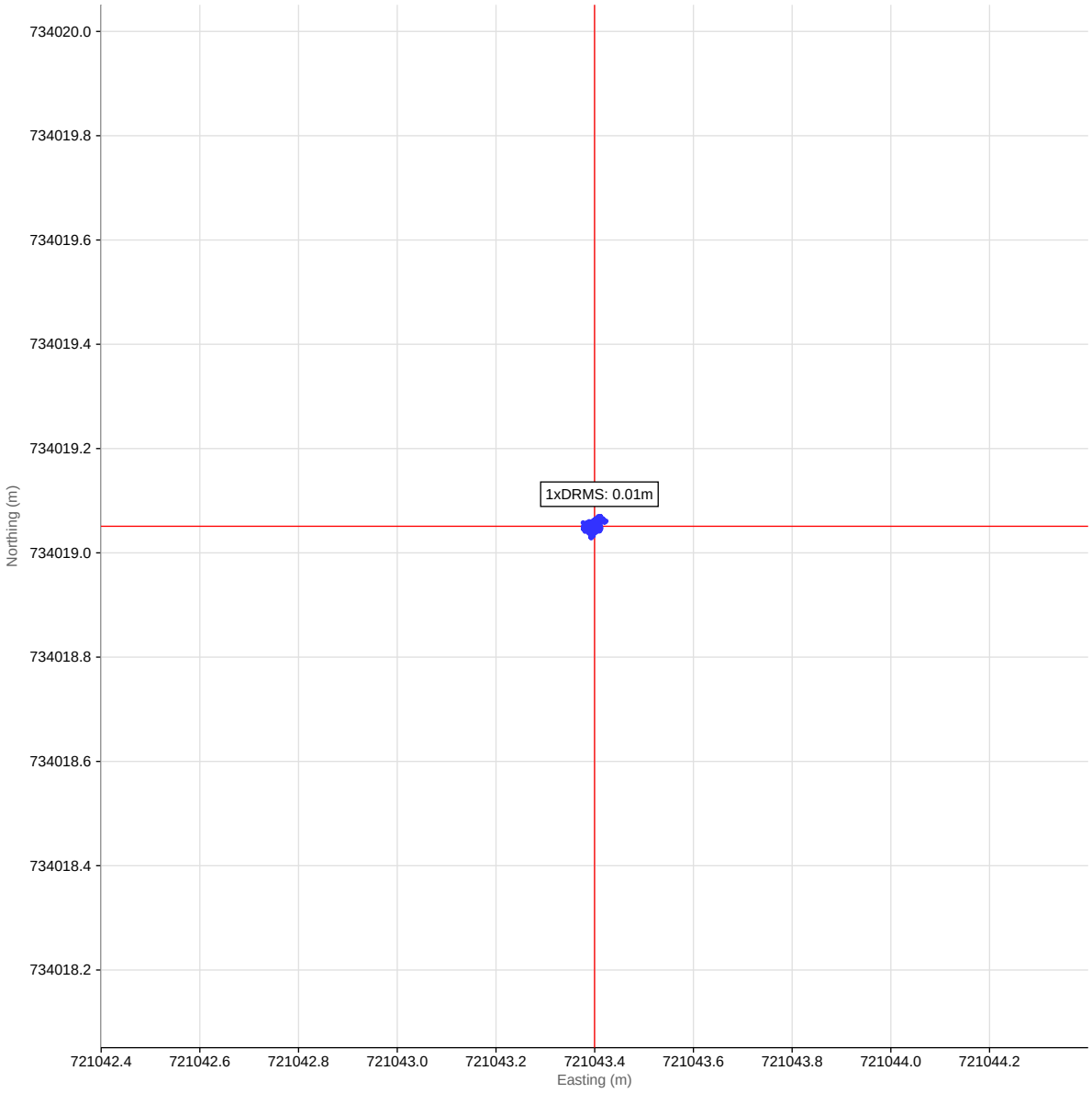
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

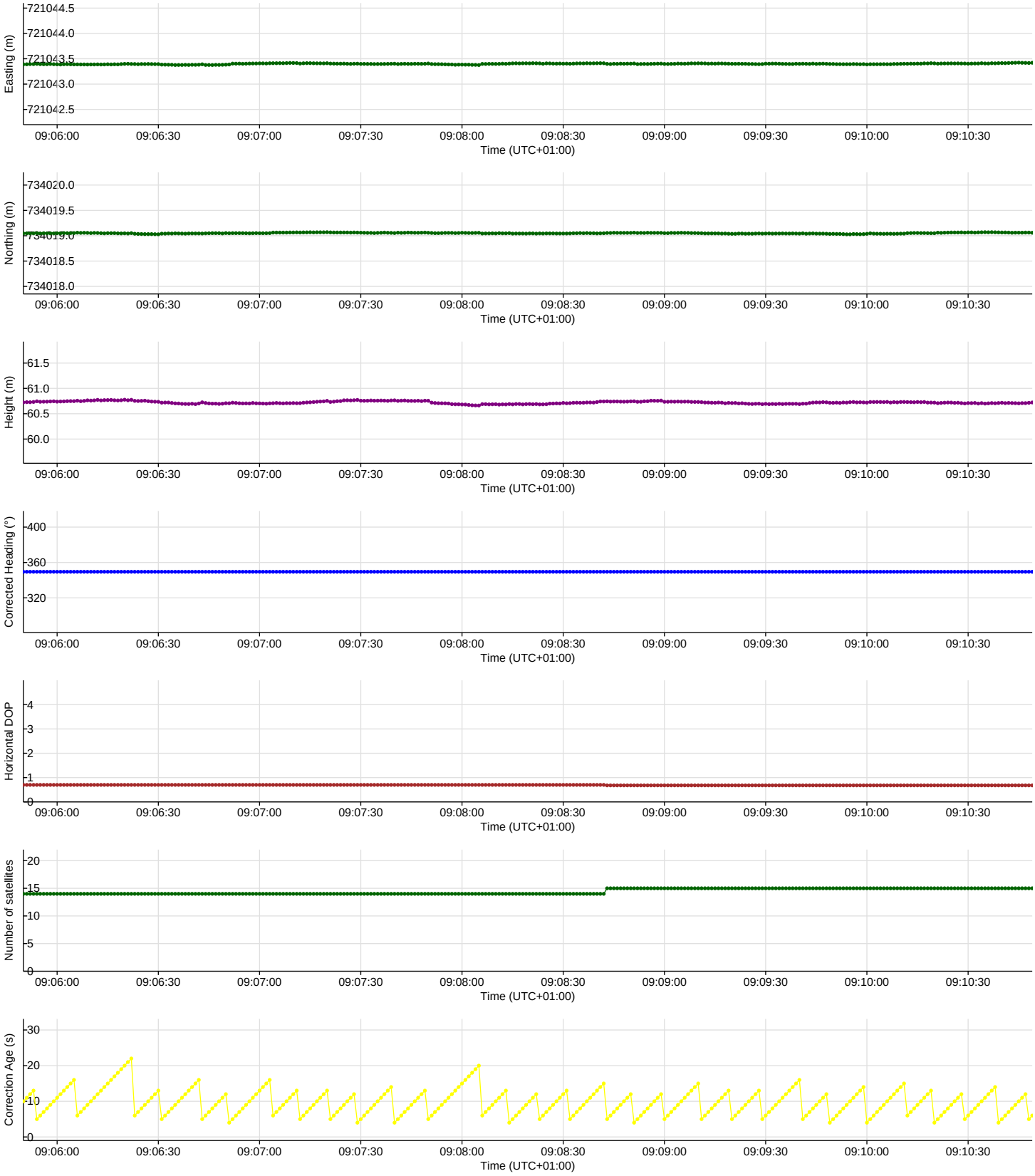
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	721,043.400m E	734,019.051m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=8.7M DTW=0.8M CD=2.3M ODM=0.2M		

Session Name: Goose Map 20180818-120423 Records Used: 300 of 300

Start Time: 18 Aug 2018, 13:04:23+01:00 End Time: 18 Aug 2018, 13:09:22+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34468°N	53.34468°N
Longitude	6.18246°W	6.18246°W
Height	55.846m Ell.	55.846m Ell.
Easting	721,022.979m E (SD: ±0.01m)	
Northing	734,257.573m N (SD: ±0.02m)	
Height	-0.454m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	252.59°T 251.13°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	18
Easting	721,023.624m E
Northing	734,258.189m N
Range	0.89m Geodetic
Bearing TO	47.77°True
Bearing FROM	227.77°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DW= 08 D/ML=5.00 D-ODM=2.6m D-CD=5.1m		

Session Name: Goose Map 20180812-113350 Records Used: 300 of 300

Start Time: 12 Aug 2018, 12:33:51+01:00 End Time: 12 Aug 2018, 12:38:50+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34201°N	53.34201°N
Longitude	6.18279°W	6.18279°W
Height	58.576m Ell.	58.576m Ell.
Easting	721,008.344m E(SD: ±0.02m)	
Northing	733,959.136m N(SD: ±0.03m)	
Height	2.279m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	245.92°T 244.46°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	19
Easting	721,009.907m E
Northing	733,959.479m N
Range	1.60m Geodetic
Bearing TO	79.11°True
Bearing FROM	259.11°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=4.5M DTW=0.7M CD=2.8M ODM=0.2M		

Session Name: Goose Map 20180820-144300 Records Used: 300 of 300

Start Time: 20 Aug 2018, 15:43:00+01:00 End Time: 20 Aug 2018, 15:48:00+01:00 Session Length: 00:05:00

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34497°N	53.34497°N
Longitude	6.18326°W	6.18326°W
Height	56.254m Ell.	56.254m Ell.
Easting	720,968.669m E (SD: ±0.01m)	
Northing	734,288.086m N (SD: ±0.01m)	
Height	-0.047m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	341.58°T 340.12°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	21
Easting	720,970.233m E
Northing	734,288.002m N
Range	1.57m Geodetic
Bearing TO	94.54°True
Bearing FROM	274.54°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

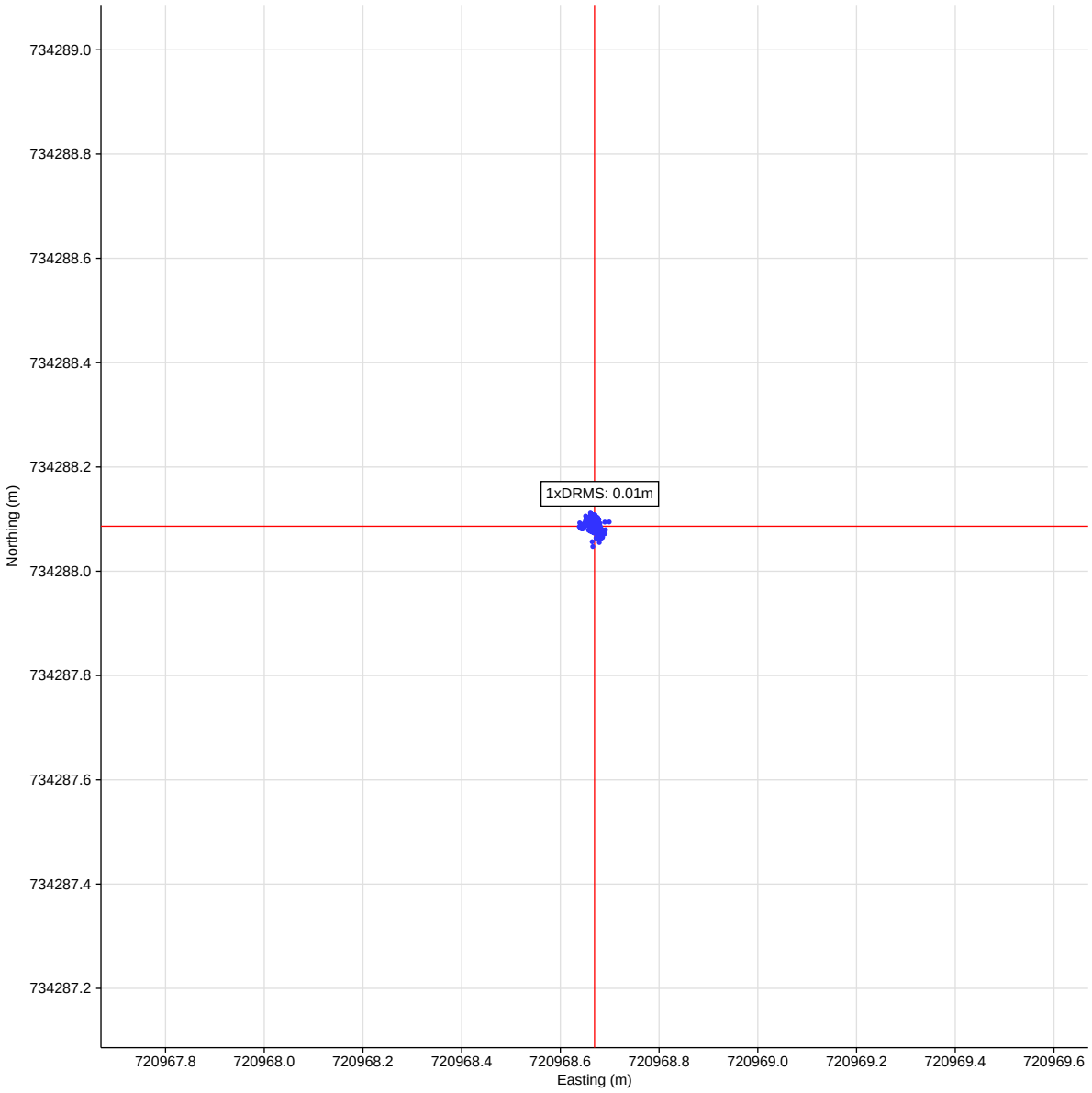
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

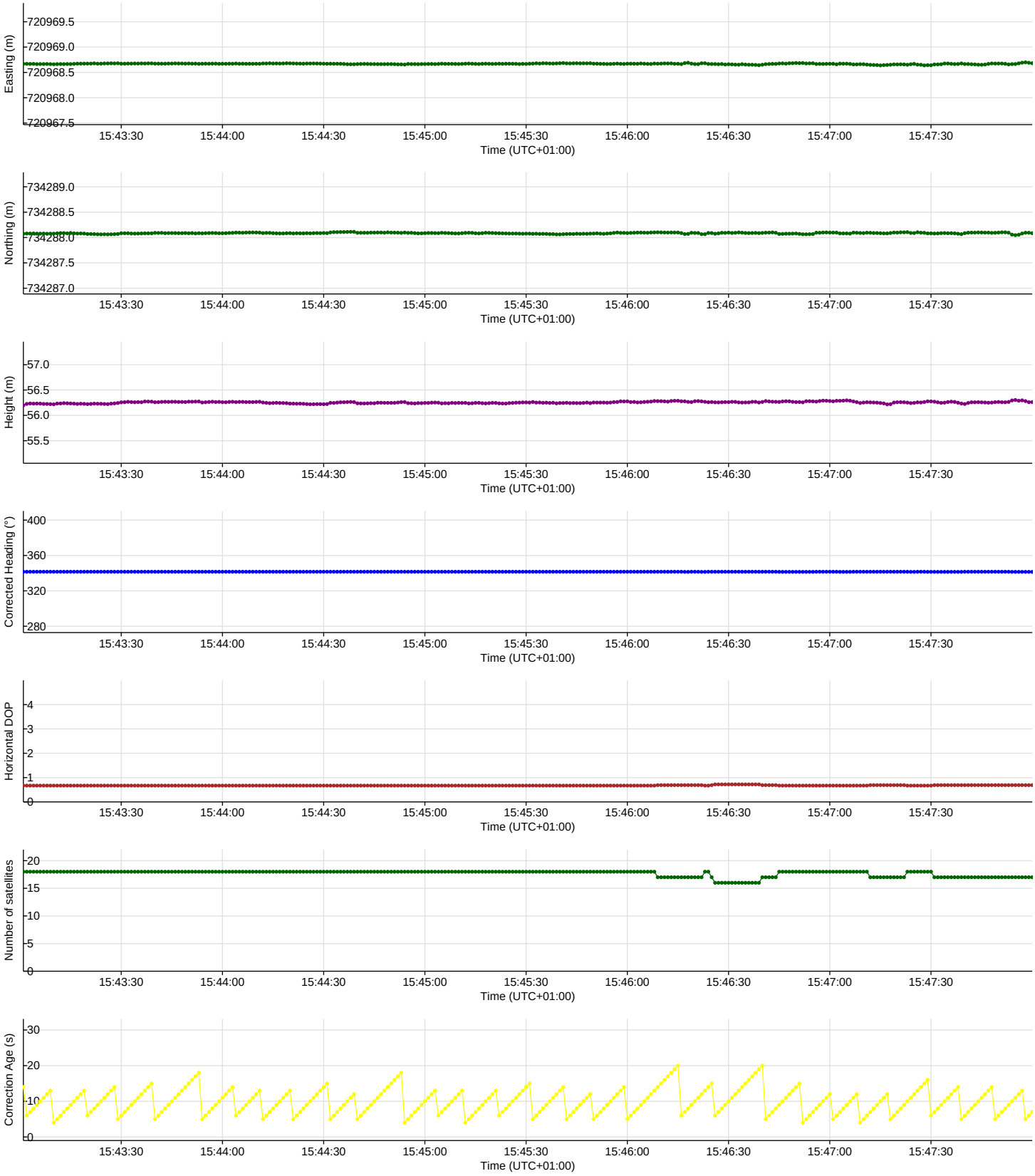
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	720,968.669m E	734,288.086m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=12.0m DTW= 0.8m CD=4.0m ODM=1.5m		

Session Name: Goose Map 20180814-154903 Records Used: 300 of 300

Start Time: 14 Aug 2018, 16:49:03+01:00 End Time: 14 Aug 2018, 16:54:03+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34258°N	53.34258°N
Longitude	6.18364°W	6.18364°W
Height	57.350m Ell.	57.350m Ell.
Easting	720,950.452m E (SD: ±0.02m)	
Northing	734,021.294m N (SD: ±0.02m)	
Height	1.051m Ort. (SD: ±0.04m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	267.59°T 266.13°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	25
Easting	720,950.422m E
Northing	734,019.196m N
Range	2.10m Geodetic
Bearing TO	182.27°True
Bearing FROM	2.27°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=5.8M DTW=0.8M CD=2.0M ODM=0.5M		

Session Name: Goose Map 20180818-113918 Records Used: 300 of 300

Start Time: 18 Aug 2018, 12:39:18+01:00 End Time: 18 Aug 2018, 12:44:18+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34472°N	53.34472°N
Longitude	6.18437°W	6.18437°W
Height	55.544m Ell.	55.544m Ell.
Easting	720,895.674m E (SD: ±0.01m)	
Northing	734,258.806m N (SD: ±0.01m)	
Height	-0.758m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	269.89°T 268.43°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	27
Easting	720,895.649m E
Northing	734,260.499m N
Range	1.69m Geodetic
Bearing TO	0.59°True
Bearing FROM	180.59°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=8.7 DTW=3.2 D=6.2 ODM=3.7		

Session Name: Goose Map 20180820-131544 Records Used: 300 of 300

Start Time: 20 Aug 2018, 14:15:44+01:00 End Time: 20 Aug 2018, 14:20:43+01:00 Session Length: 00:04:59

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34478°N	53.34478°N
Longitude	6.18554°W	6.18554°W
Height	59.710m Ell.	59.709m Ell.
Easting	720,817.419m E (SD: ±0.01m)	
Northing	734,262.954m N (SD: ±0.01m)	
Height	3.406m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	12.69°T 11.23°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	29
Easting	720,818.303m E
Northing	734,262.986m N
Range	0.88m Geodetic
Bearing TO	89.36°True
Bearing FROM	269.36°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

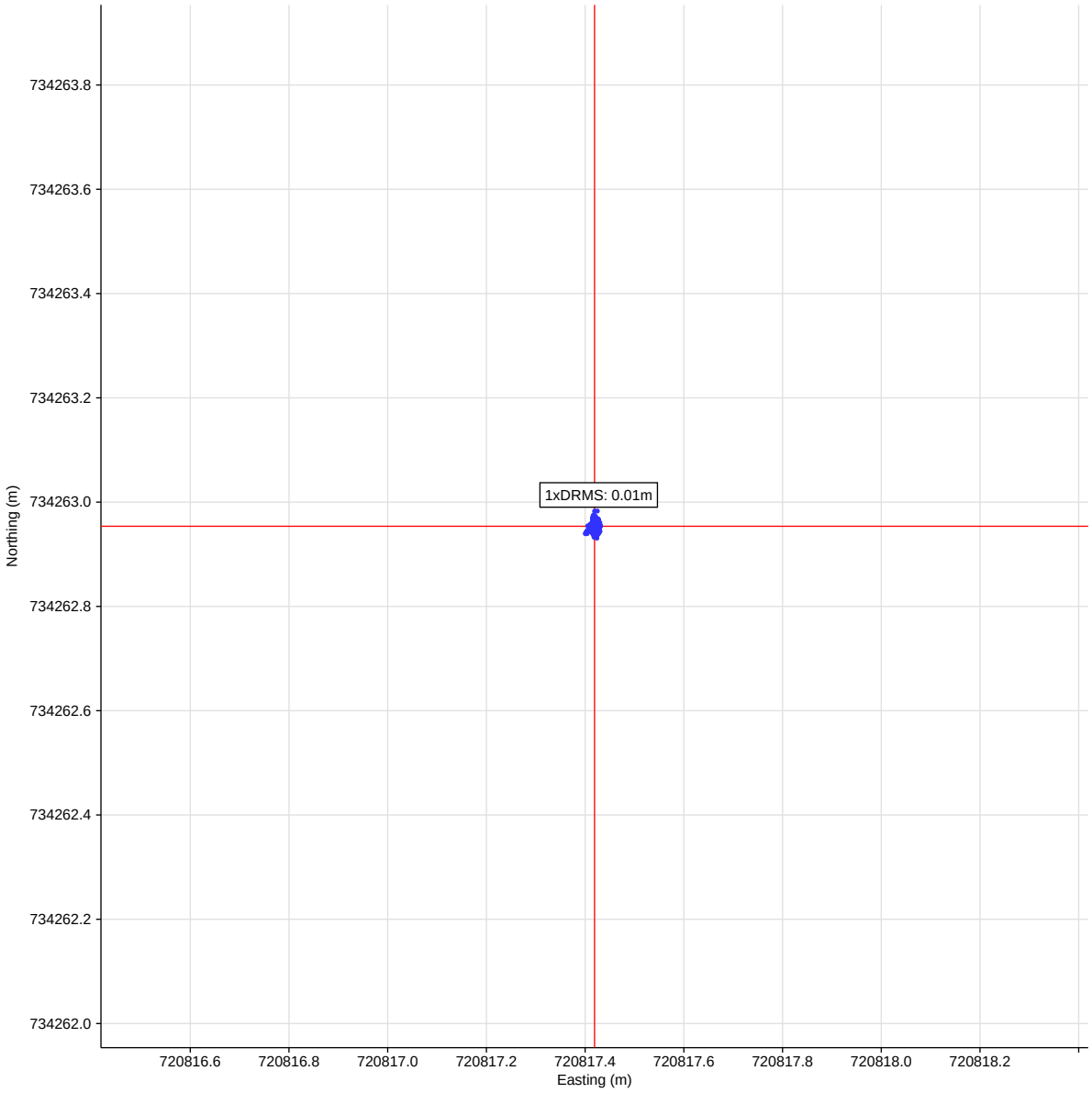
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

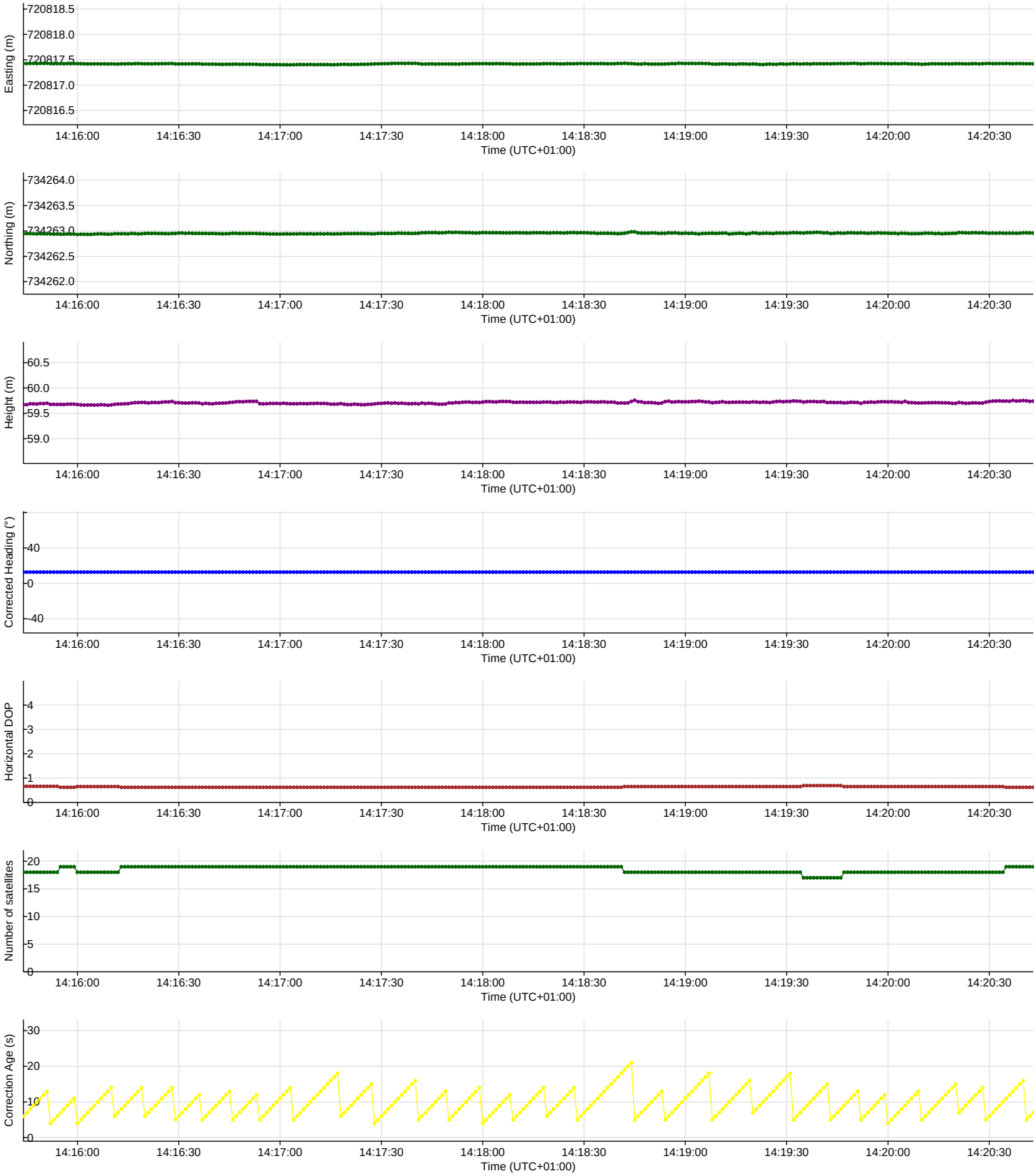
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	720,817.419m E	734,262.954m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=3.8M DTW=0.7M CD=3.1M ODM=0.6M		

Session Name: Goose Map 20180820-155016 Records Used: 300 of 300

Start Time: 20 Aug 2018, 16:50:17+01:00 End Time: 20 Aug 2018, 16:55:16+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34519°N	53.34519°N
Longitude	6.18667°W	6.18667°W
Height	56.690m Ell.	56.690m Ell.
Easting	720,741.448m E (SD: ±0.01m)	
Northing	734,306.163m N (SD: ±0.01m)	
Height	0.384m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	188.71°T 187.25°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	30
Easting	720,740.550m E
Northing	734,307.769m N
Range	1.84m Geodetic
Bearing TO	332.23°True
Bearing FROM	152.23°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=12.3M DTW=0.5M CD=2.7M ODM=0.2M		

Session Name: Goose Map 20180817-120137 Records Used: 300 of 300

Start Time: 17 Aug 2018, 13:01:37+01:00 End Time: 17 Aug 2018, 13:06:37+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34505°N	53.34505°N
Longitude	6.20013°W	6.20013°W
Height	56.225m Ell.	56.225m Ell.
Easting	719,845.235m E (SD: ±0.04m)	
Northing	734,268.067m N (SD: ±0.04m)	
Height	-0.098m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	233.60°T 232.16°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	31
Easting	719,844.817m E
Northing	734,268.404m N
Range	0.54m Geodetic
Bearing TO	310.25°True
Bearing FROM	130.25°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=15.3M DTW=0.5M CD=4.2M ODM=1.7M		

Session Name: Goose Map 20180817-145756 Records Used: 300 of 300

Start Time: 17 Aug 2018, 15:57:57+01:00 End Time: 17 Aug 2018, 16:02:56+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34491°N	53.34491°N
Longitude	6.20095°W	6.20095°W
Height	57.716m Ell.	57.716m Ell.
Easting	719,791.516m E (SD: ±0.05m)	
Northing	734,252.021m N (SD: ±0.21m)	
Height	1.392m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	279.48°T 278.03°G	±0.5°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	32
Easting	719,791.946m E
Northing	734,251.485m N
Range	0.69m Geodetic
Bearing TO	142.71°True
Bearing FROM	322.71°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=11.6M DTW=0.5M CD=3.0M ODM=0.5M		

Session Name: Goose Map 20180817-123233 Records Used: 300 of 300

Start Time: 17 Aug 2018, 13:32:34+01:00 End Time: 17 Aug 2018, 13:37:33+01:00 Session Length: 00:04:59

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34463°N	53.34463°N
Longitude	6.20203°W	6.20203°W
Height	56.579m Ell.	56.579m Ell.
Easting	719,720.432m E (SD: ±0.02m)	
Northing	734,219.017m N (SD: ±0.01m)	
Height	0.254m Ort. (SD: ±0.04m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	232.86°T 231.42°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	33
Easting	719,720.796m E
Northing	734,219.635m N
Range	0.72m Geodetic
Bearing TO	32.03°True
Bearing FROM	212.03°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=6.2M DWL=0.8M CD=1.9M ODM=0.6M		

Session Name: Goose Map 20180817-103319 Records Used: 300 of 300

Start Time: 17 Aug 2018, 11:33:20+01:00 End Time: 17 Aug 2018, 11:38:19+01:00 Session Length: 00:04:59

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34505°N	53.34505°N
Longitude	6.20410°W	6.20410°W
Height	55.425m Ell.	55.425m Ell.
Easting	719,581.463m E (SD: ±0.01m)	
Northing	734,261.995m N (SD: ±0.01m)	
Height	-0.903m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	77.71°T 76.27°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	34
Easting	719,585.823m E
Northing	734,261.882m N
Range	4.36m Geodetic
Bearing TO	92.93°True
Bearing FROM	272.93°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

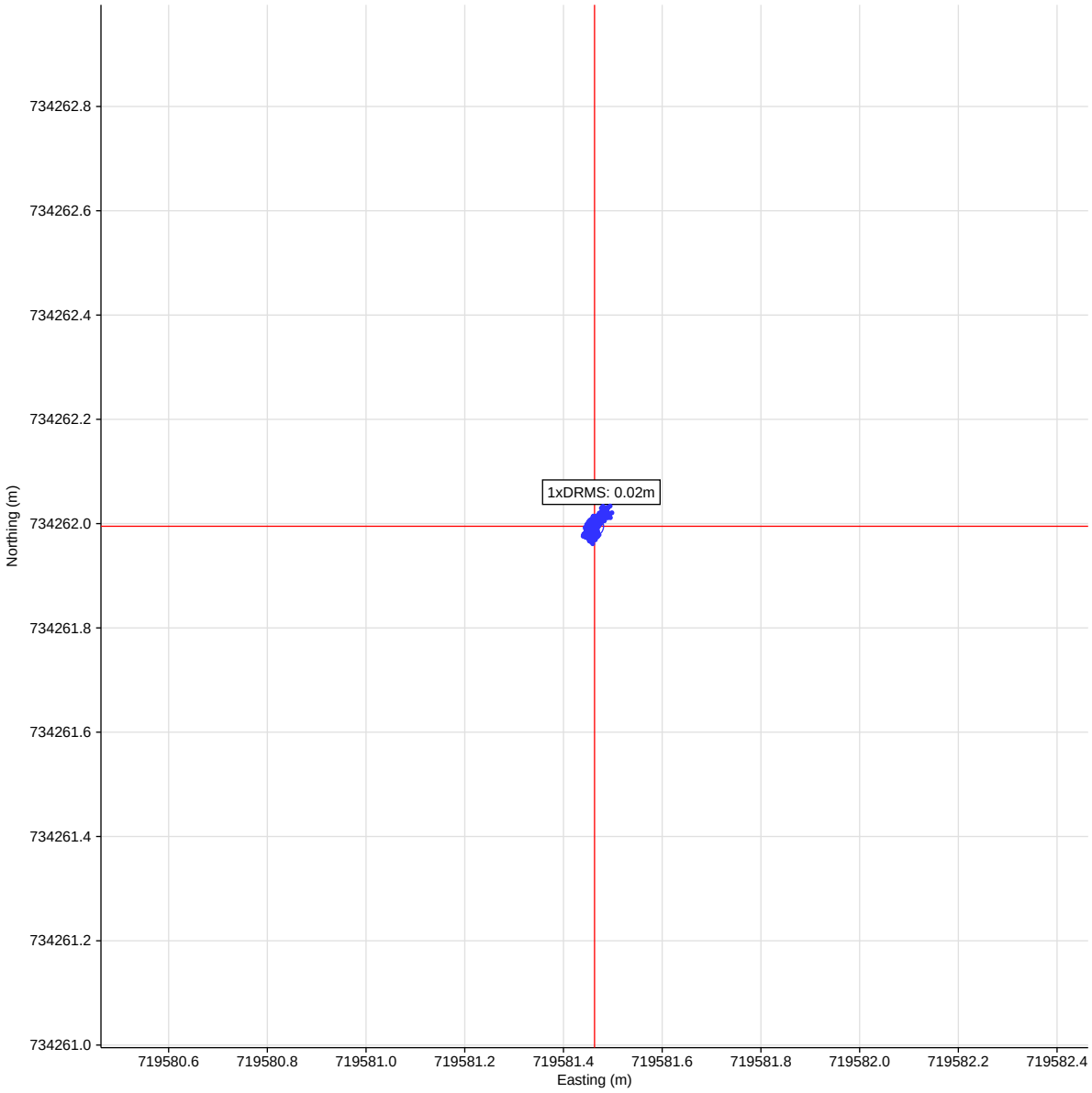
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

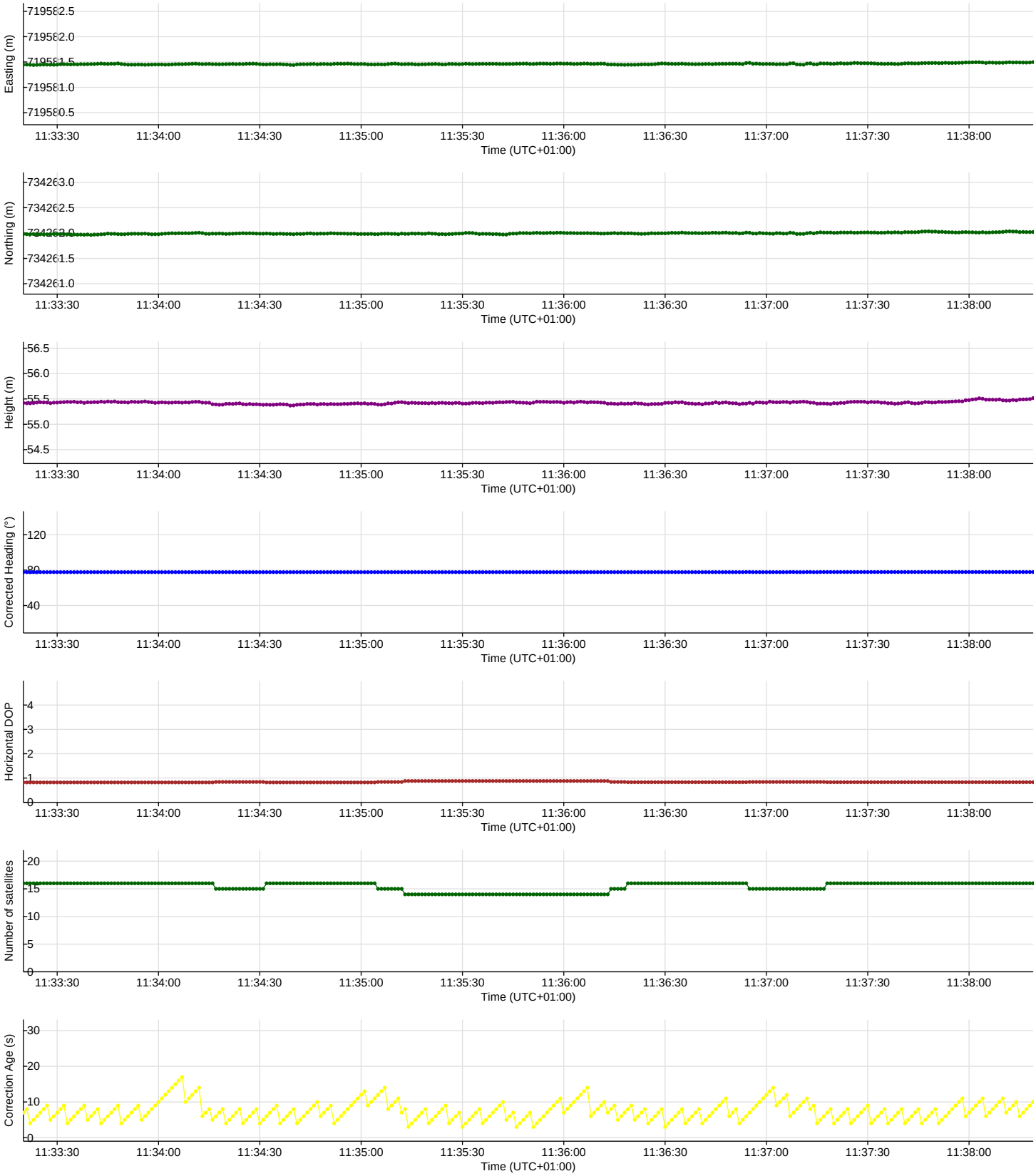
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	719,581.463m E	734,261.995m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DML=7.3M DWL=0.8M CD=4.8M ODM=2.3M		

Session Name: Goose Map 20180815-135047 Records Used: 300 of 300

Start Time: 15 Aug 2018, 14:50:47+01:00 End Time: 15 Aug 2018, 14:55:47+01:00 Session Length: 00:05:00

Mean Position for Aran 120A Moon Pool		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34716°N	53.34716°N
Longitude	6.20498°W	6.20498°W
Height	58.377m Ell.	58.377m Ell.
Easting	719,516.771m E (SD: ±0.01m)	
Northing	734,495.256m N (SD: ±0.02m)	
Height	2.046m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	59.63°T 58.19°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	35
Easting	719,515.339m E
Northing	734,495.010m N
Range	1.45m Geodetic
Bearing TO	261.70°True
Bearing FROM	81.70°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

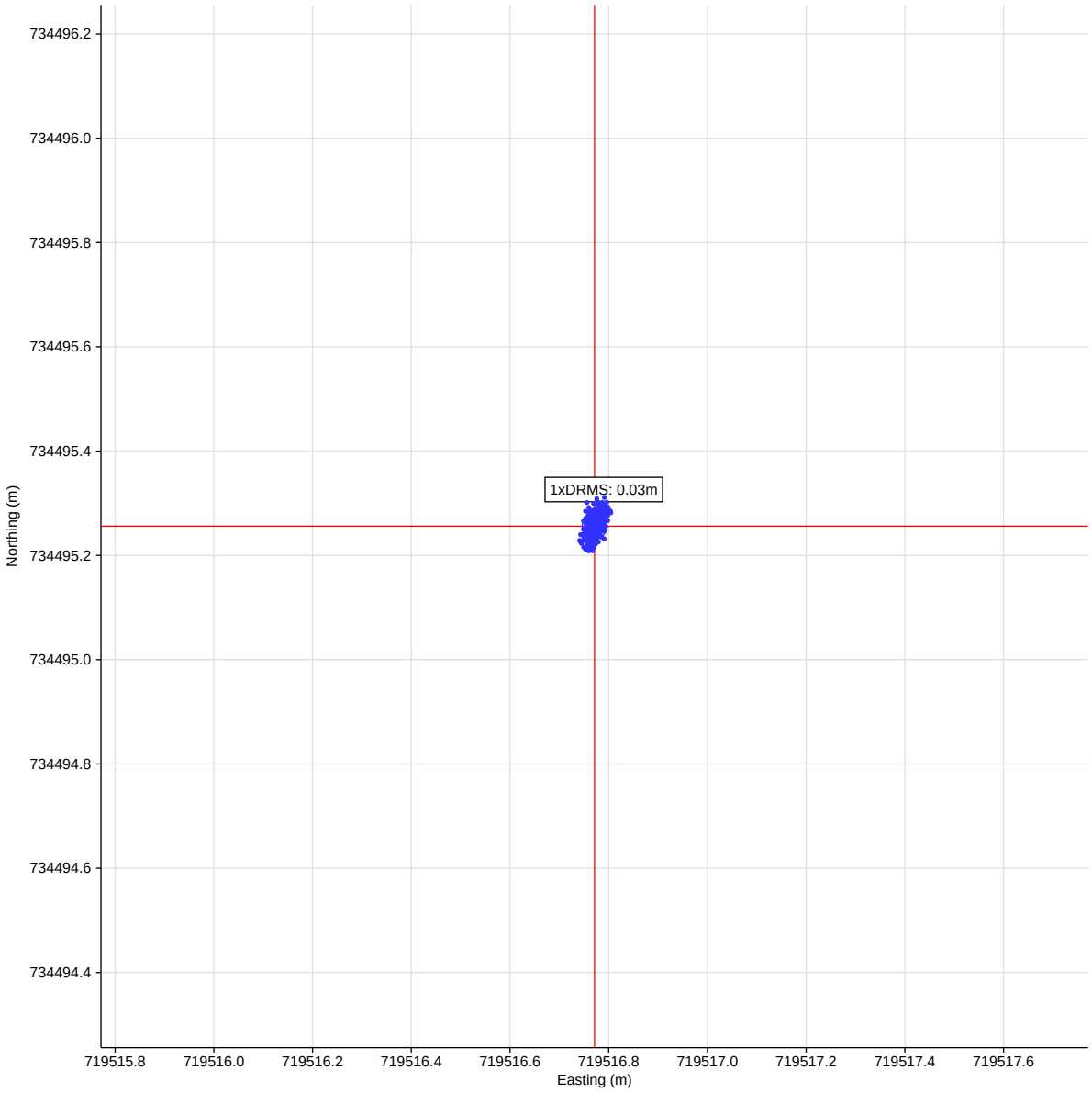
Client Representative

Client

Geodetic Parameters

Name : IRENET95 / Irish Transverse Mercator [EPSG-Ire]		
EPSG Code	EPSG::2157	
Local Geodetic Datum Parameters		
Datum	IRENET95	EPSG::6173
Ellipsoid	GRS 1980	
Semi major axis	a = 6,378,137.000 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from WGS 84 to IRENET95		
X-axis translation	0 m	
Y-axis translation	0 m	
Z-axis translation	0 m	EPSG::1678
Local Projection Parameters		
Map Projection	Transverse Mercator	
Grid System	Irish Transverse Mercator	EPSG::19962
Latitude Origin	53°30’00.000”N	
Central Meridian	008°00’00.000”W	
Scale Factor on Central Meridian	0.99982	
False Easting	600,000 m	
False Northing	750,000 m	

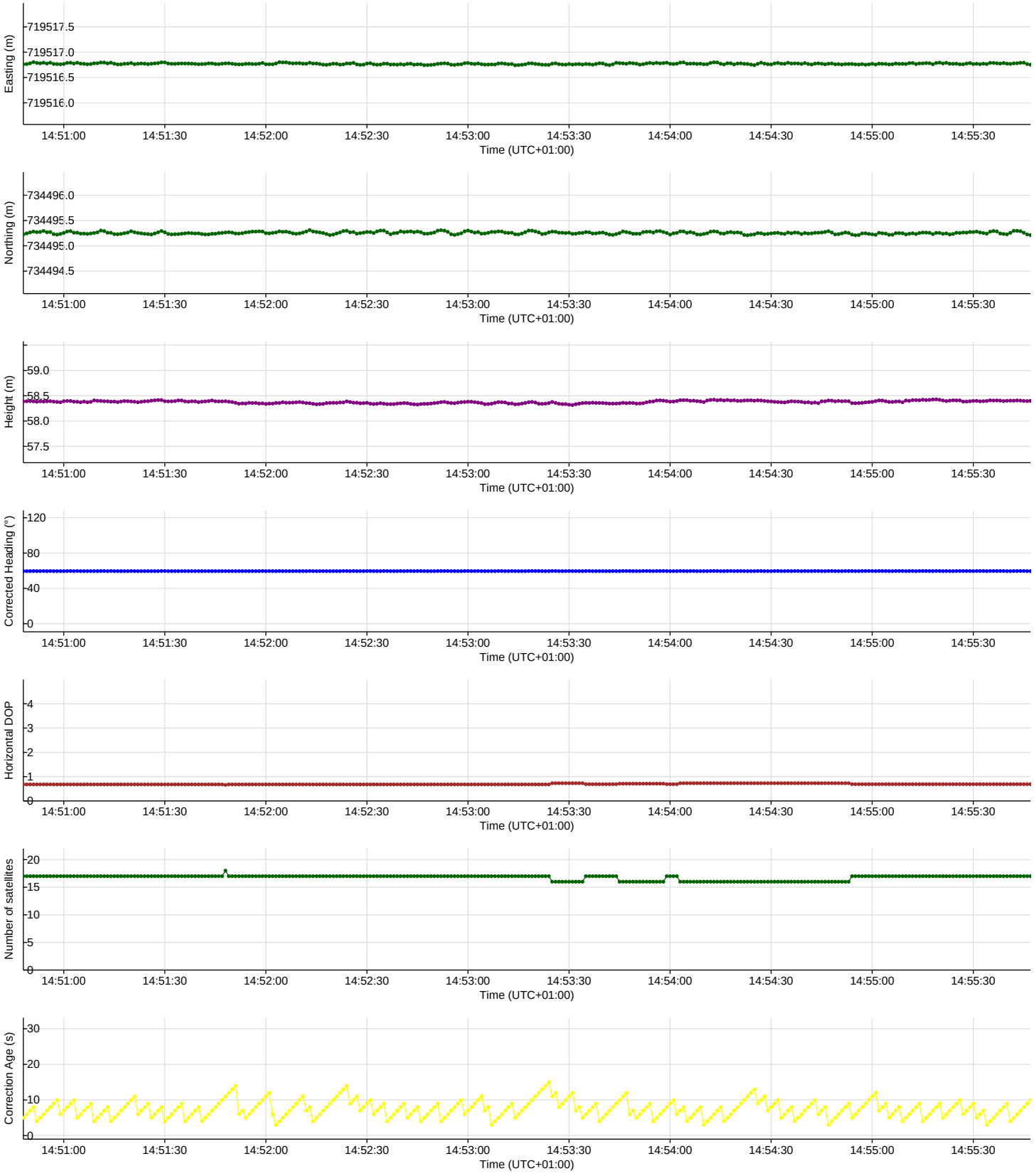
Scatter Plot



Mean Position

	Easting	Northing
Aran 120A	719,516.771m E	734,495.256m N

Time Series Plots for Aran 120A



STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=8.2M DTW=0.8M CD=4.7M ODM=2.1M		

Session Name: Goose Map 20180815-132131 Records Used: 300 of 300

Start Time: 15 Aug 2018, 14:21:31+01:00 End Time: 15 Aug 2018, 14:26:31+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34714°N	53.34714°N
Longitude	6.20549°W	6.20549°W
Height	58.136m Ell.	58.136m Ell.
Easting	719,482.810m E (SD: ±0.02m)	
Northing	734,491.977m N (SD: ±0.03m)	
Height	1.804m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	331.55°T 330.11°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	36
Easting	719,482.772m E
Northing	734,491.965m N
Range	0.04m Geodetic
Bearing TO	253.11°True
Bearing FROM	73.11°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=16.9M DTW=5.0M CD=6.3M ODM=3.8M		

Session Name: Goose Map 20180817-081018 Records Used: 300 of 300

Start Time: 17 Aug 2018, 09:10:18+01:00 End Time: 17 Aug 2018, 09:15:18+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34542°N	53.34542°N
Longitude	6.20523°W	6.20523°W
Height	59.794m Ell.	59.794m Ell.
Easting	719,504.892m E (SD: ±0.01m)	
Northing	734,301.548m N (SD: ±0.01m)	
Height	3.464m Ort. (SD: ±0.01m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	339.09°T 337.65°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	37
Easting	719,483.593m E
Northing	734,273.784m N
Range	34.99m Geodetic
Bearing TO	218.93°True
Bearing FROM	38.93°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	Comment DTM=6.20M DTW=0.50M DHA CD= 2.10M DHA ODM -0.50M		

Session Name: Goose Map 20180817-213746 Records Used: 300 of 300

Start Time: 17 Aug 2018, 22:37:46+01:00 End Time: 17 Aug 2018, 22:42:46+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34708°N	53.34708°N
Longitude	6.20432°W	6.20432°W
Height	55.565m Ell.	55.565m Ell.
Easting	719,560.713m E (SD: ±0.01m)	
Northing	734,487.757m N (SD: ±0.03m)	
Height	-0.766m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	221.79°T 220.35°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	38
Easting	719,561.858m E
Northing	734,488.944m N
Range	1.65m Geodetic
Bearing TO	45.40°True
Bearing FROM	225.40°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=4.30M DTW=0.70M DHA CD= 3.10M DHA ODM 0.60M		

Session Name: Goose Map 20180817-192925 Records Used: 300 of 300

Start Time: 17 Aug 2018, 20:29:25+01:00 End Time: 17 Aug 2018, 20:34:25+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P2		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34710°N	53.34710°N
Longitude	6.20388°W	6.20388°W
Height	56.596m Ell.	56.596m Ell.
Easting	719,590.303m E (SD: ±0.01m)	
Northing	734,490.545m N (SD: ±0.01m)	
Height	0.266m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	138.99°T 137.55°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	39
Easting	719,591.684m E
Northing	734,489.694m N
Range	1.62m Geodetic
Bearing TO	123.08°True
Bearing FROM	303.08°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=9.8M DTW=0.9M CD=2.3M ODM=0.2M		

Session Name: Goose Map 20180818-085034 Records Used: 300 of 300

Start Time: 18 Aug 2018, 09:50:34+01:00 End Time: 18 Aug 2018, 09:55:34+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34622°N	53.34622°N
Longitude	6.20436°W	6.20436°W
Height	55.910m Ell.	55.910m Ell.
Easting	719,560.836m E (SD: ±0.02m)	
Northing	734,391.222m N (SD: ±0.02m)	
Height	-0.419m Ort. (SD: ±0.03m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	274.59°T 273.15°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	40
Easting	719,560.977m E
Northing	734,391.510m N
Range	0.32m Geodetic
Bearing TO	27.55°True
Bearing FROM	207.55°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=6.2M DTW=0.5M CD=4.4M ODM=1.9M		

Session Name: Goose Map 20180817-162451 Records Used: 300 of 300

Start Time: 17 Aug 2018, 17:24:51+01:00 End Time: 17 Aug 2018, 17:29:51+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34620°N	53.34620°N
Longitude	6.20393°W	6.20393°W
Height	57.893m Ell.	57.893m Ell.
Easting	719,589.038m E (SD: ±0.04m)	
Northing	734,389.779m N (SD: ±0.02m)	
Height	1.564m Ort. (SD: ±0.04m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	0.03°T 358.58°G	±0.1°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	41
Easting	719,589.526m E
Northing	734,387.441m N
Range	2.39m Geodetic
Bearing TO	169.64°True
Bearing FROM	349.64°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=9.0M DTW=0.8M CD=1.9M ODM=0.6M		

Session Name: Goose Map 20180818-095920 Records Used: 300 of 300

Start Time: 18 Aug 2018, 10:59:20+01:00 End Time: 18 Aug 2018, 11:04:20+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P1		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34539°N	53.34539°N
Longitude	6.20445°W	6.20445°W
Height	55.443m Ell.	55.443m Ell.
Easting	719,556.931m E (SD: ±0.01m)	
Northing	734,298.981m N (SD: ±0.01m)	
Height	-0.886m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	267.29°T 265.85°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	42
Easting	719,557.172m E
Northing	734,299.124m N
Range	0.28m Geodetic
Bearing TO	60.87°True
Bearing FROM	240.87°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

STARFIX

MEAN POSITION REPORT

Project ID	181506.04 Dublin		
Project Name	Dublin Port Project		
Fugro OPCO	FSLTD (Fugro Survey Ltd.,Aberdeen)	**Location**	Dublin
Client	Fugro Geoservices Inc	**Vessel**	Aran 120A
Comment	DTM=8.M DTW=0.5 CD=4.3M ODM=1.8M		

Session Name: Goose Map 20180817-153448 Records Used: 300 of 300

Start Time: 17 Aug 2018, 16:34:48+01:00 End Time: 17 Aug 2018, 16:39:48+01:00 Session Length: 00:05:00

Mean Position for Aran 120A P3		
	IRENET95 / Irish Transverse Mercator [EPSG-Ire]	**WGS 84(2D)**
Latitude	53.34536°N	53.34536°N
Longitude	6.20401°W	6.20401°W
Height	57.866m Ell.	57.866m Ell.
Easting	719,586.305m E (SD: ±0.03m)	
Northing	734,296.067m N (SD: ±0.02m)	
Height	1.538m Ort. (SD: ±0.02m Ort.)	

Sensors	**Sensor Averages**	**SD**
Heading	101.48°T 100.04°G	±0.0°
Pitch		
Roll		
Depth (Sounder)	0.0m	±0.00m
Depth (Manual)	0.0m	N/A

Mean Position to Waypoint	
Waypoint	43
Easting	719,584.697m E
Northing	734,296.031m N
Range	1.61m Geodetic
Bearing TO	270.17°True
Bearing FROM	90.17°True

Party Chief

Party Chief

FGSL (Fugro GeoServices Ltd UK)

Client

Client Representative

Client

F. MARINE ACTIVITIES

Daily Progress Reports 90 Pages

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

01 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Thursday 09-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

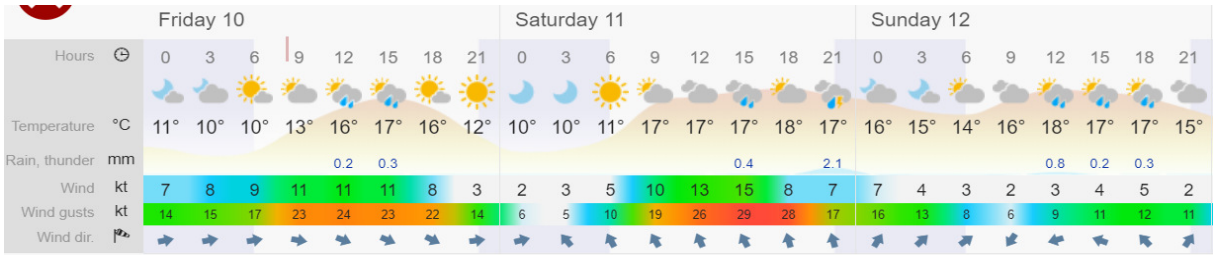
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	15	W	N/A	In Port	Good	Weather Forecast indicates suitable weather window to commence tow to site an commence works.
06:00	14	W	0.2	In Port	Good	
12:00	12	WSW	0.2	In Port	Good	
18:00	10	S	0.2	In Port	Good	
00:00	0	S	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL BH 75	6	8	8	7.5	**Mobilisation complete and tow to works area North of Great South Wall / Stand off and await HW slack to make approach to BL-BH75.**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:30	07:30		Awaiting Night shift to commence once site works commence
07:30	08:00	00:30	Shift Change	**SOS** Briefing: TBT
08:00	11:00	03:00	Mobilisation	Continue mobilisation: JUIC Form complete and all deck items sea fastened in preparation for transept to first site location.
11:00	14:00	03:00	Shipping delay	DPC VTS contacted and provisional time to move off 15:00 / 13:15: 2 No client HSE reps on board to inspect prior to move
14:00	15:15	01:15	Jacking Operations	Commence jacking down into water in preparation for move to site / MTS Taktow alongside to commence connect towing bridle
15:15	16:30	01:15	Move Location	Commence tow once VTS approve passage from berth 18 to BH 75 / 16:25 Due to tidal restrictions JUB unable to approach until HW
16:30	17:50	01:20	Jacking Operations	Commence jacking 100m from position as target location is tidal restricted. Parking position agreed with DPC VTS
17:50	18:20	00:30	Other Operations	Preparing for rig to be left in position overnight / Prepare for disembark to Poolbeg Marina / MTS Taktow away to berth 18
18:20	19:30	01:10	Shift Change	Disembark to Poolbeg Marina via Sea Safari transfer vessel
19:30	24:00	04:30		Night shift commencing 11/08/18

Weather Forecast



Work planned - next 24hrs:

Commence drilling on BH 75 once HW tide allows access

Health Safety & the Environment

TBT, tow planning, DPC H&S inspections complete, JUIC and tow worthiness checks complete

Fugro GeoServices: Colin Mulvey	Client Rep: Joseph McGrath
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No. 01 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	3.00	0.00
Move to new Area	0.00	0.00
Move Location	1.25	1.25
CP Drilling	0.00	0.00
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	1.67	1.67
Other Operations	0.50	0.50
Down Time Weather	0.00	0.00
Down Time Fugro	0.00	0.00
Down Time Client	0.00	0.00
Shipping delay	3.00	3.00
Jacking Operations	2.58	2.58
MMO Watch	0.00	0.00
MMO Downtime	0.00	0.00
TOTAL	12.00	12.00

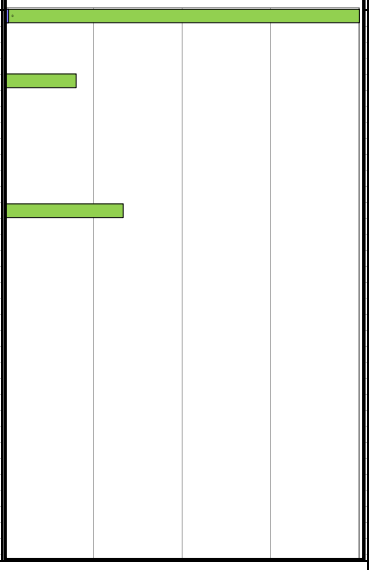
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master		
Jimmy Wilson	Fugro / Barge Master		
Carl Redpath	Fugro /Driller		
Jake Warner	Fugro /AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech		
Total Personnel	6	Hours Worked	72

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1			1.0		0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0.0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	1	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	0.00
Advance BH between ground level and 10m depth	B5							0.00	0	0.00
Advance BH between 10m and 20m	B6							0.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0.0	0.00
								0.00	0.0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3			1		0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3			0.00			0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30					0.00	0	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	0	0.00
Retrieval / storage of surface samples at depth			10					0.00	0	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	1	1
Safety Drills	0	0
Tool Box Talks	3	3
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	72	72

Lost & Damaged

Fugro Representative Comments

Mobilisation operations & tow to site complete; Daily meeting with DPC VTS @ 10:30 to ensure all aspects of works are communicated effectively.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep: Joseph McGrath

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

02 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Friday 10-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

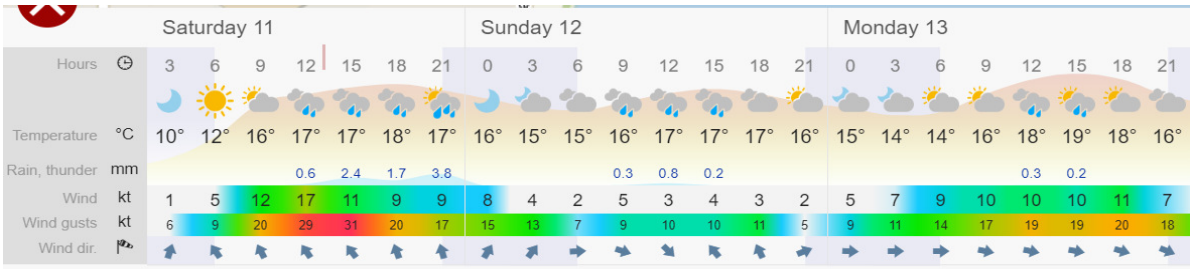
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	15	W	N/A	In Port	Good	Weather Forecast indicates suitable weather window to continue drilling on site.
06:00	14	W	0.2	In Port	Good	
12:00	12	WSW	0.2	In Port	Good	
18:00	10	S	0.2	In Port	Good	
00:00	0	S	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL BH 75	0.8	1.2	0.3	1.2	Entre works area at BH 75, North of Great South Wall / Commence CP drilling / Crew change and awaiting night shift to commence.

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:30	07:30		Awaiting Night shift to commence once site works commence
07:30	08:00	00:30	Shift Change	**SOS** Briefing: TBT / Barge induction for Client Representative
08:00	10:10	02:10	Down Time Tide	100m from position as target location is tidal restricted. Awaiting rising tide as HW @ 11:34 to commence approach
10:10	11:05	00:55	Move Location	DPC VTS contacted and informed to move to BH 75 / MTS Taktow on standby / 10:50 MTS Taktow away to berth 18
11:05	11:30	00:25	Jacking Operations	Commence jacking up / At working height / 11:30 MMO watch complete / BH position contains remnants of old jetty and outfall
11:30	18:20	06:50	CP Drilling	Commence Grab sample for S05 / Commence CP drilling operations on BL - BH 75 / 12.05m at EOS
18:20	19:00	00:40	Jacking Operations	Jacking up to ensure clearance for tide overnight and fuel up
19:00	19:30	00:30	Shift Change	Preparing for rig for overnight / Prepare for disembark to Poolbeg Marina / 19:10 CTV alongside and crew away
19:30	19:30	00:00	Shift Change	Disembark to Poolbeg Marina via Sea Safari transfer vessel
19:30	24:00	04:30		Night shift commencing 11/08/18

Weather Forecast



Work planned - next 24hrs:

Commence drilling on BH 75 once HW tide allows access

Health Safety & the Environment

TBT, Rig induction.

Fugro GeoServices: Colin Mulvey	Client Rep: Joseph McGrath
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No. 02 Rev0

Activity Time Summary

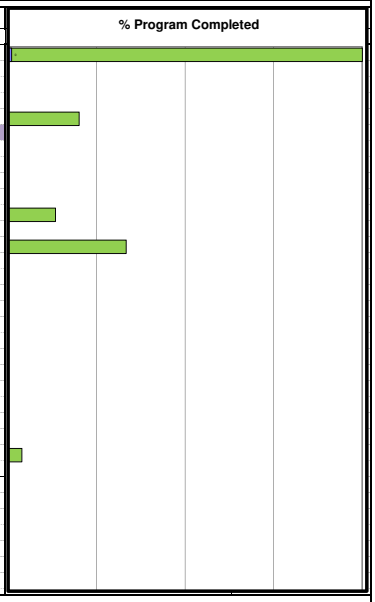
Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	0.92	2.17
CP Drilling	6.83	6.83
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	1.00	2.67
Other Operations	0.00	0.50
Down Time Weather	0.00	0.00
Down Time Fugro	0.00	0.00
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	1.08	3.67
MMO Watch	0.00	0.00
MMO Downtime	0.00	0.00
Down Time Tide	2.17	2.17
TOTAL	12.00	24.00

Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master		
Jimmy Wilson	Fugro / Barge Master		
Carl Redpath	Fugro /Driller		
Jake Warner	Fugro /AD		
Stuart Nye	Fugro /AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech		
William Lowry	Fugro / Geotech		
Rebekka McIllwain	RE		
Total Personnel	9	Hours Worked	108

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	1	0.00
Break out surface obstructions where present	B3			R/O			1	0.00	0	1.10
Advance BH between ground level and 10m depth	B4				10.0			10.00	0	0.00
Advance BH between 10m and 20m	B5				2.05			2.05	0	0.00
Advance BH between 20m and 30m	B6							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15			2.00			2.00	0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3			0.00			0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			9		0.00	9	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			1		0.00	1	0.00
Retrieval / storage of surface samples at depth			10					0.00	0	0.00



Health & Safety Summary	Today	Actual To Date
Hoc Cards	2	2
Safety Drills	0	0
Tool Box Talks	3	3
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	108	180

Lost & Damaged

Fugro Representative Comments

Tidal restrictions may reduce the opportunities to move to BH location coupled with the lack of MMO watch requirements over nights. This will be monitored and control via FGSL and VTS personnel.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep: Joseph McGrath

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

03 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Saturday 11-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

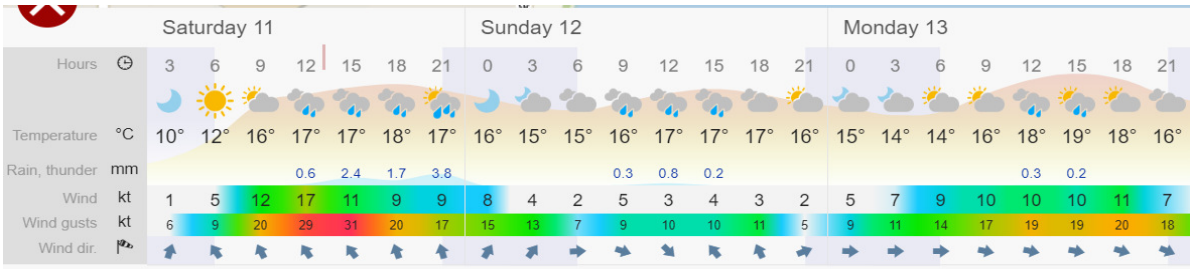
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	15	SSE	N/A	In Port	Good	Weather Forecast indicates unfavourable weather to move due to high winds expected after midday and tonight.
06:00	15	SSE	0.2	In Port	Good	
12:00	19	SSE	0.2	In Port	Good	
18:00	28	SSE	0.2	In Port	Good	
00:00	14	SSE	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL BH 75	0.8	1.2	0.3	1.2	**Complete BH75 and prepare barge for incoming weather / WOW / Night shift t restricted due to tide time and weather restricting move to site**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:30	07:30		Awaiting Night shift to commence once site works commence
07:30	08:30	01:00	Down Time Tide	Waiting on tide to Transit to Rig
08:30	09:30	01:00	Shift Change	Transit to rig / SOS Briefing: TBT / Barge induction for Client Representative / MMO watch commenced
09:30	10:20	00:50	MMO Watch	Waiting on MMO clearance / MMO watch complete and permission to drill received @ 10:20
10:20	13:50	03:30	CP Drilling	Continue drilling operations on BL - BH 75 from 12.05m to 20.00m **EOH** accepted by Byrne Looby via phone call
13:50	14:10	00:20	Other Operations	Commence removal of casing to deck
14:10	14:30	00:20	Down Time Weather	High winds and swell realised as per weather forecast / Crew disembark as tide may increase risk of removal to shore
14:30	19:30	05:00	Down Time Weather	Waiting on weather (WOW) +24Knts/s restricting crew change capacity / Awaiting break in weather to commence night shift
19:30	19:45	00:15	Shift Change	Crew assess possibility of accessing barge to commence night shift however due to building weather night shift abandoned
19:45	24:00	04:15	Down Time Weather	Waiting on weather (WOW) +24Knts/s restricting crew change capacity / Awaiting break in weather to commence night shift

Weather Forecast



Work planned - next 24hrs:

WOW: Return to Barge once tide allows and commence preservation to move to S14 and depending on tide complete S12 before commencing S17 and BL BH59.

Health Safety & the Environment

TBT, Rig induction & M.O.B drill completed.

Fugro GeoServices: Colin Mulvey	Client Rep: Joseph McGrath
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No. 03 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	0.00	2.17
CP Drilling	3.50	10.33
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	1.25	3.92
Other Operations	0.33	0.83
Down Time Weather	9.58	9.58
Down Time Fugro	0.00	0.00
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	0.00	3.67
MMO Watch	0.83	0.83
MMO Downtime	0.00	0.00
Down Time Tide	1.00	3.17
TOTAL	**16.50**	**40.50**

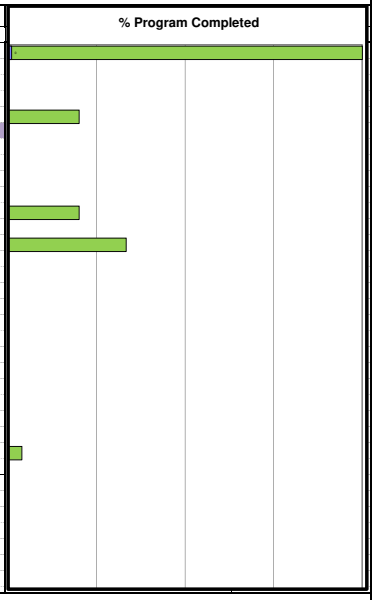
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master		
Jimmy Wilson	Fugro / Barge Master		
Carl Redpath	Fugro /Driller		
Jake Warner	Fugro /AD		
Stuart Nye	Fugro /AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech		
William Lowry	Fugro / Geotech		
Joseph McGrath	RE		
Total Personnel	9	Hours Worked	108

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	1	0.00
Break out surface obstructions where present	B3			R/O			1	0.00	0	2.20
Advance BH between ground level and 10m depth	B5							10.00	0	0.00
Advance BH between 10m and 20m	B6				7.95			10.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15			1.00			3.00	0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			1		0.00	10	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	1	0.00
Retrieval / storage of surface samples at depth			10					0.00	0	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	2	2
Safety Drills	0	0
Tool Box Talks	3	3
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	108	288

Lost & Damaged

Fugro Representative Comments

Tidal restrictions realised and difficulty in access the barge during crew change around LW and moving the barge on some positions may require HW access. Weather conditions forecast for the weekend realised and reduction of shifts observed as access during night shift tis not safe should weather conditions detreated as forecasted.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep: Joseph McGrath

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

04 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Sunday 12-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

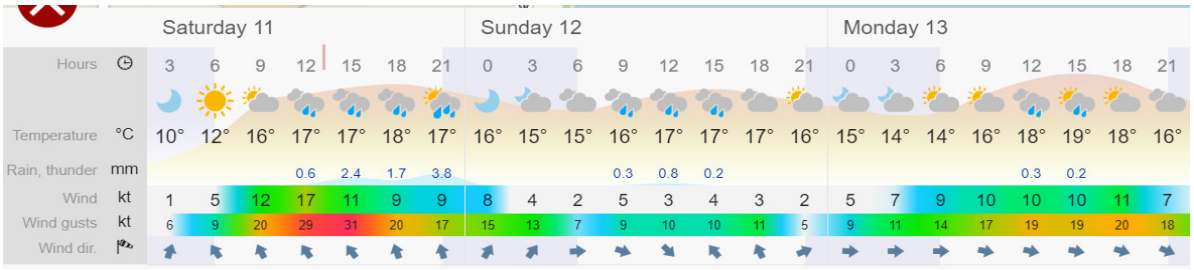
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	4	SSE	N/A	In Port	Good	Weather Forecast indicates unfavourable weather to move due to high winds expected after midday and tonight.
06:00	4	SSE	0.2	In Port	Good	
12:00	14	SSE	0.2	In Port	Good	
18:00	15	SSE	0.2	In Port	Good	
00:00	10	SSE	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL BH 75	0.8	1.2	0.3	1.2	WOW / Night shift t restricted due to tide time and weather restricting move to site / BH75 complete and prepare barge for move to S17 on approach of HW @ 14:00 / Commence move to BH 59 with 3 Grab samples taken (S14 S19 & S17) / Shift change / Night shift commence and continue drilling operations on BH59
BL BH 59	8.1	8.1	8.6	8.6	

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:30	07:30	Down Time Weather	Waiting on weather (WOW) +24Knts/s restricting crew change capacity / Awaiting break in weather to commence night shift
07:30	09:00	01:30	Down Time Tide	Waiting on tide to Transit to Rig
09:00	09:30	00:30	Shift Change	Transit to rig / SOS Briefing: TBT / Barge induction for Client Representative
09:30	10:50	01:20	Down Time Tide	Waiting on Tide to move to S14
10:50	11:15	00:25	Jacking Operations	Jacking down in preparation to move to next location
11:15	11:25	00:10	Move Location	Move to S14 Location
11:25	11:50	00:25	Other Operations	Grab Sample S14
11:50	12:20	00:30	Move Location	Move to S19 Location
12:20	12:55	00:35	Other Operations	Grab Sample S19
12:55	13:20	00:25	Move Location	Move to BL-BH 59
13:20	14:00	00:40	Jacking Operations	Commence jacking on BH59 Location / MMO commenced 13:40
14:00	14:10	00:10	MMO Watch	MMO watch complete
14:10	15:30	01:20	CP Drilling	Commence S17 Grab Sample / Commence CP Drilling operations
15:30	16:50	01:20	Down Time Fugro	Hose pipe required changing / Pre emptied shut done to ensure minimum hydraulic fluid leak
16:50	17:35	00:45	MMO Watch	Awaiting MMO Watch / MMO complete
17:35	19:00	01:25	CP Drilling	Recommence drilling operations
19:00	19:25	00:25	Shift Change	Dayshift return to shore / Nightshift transfer to JUB to commence first nightshift
19:25	24:00	04:35	CP Drilling	Continue CP drilling operations / **End of Reporting Period**

Weather Forecast



Work planned - next 24hrs:

WOW: Return to Barge once tide allows and commence preservation to move to S14 and depending on tide complete S12 before commencing S17 and BL BH59.

Health Safety & the Environment

TBT, Rig induction

Fugro GeoServices: Colin Mulvey	Client Rep: Joseph McGrath
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

04 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	1.08	3.25
CP Drilling	7.33	17.67
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	0.92	4.83
Other Operations	1.00	1.83
Down Time Weather	7.50	17.08
Down Time Fugro	1.33	1.33
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	1.08	4.75
MMO Watch	0.92	1.75
MMO Downtime	0.00	0.00
Down Time Tide	2.83	6.00
TOTAL	**24.00**	**64.50**

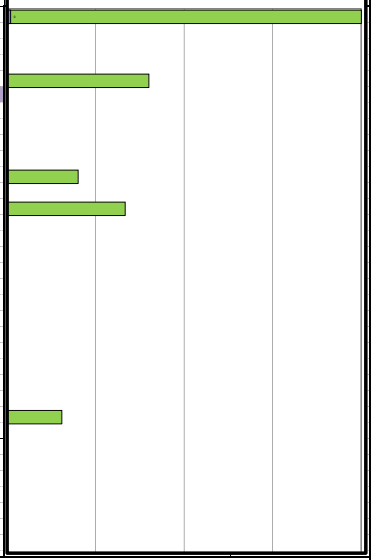
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Barge Master
Carl Redpath	Fugro /Driller	Adam Cooke	Fugro / AD
Jake Warner	Fugro /AD	Stuart Nye	Fugro / AD
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Gre Harkin	RE		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	2	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				10.0			20.00	0	0.00
Advance BH between 10m and 20m	B6				5.00			15.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30					0.00	10	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			3		0.00	4	0.00
Retrieval / storage of surface samples at depth			10					0.00	0	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	2	2
Safety Drills	0	0
Tool Box Talks	3	3
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	408

Lost & Damaged

Fugro Representative Comments

Tidal restrictions realised and difficulty in access the barge during crew change around LW and moving the barge on some positions may require HW access. Weather conditions forecast for the weekend realised and reduction of shifts observed as access during night shift tis not safe should weather conditions detreated as forecasted.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep: Joseph McGrath

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

05 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Monday 13-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

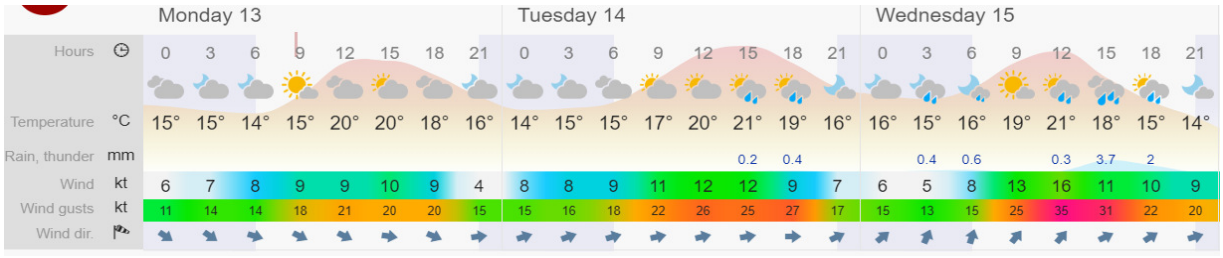
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	4	SSE	N/A	In Port	Good	Weather forecast indicates favourable weather for planned works.
06:00	6	SSE	0.2	In Port	Good	
12:00	9	SSE	0.2	In Port	Good	
18:00	7	SSE	0.2	In Port	Good	
00:00	7	SSE	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL BH 59	8.1	8.1	8.6	8.6	**Continue drilling operation / Complete S1 - S3, S6 & S7 / Prepare for move next location depending on tide**
S6	9.5	10.5	3.2	3.2	

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:00	07:00	Down Time Tide	**Start of Reporting Period** / Waiting on HW to commence move to next location
07:00	07:30	00:30	Shift Change	Nightshift transit to Shore and wasp with Dayshift Transit to Rig
07:30	10:40	03:10	Down Time Tide	Transit to rig / SOS Briefing: TBT / Barge induction for Client Representative
10:40	11:45	01:05	Jacking Operations	Commence jacking down in proration to move the S1
11:45	12:35	00:50	Move Location	Move to S1
12:35	13:07	00:32	Other Operations	Commence grab S1
13:07	13:17	00:10	Move Location	Commence move to S2
13:17	13:50	00:33	Other Operations	Commence grab sample S2
13:50	14:05	00:15	Move Location	Commence move to S3
14:05	14:25	00:20	Other Operations	Commence grab sample S3
14:25	14:40	00:15	Move Location	Commence move to S7
14:40	15:00	00:20	Other Operations	Commence grab sample S7
15:00	15:20	00:20	Move Location	Commence move to S6
15:20	17:00	01:40	Jacking Operations	On position and commence jacking operations
17:00	17:30	00:30	MMO Watch	MMO Watch complete and commence CP drilling operations
17:30	19:10	01:40	CP Drilling	CP Drilling on S6
19:10	19:30	00:20	Shift Change	Dayshift transit to shore / Nightshift transit to rig / **SOS Briefing**: TBT / MMO Watch commenced
19:30	20:00	00:30	MMO Watch	MMO Watch complete and commence CP drilling operations on S6
20:00	22:50	02:50	CP Drilling	Drilling operation on S6 complete at 3.0m
22:50	23:10	00:20	Jacking Operations	Jacking down in preparation to move once tide allows
23:10	24:00	00:50	Down Time Tide	Waiting on HW to allow barge to move to next location / **End of Reporting Period**

Weather Forecast



Work planned - next 24hrs:

Commence move to S10 and commenced drilling once MMO is complete / Utilise midday HW to complete as many locations as possible in the tidal window

Health Safety & the Environment

TBT, Rig induction

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

05 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	1.83	5.08
CP Drilling	4.50	22.17
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	0.83	5.67
Other Operations	1.75	3.58
Down Time Weather	0.00	17.08
Down Time Fugro	0.00	1.33
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	3.08	7.83
MMO Watch	1.00	2.75
MMO Downtime	0.00	0.00
Down Time Tide	11.00	17.00
TOTAL	**24.00**	**88.50**

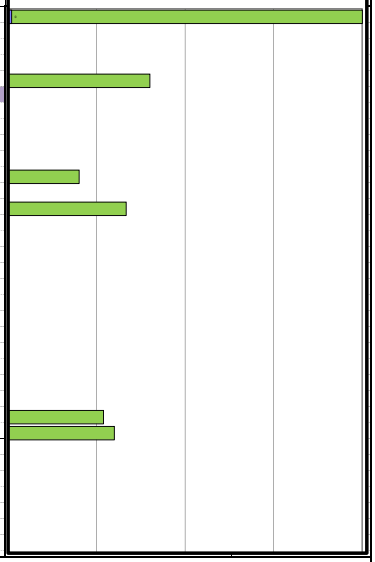
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro /Driller	Stuart Nye	
Jake Warner	Fugro /AD	Adam Cooke	
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Ciara Devine	RE		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	2	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5							20.00	0	0.00
Advance BH between 10m and 20m	B6				5.00			20.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			1		0.00	11	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			3		0.00	7	0.00
Retrieval / storage of surface samples at depth			10			3		0.00	3	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	4
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	528

Lost & Damaged

Fugro Representative Comments

Tidal restrictions realised and difficulty in access at Dayshift nightshift crew change resulting in an earlier than normal crew change. This is likely to effect the coming 3 changes going forward.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

06 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Tuesday 14-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
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cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

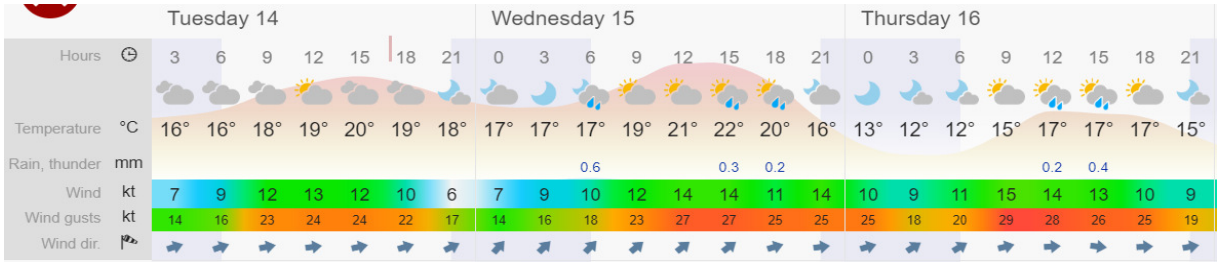
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	4	SSE	N/A	In Port	Good	Weather forecast indicates favourable weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	6	SSE	0.2	In Port	Good	
12:00	9	SSE	0.2	In Port	Good	
18:00	7	SSE	0.2	In Port	Good	
00:00	7	SSE	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
S6	9.5	10.5	3.2	3.2	**Continue drilling operation / Completed S10, 13, 15, / Prepare for move next location S4, depending on tide**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	01:35	01:35	Down Time Weather	**Start of Reporting Period** / WOW, Wind +24Knts/s to move position / Awaiting break in weather to commence move
01:35	04:10	02:35	Move Location	Jack down and commence move to S10 / On location at S10
04:10	07:00	02:50	MMO Downtime	Awaiting MMO watch in daylight hours to commence CP drilling on S10
07:00	07:15	00:15	Shift Change	Nightshift Transit to shore
07:15	09:30	02:15	Down Time Tide	Awaiting tide to rise to allow access to JUB / Expected departure to Barge 09:15
09:30	09:45	00:15	Shift Change	Dayshift transfer to JUB / **SOS Briefing**: TBT
09:45	10:15	00:30	MMO Watch	MMO Watch commend / MMO Watch confirmed
10:15	12:00	01:45	CP Drilling	Commence CP drilling operation on S10 / Drilling operations complete
12:00	13:15	01:15	Down Time Tide	Awaiting HW to move to S13
13:15	14:00	00:45	Move Location	Water level high enough to commence move to S13 / Jack down and commence move / 15:00 On position
14:00	14:15	00:15	Other Operations	Sample taken for S13
14:15	15:00	00:45	Move Location	Commence move to S15 / Drilling operations complete
15:00	15:33	00:33	MMO Watch	MMO Watch complete and commence CP drilling operations
15:33	15:50	00:17	CP Drilling	Commence CP Drilling on S15 / Drilling complete
15:50	16:40	00:50	Move Location	Move to S25
16:40	17:00	00:20	CP Drilling	Grab sample taken at S25
17:00	18:10	01:10	Move Location	Move to S12
18:10	19:05	00:55	Jacking Operations	Commence jacking operations up to level suitable for disembarking and taking Grab Sample S12 / **EOS**
19:05	19:40	00:35	Shift Change	Dayshift transit to shore / Nightshift transit to rig / **SOS** Briefing: TBT
19:40	20:10	00:30	MMO Watch	MMO Watch commenced / MMO Watch complete and commence CP drilling operations on S6
20:10	20:35	00:25	Other Operations	Commence grab sample S12
20:35	21:35	01:00	Down Time Tide	Waiting on HW to allow barge to move to next location S4 / **End of Reporting Period**

Weather Forecast



Work planned - next 24hrs:

Commence move to S4 and commenced drilling once MMO is complete / Utilise midday HW to complete move to Berth 3 location as possible in the tidal window

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

06 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	6.08	11.17
CP Drilling	2.37	24.53
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	1.08	6.75
Other Operations	0.67	4.25
Down Time Weather	1.58	18.67
Down Time Fugro	0.00	1.33
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	0.92	8.75
MMO Watch	1.55	4.30
MMO Downtime	2.83	2.83
Down Time Tide	4.50	21.50
TOTAL	**21.58**	**110.08**

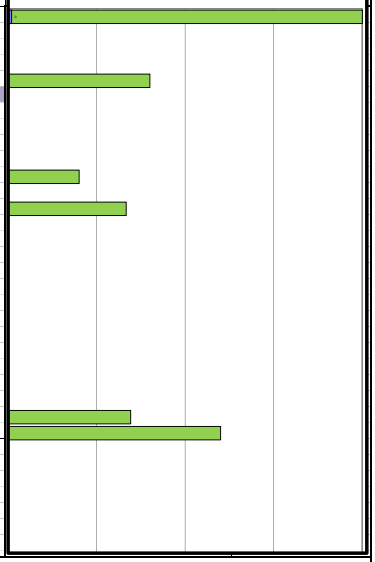
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro /Driller	Stuart Nye	
Jake Warner	Fugro /AD	Adam Cooke	
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Ciara Devine	RE		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	2	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5							20.00	0	0.00
Advance BH between 10m and 20m	B6							20.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	0	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30					0.00	11	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			2		0.00	9	0.00
Retrieval / storage of surface samples at depth			10			3		0.00	6	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	5
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	648

Lost & Damaged

Fugro Representative Comments

Tidal delays should only persist for one more 24hr period as once S4 is complete in area all location North of Great South Wall will be complete.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

07 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Wednesday 15-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

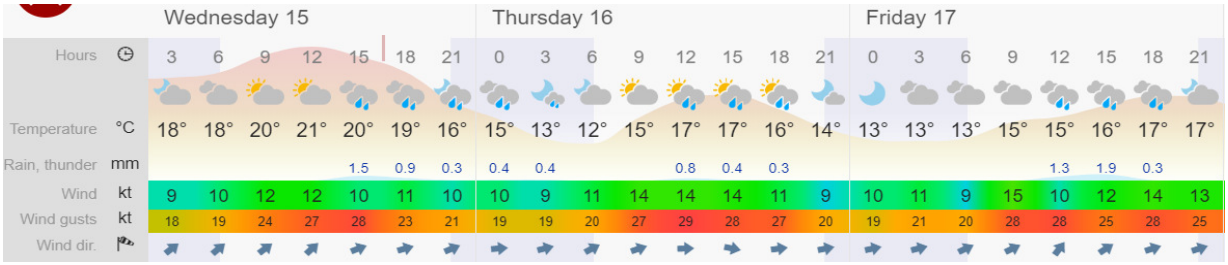
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	4	SSE	N/A	In Port	Good	Weather forecast indicates favourable weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	6	SSE	0.2	In Port	Good	
12:00	9	SSE	0.2	In Port	Good	
18:00	7	SSE	0.2	In Port	Good	
00:00	7	SSE	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-17	3.2	3.2	3.2	3.2	**Completed S4 / Prepare for move next location S4, Waiting on tide / Move to S35 and BH17 / Commence drilling on BH17**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	00:30	00:30	Down Time Tide	**Start of Reporting Period** / Awaiting HW to move to S4
00:30	02:30	02:00	Move Location	Jack down and commence move to S4 / On location at S4 / Jacking up and preloading in preparation for drilling
02:30	07:15	04:45	MMO Downtime	Awaiting MMO watch in daylight hours to commence CP drilling on S4
07:15	07:30	00:15	Shift Change	Nightshift Transit to shore
07:30	08:30	01:00	Down Time Tide	Awaiting tide to rise to allow access to JUB / Expected departure to Barge 09:10
08:30	08:45	00:15	Shift Change	Dayshift transfer to JUB / **SOS Briefing**: TBT
08:45	09:10	00:25	MMO Watch	MMO Watch commend / MMO Watch confirmed
09:10	09:40	00:30	CP Drilling	Commence CP drilling operation on S4 / Drilling operations complete
09:40	12:45	03:05	Down Time Tide	Awaiting HW to move to S36
12:45	13:05	00:20	Jacking Operations	Water level high enough to commence move to S36 / Jack down and commence move
13:05	13:30	00:25	Shipping delay	Awaiting VTS permission to cross the channel to new area
13:30	14:35	01:05	Move to new Area	Commence move to Oil Berth Area S36 / Complete Grab S36
14:35	15:05	00:30	MMO Downtime	Move to S35 & await MMO Watch to commence for CP drilling operations
15:05	15:45	00:40	MMO Watch	Watch commenced / Watch complete
15:45	16:10	00:25	CP Drilling	Commence CP drilling on S36
16:10	16:40	00:30	Move Location	Move to BH-BH 17
16:40	18:00	01:20	Jacking Operations	Commence jacking operations in preparation for Drill BL-BH-17
18:00	19:00	01:00	Other Operations	Commence checks to jacking ram prior to commencing deep borehole / **EOS**
19:00	19:30	00:30	Shift Change	Dayshift transit to shore / Nightshift transit to rig / **SOS** Briefing: TBT
19:30	19:55	00:25	MMO Watch	MMO Watch commenced / MMO Watch complete and commence CP drilling operations on BL-BH-17
19:55	24:00	04:05	CP Drilling	Commence CP drilling operation on BH17 / BH17 @ 6.00m / **End of Reporting Period**

Weather Forecast



Work planned - next 24hrs:

Continue drilling operations on BH17

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No. 07 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	1.08	1.08
Move Location	2.50	13.67
CP Drilling	5.00	29.53
RC Drilling	0.00	0.00
Surface Sampling	0.00	0.00
Shift Change	1.00	7.75
Other Operations	1.00	5.25
Down Time Weather	0.00	18.67
Down Time Fugro	0.00	1.33
Down Time Client	0.00	0.00
Shipping delay	0.42	3.42
Jacking Operations	1.67	10.42
MMO Watch	1.50	5.80
MMO Downtime	5.25	8.08
Down Time Tide	4.58	28.50
TOTAL	**24.00**	**136.50**

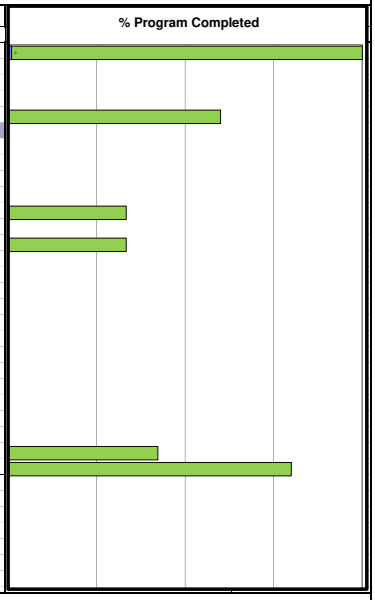
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro /Driller	Stuart Nye	
Jake Warner	Fugro /AD	Adam Cooke	
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Ciara Devine	RE		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	3	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				6.0			26.00	0	0.00
Advance BH between 10m and 20m	B6							20.00	0	0.00
Advance BH between 20m and 30m	B7							0.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15				2.0		3.00	2	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						0.00	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						0.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			3		0.00	14	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			2		0.00	11	0.00
Retrieval / storage of surface samples at depth			10			2		0.00	8	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	6
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	768

Lost & Damaged

Fugro Representative Comments

Tidal delays should only persist for one more 24hr period as once S4 is complete in area all location North of Great South Wall will be complete.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

08 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Thursday 16-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
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cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

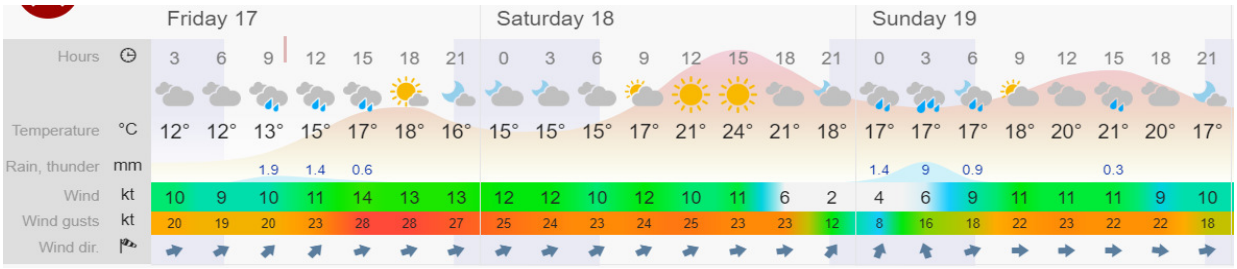
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	15	W	N/A	In Port	Good	Weather forecast indicates favourable weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	13	W	0.2	In Port	Good	
12:00	12	W	0.2	In Port	Good	
18:00	15	W	0.2	In Port	Good	
00:00	12	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-17	3.2	3.2	3.2	3.2	Continue drilling operations on BL-BH-17

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP drilling operation on BL-BH 17 / BH @14.5m / **EOS**
07:15	07:45	00:30	Shift Change	Nightshift Transit to shore / Dayshift transfer to JUB / MMO Watch commend / SOS Briefing: TBT
07:45	08:00	00:15	MMO Watch	MMO Watch complete
08:00	10:50	02:50	CP Drilling	Continue drilling operations on BH17 / 09:00 Geotech received First aid on finger / Drilling ceased as geotech taken ashore
10:50	12:25	01:35	Down Time Fugro	Injured Party taken to A&E for dressing of vut finger (Incident Report complied) PM on deck to take over geotech role
12:25	12:45	00:20	MMO Downtime	Awaiting MMO to commence
12:45	13:15	00:30	MMO Watch	MMO Watch complete
13:15	16:40	03:25	CP Drilling	Continue CP drilling operation / 13:30 / Geotech returend to duty after treatment and continued duites / BH= 25.5
16:40	19:15	02:35	RC Drilling	CPT refusal / Change to RC Drilling / Commecne RC Drilling / CR1 & CR2 complete / BH= 27.95 @ EOS
19:15	20:00	00:45	Shift Change	MMO Watch commenced ./ Dayshift transfered ashore / Nightshift transfer to shore / MMO Completre
20:00	24:00	04:00	RC Drilling	Continue RC Drilling operations / BH= 34.4m @ **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue & complete drilling operations on BH17 / Move to S35 and depdning on weather move to S31 - 33 or move to S42.

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

08 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	0.00
Move Location	0.00	11.17
CP Drilling	13.50	38.03
RC Drilling	6.58	6.58
Surface Sampling	0.00	0.00
Shift Change	1.25	8.00
Other Operations	0.00	4.25
Down Time Weather	0.00	18.67
Down Time Fugro	1.58	2.92
Down Time Client	0.00	0.00
Shipping delay	0.00	3.00
Jacking Operations	0.00	8.75
MMO Watch	0.75	5.05
MMO Downtime	0.33	3.17
Down Time Tide	0.00	23.92
TOTAL	**24.00**	**136.50**

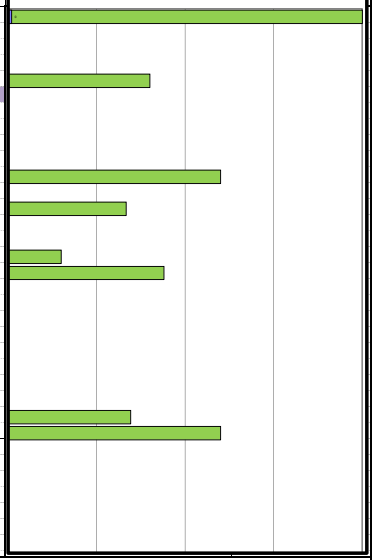
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro /Driller	Stuart Nye	
Jake Warner	Fugro /AD	Adam Cooke	
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
James Martin	RE / Byrne Looby		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	2	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				4.0			24.00	0	0.00
Advance BH between 10m and 20m	B6				10.00			30.00	0	0.00
Advance BH between 20m and 30m	B7				4.0			4.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15				6.0		3.00	6	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30			4.50			4.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10			4.40			4.40	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						0.00	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			8		0.00	19	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	9	0.00
Retrieval / storage of surface samples at depth			10					0.00	6	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	6
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	768

Lost & Damaged

Fugro Representative Comments

Tidal delays should only persist for one more 24hr period as once S4 is complete in area all location North of Great South Wall will be complete.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

FUGRO / DUBLIN PORT Co / BYRNELOOBY	**Dublin Port SI 2 2018** **Aran 120A**	Daily Report No. **09 Rev0**

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Friday 17-Aug-18
To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email
cc		Email		cc		Email

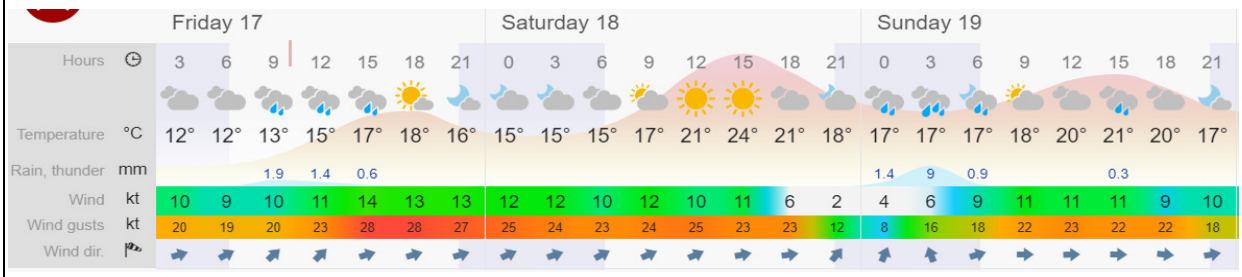
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	18	W	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	19	W	0.2	In Port	Good	
12:00	22	W	0.2	In Port	Good	
18:00	22	W	0.2	In Port	Good	
00:00	26	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-17	3.2	3.2	3.2	3.2	**Complete drilling operations on BL-BH-17 / Move and complete S31 - 34 & S40 - S43 & S38 & S39. WOW to move to next location**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP drilling operation on BL-BH 17 / 04:06 BH @43.3m / Client confirm 05:15 / Pull casing
07:15	07:40	00:25	Shift Change	Nightshift Transit to shore / Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
07:40	10:00	02:20	Other Operations	Continue retrieving casing to deck / Grab Sample S37 taken
10:00	10:20	00:20	Jacking Operations	Jack down in preparation for move from BH 17 to S34
10:20	11:30	01:10	Move Location	Move location to S34 / Jack up
11:30	12:15	00:45	MMO Watch	MMO Watch complete /
12:15	13:00	00:45	CP Drilling	Commence drilling operation on S34 / Drilling complete
13:00	13:15	00:15	Move Location	Commence move to S31 / Complete S31 Grab Sample
13:15	13:35	00:20	Move Location	Commence move to S33 / Complete S33 Grab Sample
13:35	15:40	02:05	Shipping delay	Awaiting Commercial divers to move out of location area to commence Grab / Divers away
15:40	16:05	00:25	Move Location	Commence move to S32 / Complete S32 Grab Sample
16:05	16:45	00:40	Move Location	Commence move to S43 / Complete S43 Grab Sample
16:45	17:35	00:50	Move Location	Commence move to S41 / Complete S41 Grab Sample
17:35	19:00	01:25	Move Location	Commence move to S39 / Fuel up and prepare for transit to shore / Winds building as per forecast
19:00	19:40	00:40	Shift Change	Dayshift Transit to shore / Nightshift transfer to JUB / MMO Watch commend / SOS Briefing: TBT
19:40	20:30	00:50	Move Location	Commence move to S39 / Complete S39 Grab Sample
20:30	21:50	01:20	Move Location	Commence move to S38 / Complete S38 Grab Sample
21:50	24:00	02:10	Down Time Tide	Awaiting Slack water in daylight hours to move to Northern Area of the Channel / **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue Grab Samples within the Bert 4 area / Potentially WOW due to high winds.

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

09 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.00	1.08
Move Location	7.25	20.92
CP Drilling	8.00	51.03
RC Drilling	0.00	6.58
Surface Sampling	0.00	0.00
Shift Change	1.08	10.08
Other Operations	2.33	7.58
Down Time Weather	0.00	18.67
Down Time Fugro	0.00	2.92
Down Time Client	0.00	0.00
Shipping delay	2.08	5.50
Jacking Operations	0.33	10.75
MMO Watch	0.75	7.30
MMO Downtime	0.00	8.42
Down Time Tide	2.17	30.67
TOTAL	**24.00**	**184.50**

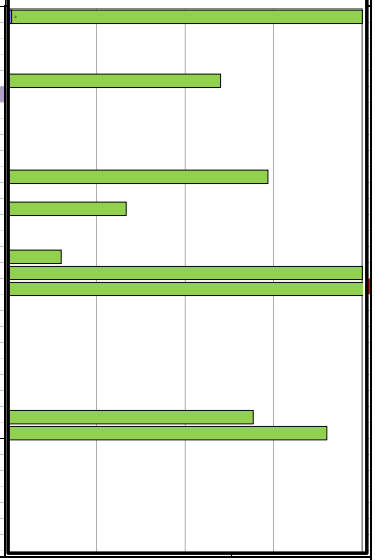
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lowthian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Thomas Cash	RE / RPS		
Total Personnel	11	Hours Worked	132

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	3	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5							30.00	0	0.00
Advance BH between 10m and 20m	B6							30.00	0	0.00
Advance BH between 20m and 30m	B7							4.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	8	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						4.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10			5.60			10.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3			3.30			3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30					0.00	22	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			7		0.00	18	0.00
Retrieval / storage of surface samples at depth			10			1		0.00	9	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	8
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	132	1020

Lost & Damaged

Fugro Representative Comments

Please note due to expected progression of works, FGSL stand to complete the works earlier than originally anticipated. Works are now likely to be completed by the end of next week.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

FUGRO / DUBLIN PORT Co / BYRNELOOBY	**Dublin Port SI 2 2018** **Aran 120A**	Daily Report No. **10 Rev0**

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Saturday 18-Aug-18
To	Matt Chappell	Email	m.chappell@fugro.com	cc amcloughlin@dublinport.ie	Email
cc	Glen Crisp	Email	c.crisp@fugro.com	cc chartford@dublinport.ie	Email
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc Joseph.McGrath@rpsgroup.com	Email
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc krooney@dublinport.ie	Email
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc MPeters@ByrneLooby.com	Email
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc clodagh.russell@iwdg.ie	Email
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc Ronan Hickey <ronan.hici@gmail.com>	Email
cc		Email		cc	Email

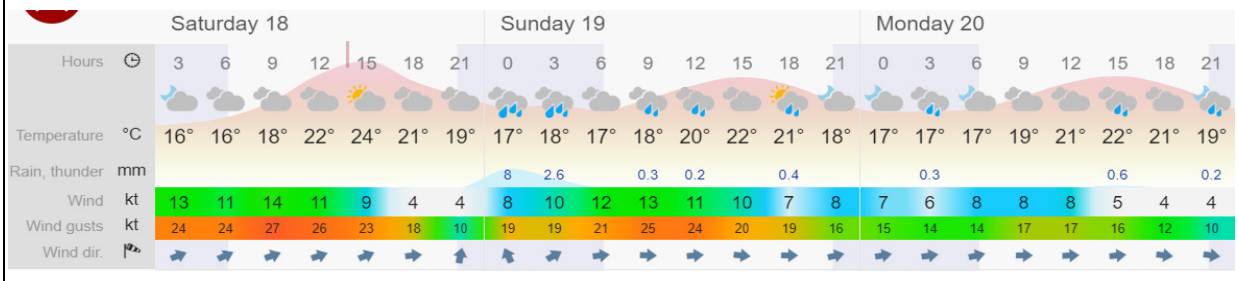
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	27	W	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	24	W	0.2	In Port	Good	
12:00	22	W	0.2	In Port	Good	
18:00	16	W	0.2	In Port	Good	
00:00	10	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-47	3.2	3.2	3.2	3.2	**WOW to move to next location / Complete S40, 42, 27, 18, 09, 08, 11 & Commence CP Drilling on BL-BH-47.**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / WOW Wind + 24Knts/s / Awaiitng suitble weather window to next location (S40)
07:15	07:40	00:25	Shift Change	Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
09:05	09:05	00:00	Down Time Weather	WOW Wind + 24Knts/s / Awaiitng suitble weather window to move area to North of the channel
09:05	09:20	00:15	Down Time Client	Request to VTS for Pilot boat to be removed to allow access to S40
09:20	09:40	00:20	Move Location	Move location to S40 / Complete S40 Grab Sample
09:40	10:50	01:10	Move Location	Move location to S42 / Complete S42 Grab Sample
10:50	12:20	01:30	Shipping delay	Waitng on VTS permission to move to new area North of channel
12:20	12:40	00:20	Move to new Area	Commence move to Area north of Dublin port Channel
12:40	12:50	00:10	Move Location	Complete S27 Grab Sample
12:50	13:15	00:25	Shipping delay	Commence move to S18 / Complete S18 Grab Sample
13:15	14:10	00:55	Move Location	Commence move to S09 / Complete S09 Grab Sample
14:10	14:50	00:40	Move Location	Commence move to S08 / Complete S08 Grab Sample
14:50	15:30	00:40	Move Location	Commence move to BL-BH-47
15:30	16:40	01:10	Jacking Operations	Commence jacking up in preperation for CP / RC drilling on BL-BH-47 / 16:30 MMO Watch commend
16:40	19:15	02:35	CP Drilling	Grab Sample 11 taken / 17:10 Commence CP drilling operations as MMO clerance / BH-47= 7.00m @ EOS
19:15	20:00	00:45	Shift Change	MMO Watch commenced / Dayshift Transit to shore / Nightshift transfer to JUB / SOS Briefing: TBT / MMO compelte
20:00	24:00	04:00	CP Drilling	Continue CP drilling operations / BH-47= 12.50m @ **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue CP and RC drilling on BL-BH-47.

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

10 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	0.00
Move to new Area	0.33	1.42
Move Location	3.92	24.83
CP Drilling	13.83	64.87
RC Drilling	0.00	6.58
Surface Sampling	0.00	0.00
Shift Change	1.17	11.25
Other Operations	0.00	7.58
Down Time Weather	1.42	20.08
Down Time Fugro	0.00	2.92
Down Time Client	0.25	0.25
Shipping delay	1.92	7.42
Jacking Operations	1.17	11.92
MMO Watch	0.00	7.30
MMO Downtime	0.00	8.42
Down Time Tide	0.00	30.67
TOTAL	**24.00**	**208.50**

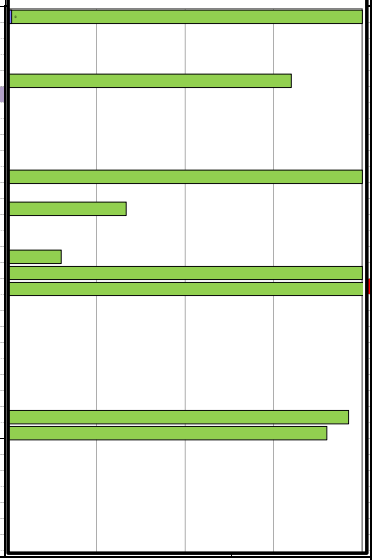
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lowthian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
	RE / RPS		
Total Personnel	10	Hours Worked	120

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	4	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				10.0			40.00	0	0.00
Advance BH between 10m and 20m	B6				2.50			32.50	0	0.00
Advance BH between 20m and 30m	B7							4.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15				2.0		3.00	12	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						0.00	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						4.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						10.00	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			8		0.00	41	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26			7		0.00	25	0.00
Retrieval / storage of surface samples at depth			10					0.00	9	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	9
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	120	1140

Lost & Damaged

Fugro Representative Comments

Please note due to expected progression of works, FGSL stand to complete the works earlier than originally anticipated. Works are now likely to be completed by the middle of next week.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

11 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Sunday 19-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

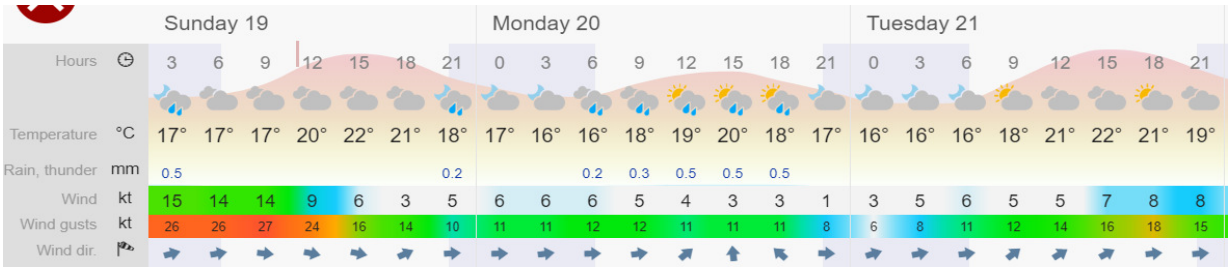
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	27	W	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	24	W	0.2	In Port	Good	
12:00	22	W	0.2	In Port	Good	
18:00	16	W	0.2	In Port	Good	
00:00	10	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-47	3.2	3.2	3.2	3.2	**Complete BH 47 / Commence CP on BH 41**
BL-BH-41	3.2	3.2	3.2	3.2	

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP Drilling operations on BH 47 / BH 47= 18.10m @ EOS.
07:15	07:50	00:35	Shift Change	Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
07:50	10:20	02:30	CP Drilling	Continue CP Drilling operations on BH 47 / CP Complete @ 22.60m / Change to Rotary
10:20	10:45	00:25	Other Operations	Change over to Rotary drilling operations
10:45	14:15	03:30	RC Drilling	Commence RC Drilling operations on BH47 / EOH confirmation @ 30.10m / **BH47 Complete**
14:15	15:15	01:00	Other Operations	Remove Geobore RC equipment in preparation for move to BL-BH-41
15:15	16:30	01:15	Jacking Operations	Jack down in preparation for move to BL-BH-41
16:30	17:30	01:00	Move to new Area	Move to position / Jacking up / MMO watch complete
17:30	19:20	01:50	CP Drilling	Commence CP drilling operations / BH 41 @ 7.45m
19:20	19:50	00:30	Shift Change	MMO Watch commenced / Dayshift Transit to shore / Nightshift transfer to JUB / **SOS Briefing:** TBT / MMO complete
19:50	24:00	04:10	RC Drilling	Continue RC drilling / **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue CP and RC drilling on BL-BH-41.

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

11 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	#REF!
Move to new Area	1.00	2.42
Move Location	0.00	24.83
CP Drilling	11.58	76.45
RC Drilling	7.67	14.25
Surface Sampling	0.00	0.00
Shift Change	1.08	12.33
Other Operations	1.42	9.00
Down Time Weather	0.00	20.08
Down Time Fugro	0.00	2.92
Down Time Client	0.00	0.25
Shipping delay	0.00	7.42
Jacking Operations	1.25	13.17
MMO Watch	0.00	7.30
MMO Downtime	0.00	8.42
Down Time Tide	0.00	30.67
TOTAL	**24.00**	**232.50**

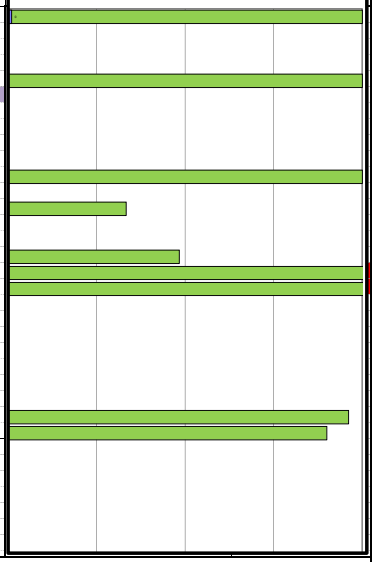
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lowthian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Greg Harkin	RE / RPS		
Total Personnel	11	Hours Worked	132

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	5	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5							40.00	0	0.00
Advance BH between 10m and 20m	B6				5.60			38.10	0	0.00
Advance BH between 20m and 30m	B7							4.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	12	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O			1.90			1.90	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30			10.00			14.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10			0.10			10.10	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			3		0.00	44	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	25	0.00
Retrieval / storage of surface samples at depth			10					0.00	9	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	10
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	132	1272

Lost & Damaged

Fugro Representative Comments

Please note due to expected progression of works, FGSL stand to complete the works earlier than originally anticipated. Works are now likely to be completed early this week.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

12 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Monday 20-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

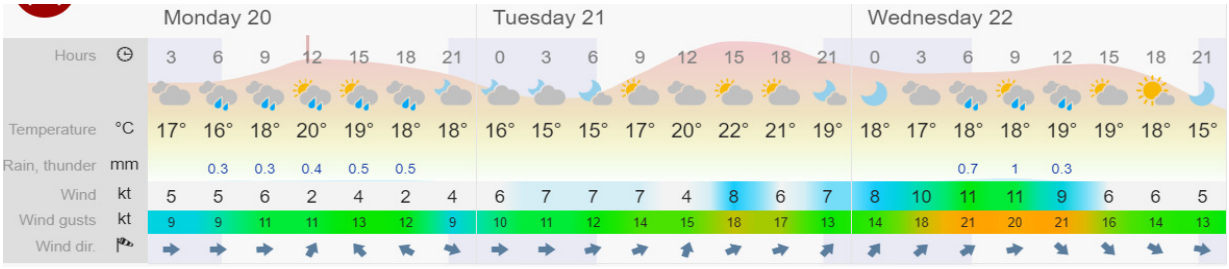
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	10	W	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	10	W	0.2	In Port	Good	
12:00	15	W	0.2	In Port	Good	
18:00	12	W	0.2	In Port	Good	
00:00	7	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-47	3.2	3.2	3.2	3.2	Complete BH 41, S21, S30 & commence BL-BH-78
BL-BH-77	3.2	3.2	3.2	3.2	

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP Drilling operations on BH 41 / BH 41= 18.10m @ EOS.
07:15	07:50	00:35	Shift Change	Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
07:50	08:20	00:30	RC Drilling	Continue RC Drilling operations on BH 41
08:20	09:20	01:00	Other Operations	Limited progress due to gravels
09:20	10:15	00:55	CP Drilling	Change back to CP as no advance made in gravels
10:15	13:15	03:00	RC Drilling	Continue coring operations / BL-BH-41 EOH 30.30m
13:15	15:30	02:15	Jacking Operations	Jack down in preparation for move S21
15:30	15:45	00:15	Move Location	MMO watch complete / Push legs in / Sample S21 / 8m Complete
15:45	16:20	00:35	Move Location	Move to S30
16:20	17:30	01:10	Move Location	Move to BL-BH-78
17:30	19:00	01:30	Jacking Operations	Jacking operation on BH 78 / Fuel up and prepare for drilling operations
19:00	19:40	00:40	Shift Change	MMO Watch commenced / Dayshift Transit to shore / Nightshift transfer to JUB / SOS Briefing: TBT / MMO complete
19:40	24:00	04:20	CP Drilling	Commence CP drilling operations on BL-BH-78 =7.0m / **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue CP and RC drilling on BL-BH-41.

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

12 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	#REF!
Move to new Area	0.00	2.42
Move Location	2.00	26.83
CP Drilling	12.50	88.95
RC Drilling	3.50	17.75
Surface Sampling	0.00	0.00
Shift Change	1.25	13.58
Other Operations	1.00	10.00
Down Time Weather	0.00	20.08
Down Time Fugro	0.00	2.92
Down Time Client	0.00	0.25
Shipping delay	0.00	7.42
Jacking Operations	3.75	16.92
MMO Watch	0.00	7.30
MMO Downtime	0.00	8.42
Down Time Tide	0.00	30.67
TOTAL	**24.00**	**256.50**

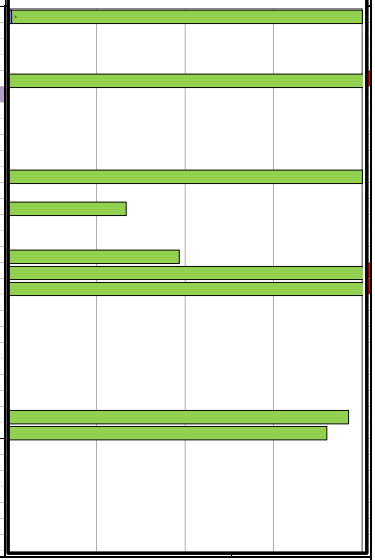
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lowthian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
Greg Harkin	RE / RPS		
Total Personnel	11	Hours Worked	132

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	6	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				7.0			47.00	0	0.00
Advance BH between 10m and 20m	B6							38.10	0	0.00
Advance BH between 20m and 30m	B7							4.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15						3.00	12	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						1.90	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						14.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						10.10	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			6		0.00	50	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	25	0.00
Retrieval / storage of surface samples at depth			10					0.00	9	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	11
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	132	1404

Lost & Damaged

Fugro Representative Comments

Please note due to expected progression of works, FGSL stand to complete the works earlier than originally anticipated. Works are now likely to be completed early this week. BL-BH-78 Additional.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

13 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Tuesday 21-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

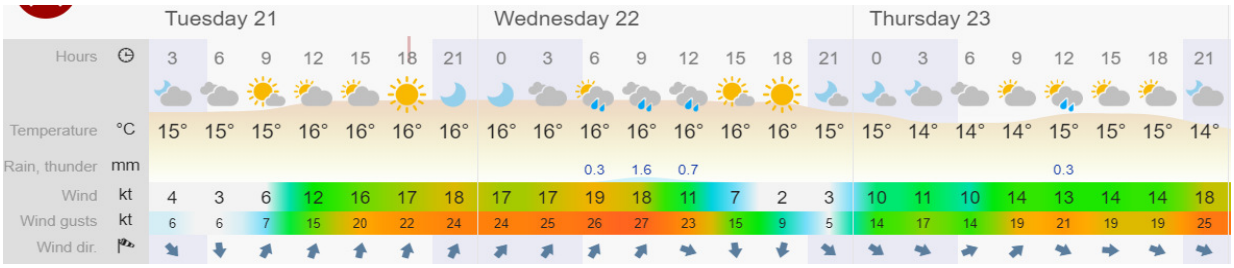
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	3	SW	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	8	SW	0.2	In Port	Good	
12:00	14	SW	0.2	In Port	Good	
18:00	16	SW	0.2	In Port	Good	
00:00	18	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-78	3.2	3.2	3.2	3.2	**Complete BL-BH-78 / Move to and commence BL-BH-77**
BL-BH-77	3.2	3.2	3.2	3.2	

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP Drilling operations on BH 78 / BH 78= 17.5m @ EOS.
07:15	07:50	00:35	Shift Change	Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
07:50	17:40	09:50	RC Drilling	Continue RC Drilling operations on BH78 / Difficult drilling return to CP / BL-BH-78 @ 30.00m **EOH**
17:40	18:10	00:30	Jacking Operations	Jack down in preparation for move the next BH location
18:10	18:30	00:20	Move Location	Move to BL-BH-78
18:30	19:05	00:35	Jacking Operations	Continue coring operations / Jacking operation on BH 78 / Fuel up and prepare for drilling operations
19:05	19:50	00:45	Shift Change	Dayshift Transit to shore / Nightshift transfer to JUB / SOS Briefing: TBT
19:50	20:00	00:10	MMO Watch	MMO Watch commenced / MMO complete
20:00	24:00	04:00	CP Drilling	Commence CP drilling operations on BL-BH-78 =6.5m @ **End of Reporting period**

Weather Forecast



Work planned - next 24hrs:

Continue CP and RC drilling on BL-BH-78. Move to Addition BH location (BL-BH-77)

Health Safety & the Environment

TBT, HSE Audit on board with HSE Manager Steve Dadd. Items identified and will be rectified in due course.

Fugro GeoServices: Colin Mulvey	Client Rep:
Signed	Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

13 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	#REF!
Move to new Area	0.00	2.42
Move Location	0.33	27.17
CP Drilling	11.25	100.20
RC Drilling	9.83	27.58
Surface Sampling	0.00	0.00
Shift Change	1.33	14.92
Other Operations	0.00	10.00
Down Time Weather	0.00	20.08
Down Time Fugro	0.00	2.92
Down Time Client	0.00	0.25
Shipping delay	0.00	7.42
Jacking Operations	1.08	18.00
MMO Watch	0.17	7.47
MMO Downtime	0.00	8.42
Down Time Tide	0.00	30.67
TOTAL	**24.00**	**280.50**

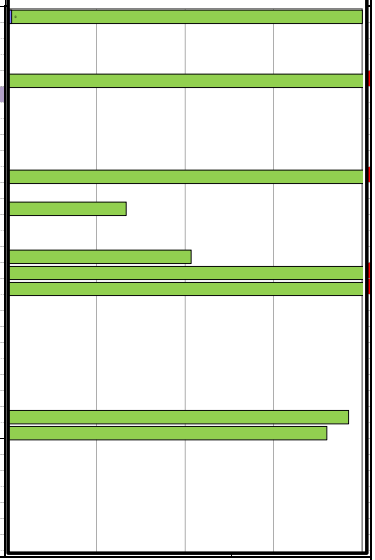
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lothian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
James Martin	RE / RPS		
Steve Dadd	HSE Fugro		
Total Personnel	12	Hours Worked	144

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5			1		0.00	7	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5				9.5			56.50	0	0.00
Advance BH between 10m and 20m	B6				10.00			48.10	0	0.00
Advance BH between 20m and 30m	B7				10.0			14.00	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15				1.0		3.00	13	0.00
Rotary Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O			1.00			2.90	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30			1.00			15.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						10.10	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30			7		0.00	57	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	25	0.00
Retrieval / storage of surface samples at depth			10					0.00	9	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	12
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	144	1548

Lost & Damaged

Fugro Representative Comments

Please note due to expected progression of works, FGSL stand to complete the works earlier than originally anticipated. Works are now likely to be completed early this week.

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

14 Rev0

Job No	DPC No: CP1770_MP2 / FGSL No:C1791 J6701	Vessel	Aran 120A	Date	Wednesday 22-Aug-18

To	Matt Chappell	Email	m.chappell@fugro.com	cc	amcloughlin@dublinport.ie	Email	
cc	Glen Crisp	Email	c.crisp@fugro.com	cc	chartford@dublinport.ie	Email	
cc	Sarah Horgan	Email	shorgan@dublinport.ie	cc	Joseph.McGrath@rpsgroup.com	Email	
cc	Fergus Britton	Email	fbritton@dublinport.ie	cc	krooney@dublinport.ie	Email	
cc	Michael McKenna	Email	mmckenna@dublinport.ie	cc	MPeters@ByrneLooby.com	Email	
cc	Tristan Murphy	Email	tmurphy@dublinport.ie	cc	clodagh.russell@iwdg.ie	Email	
cc	Karen McLoughlin	Email	kmcloughlin@dublinport.ie	cc	Ronan Hickey <ronan.hici@gmail.com>	Email	
cc		Email		cc		Email	

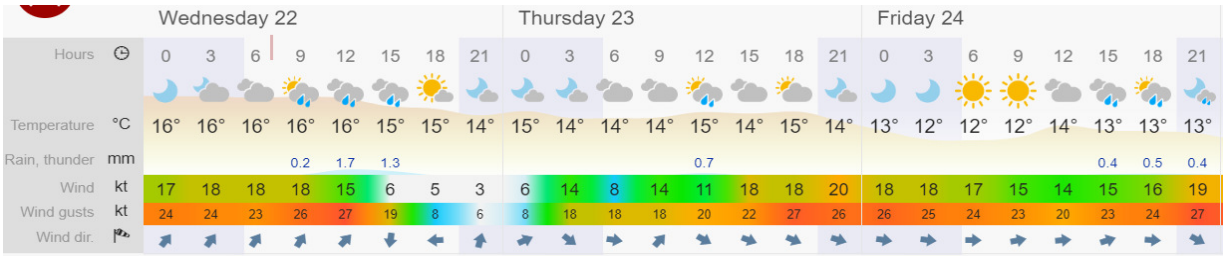
Observed Weather	Wind		Swell (Hs)	Sea State	Visibility	Weather Forecast
Time 00:00	Speed Knts	Dir				
00:00	15	W	N/A	In Port	Good	Weather forecast indicates potential for high winds weather for planned works. Some potential for Gust above limits for movements but only expected to cause minimal delays
06:00	10	W	0.2	In Port	Good	
12:00	10	W	0.2	In Port	Good	
18:00	16	W	0.2	In Port	Good	
00:00	10	W	0.2	In Port	Good	

Leg Penetration (m)					Operational Status
Location	Leg 1	Leg 2	Leg 3	Leg 4	
BL-BH-77	3.2	3.2	3.2	3.2	**Complete BL-BH-77 / Waiting on Tide to tow to berth 18**

Summary of Borehole Drilling and Sampling Operations - last 24hrs:

From	To	Hrs	Code	Description
00:00	07:15	07:15	CP Drilling	**Start of Reporting Period** / Continue CP Drilling operations on BH 77 / BH 77= 17.5m @ EOS.
07:15	07:50	00:35	Shift Change	Dayshift transfer to JUB / MMO Watch commend / **SOS Briefing: TBT**
07:50	14:30	06:40	RC Drilling	Continue RC Drilling operations on BH77 / BH Complete @ 30.40m **EOH**
14:30	15:10	00:40	Other Operations	Remove casing from BH77 / Prespring deck and items for transit.
15:10	18:00	02:50	Down Time Tide	Waiting tide to rise to allow crew to disembark to shoreside
18:00	18:30	00:30	Shift Change	Dayshift transfer to shoreside / Nightshift have now been disbanded and will in dayshift tomorrow for 1 day.
18:30	24:00	05:30	Down Time Tide	WOW Tide, HW required to move off BH 77 location and tow to Berth 18 as designated by Port Harbour Master.
				Site Works and 2 additional BH (77 & 78) Complete and demob will commence once the Aran 120A reaches Berth 18

Weather Forecast



Work planned - next 24hrs:

Waiting on tide to tow to berth 18. Expected ETA 10:00 on the 23/08/18

Health Safety & the Environment

TBT,

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed

Dublin Port SI 2 2018
Aran 120A

Daily Report No.

14 Rev0

Activity Time Summary

Summary of Borehole Drilling & Sampling Operations	Today's Totals	Actual to Date
Mobilisation	0.00	#REF!
Move to new Area	0.00	2.42
Move Location	0.00	27.17
CP Drilling	7.25	107.45
RC Drilling	6.67	34.25
Surface Sampling	0.00	0.00
Shift Change	1.08	16.00
Other Operations	0.67	10.67
Down Time Weather	0.00	20.08
Down Time Fugro	0.00	2.92
Down Time Client	0.00	0.25
Shipping delay	0.00	7.42
Jacking Operations	0.00	18.00
MMO Watch	0.00	7.47
MMO Downtime	0.00	8.42
Down Time Tide	8.33	39.00
TOTAL	**24.00**	**304.50**

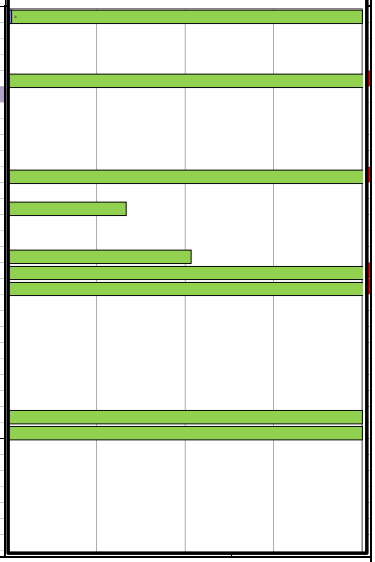
Personnel on Board (Fugro/Client/Subcontractors)

Day Shift	Company/Position	Night Shift	Company/Position
Steve Trewin	Fugro / Barge Master	Wayne Gunn	Fugro / Bargemaster
Carl Redpath	Fugro / Driller	Josh Sandy	Fugro / Bargemaster / Driller
Jake Warner	Fugro / AD	James Smith	Fugro /AD
Ashley Lowthian	Fugro / AD		
Colin Mulvey	Fugro / PM		
Adam Barnard	Fugro / Geotech	William Lowry	Fugro / Geotech
James Martin	RE / RPS		
Total Personnel	11	Hours Worked	132

Project Program / Progress

Activity	Bill Item	Programmed m.	Programmed No.	Programmed Hrs	Today m.	Today No.	Today Hours	Actual To Date m.	Actual To Date No.	Actual To Date Hours
Mobilisation of ARAN120A	A2a		1					0.00	1	0.00
Demobilisation of ARAN120A	A2a		1					0.00	0	0.00
								0.00	0	0.00
CP Drilling	**Item No.**							0.00	0	0.00
Set up all associated plant and equipment	B1		5					0.00	7	0.00
Break out surface obstructions where present	B3			R/O				0.00	0	2.20
Advance BH between ground level and 10m depth	B5							56.50	0	0.00
Advance BH between 10m and 20m	B6				2.50			50.60	0	0.00
Advance BH between 20m and 30m	B7				10.4			24.40	0	0.00
Advance BH through hard stratum or obstruction	B8			R/O				0.00	0	0.00
UT100 Sample taken	???	15				3.0		0.00	23	0.00
Rotary Drilling	**Item No.**							0.00	1	0.00
Set up all associated plant and equipment	C1		3					0.00	1	0.00
Geobore S drill between ground level and 10m depth	C11	R/O						0.00	0	0.00
Geobore S drill between 10m and 20m depth	C12	R/O						2.90	0	0.00
Geobore S drill between 20m and 30m depth	C13a	30						15.50	0	0.00
Geobore S drill between 30m and 40m depth	C13b	10						10.10	0	0.00
Geobore S drill between 40m and 50m depth	C13c	3						3.30	0	0.00
Extra over items for use of semi-rigid liner	C14	43						0.00	0	0.00
Core box to be retained by client	C22		29					0.00	0	0.00
								0.00	0	0.00
Insitu Testing	**Item No.**							0.00	0	0.00
Standard penetration test in CP / RC borehole	F2		30					0.00	62	0.00
								0.00	0	0.00
2018 Env BoQ	**Item No.**							0.00	0	0.00
Retrieval / storage of surface samples at seabed			26					0.00	26	0.00
Retrieval / storage of surface samples at depth			10					0.00	10	0.00

% Program Completed



Health & Safety Summary	Today	Actual To Date
Hoc Cards	0	0
Safety Drills	1	1
Tool Box Talks	1	13
HSE Meetings	1	1
Incidents/Near Miss	0	0
Environmental	0	0
Hours Worked	132	1680

Lost & Damaged

Fugro Representative Comments

After BH-BL-77 FGSL will have complete the works outlined by DPC and an additional 2 no 30m BH (BH 77 & 78)

Client Representative Comments

Fugro GeoServices: Colin Mulvey

Signed

Client Rep:

Signed:

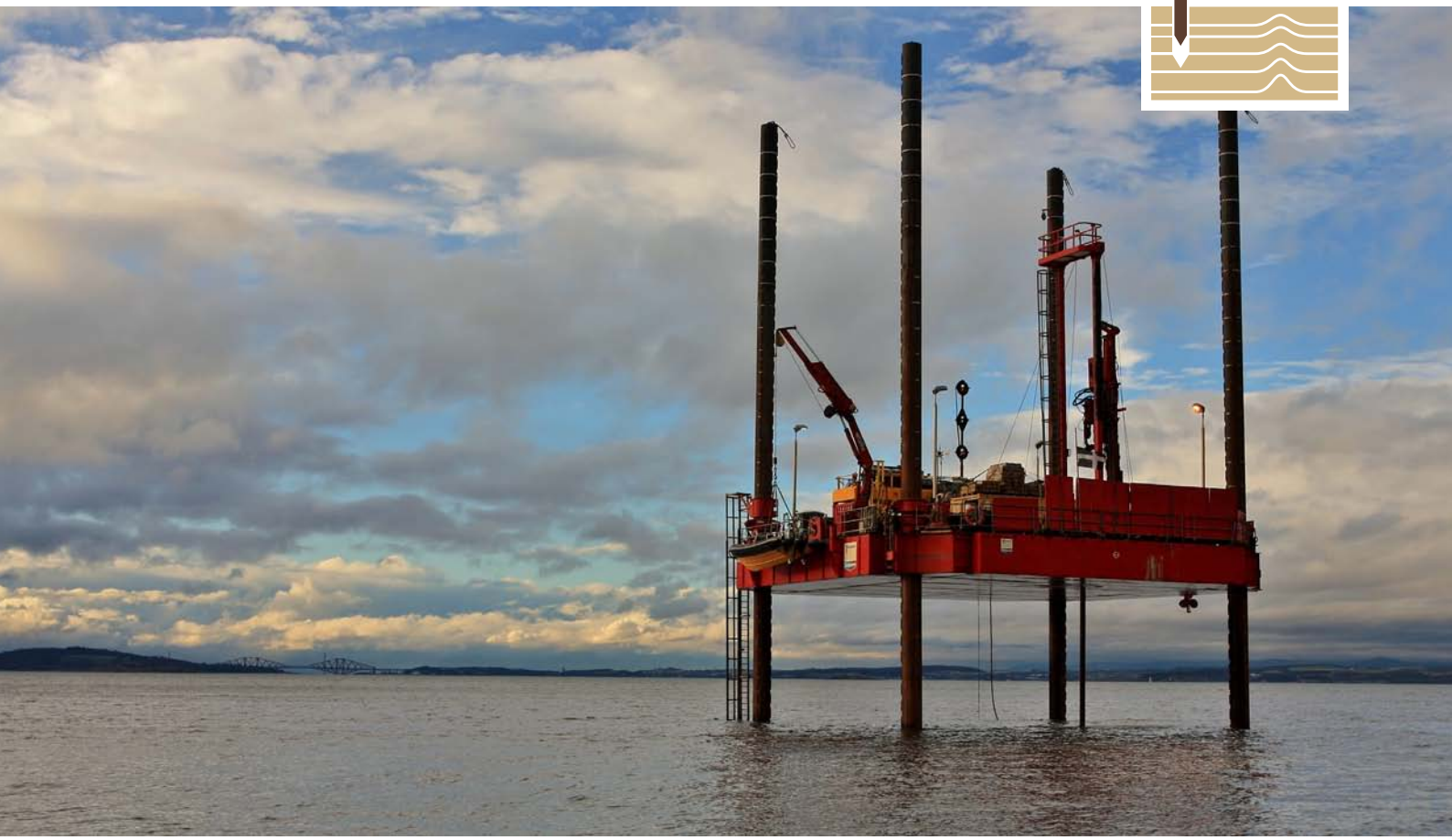
G. VESSEL AND PLANT DATA SHEETS

Aran 120A

Comacchio MC1200

Terracore S-Geobor

Dual Van Veen Grab Sampler



FUGRO
ARAN 120

The Aran 120 is a medium sized, high payload, container transportable, modular jack-up platform. The jack-up has low international transport costs coupled with high performance capabilities.

The jack-up's modular design allows the Aran 120 to provide a cost-effective solution to perform a wide variety of functions from geotechnical investigations to excavation and construction.

With a large deck area of 324 m^2 the Aran 120 can cater for a wide application of drilling and specialist in situ sampling & testing.

The Aran 120 has a rapid deck elevating system and is equipped with four legs mounted externally to provide maximum strength and stability.

Assembly and commissioning of the jack-up superstructure is achieved in 2-3 days, allowing a rapid mobilisation of the required plant, equipment and ancillaries.

The jack-up can be fitted with one of Fugro's hydraulic thrusters to provide self-propulsion and to aid in the final positioning of the jack-up.

In a compact configuration, this fast elevating jack-up is ideal for confined intertidal areas, where swift, accurate moving and positioning is required.

In a larger configuration, the Aran 120 jack-up platform is capable of working safely and productively in exposed open waters and high tidal ranges.

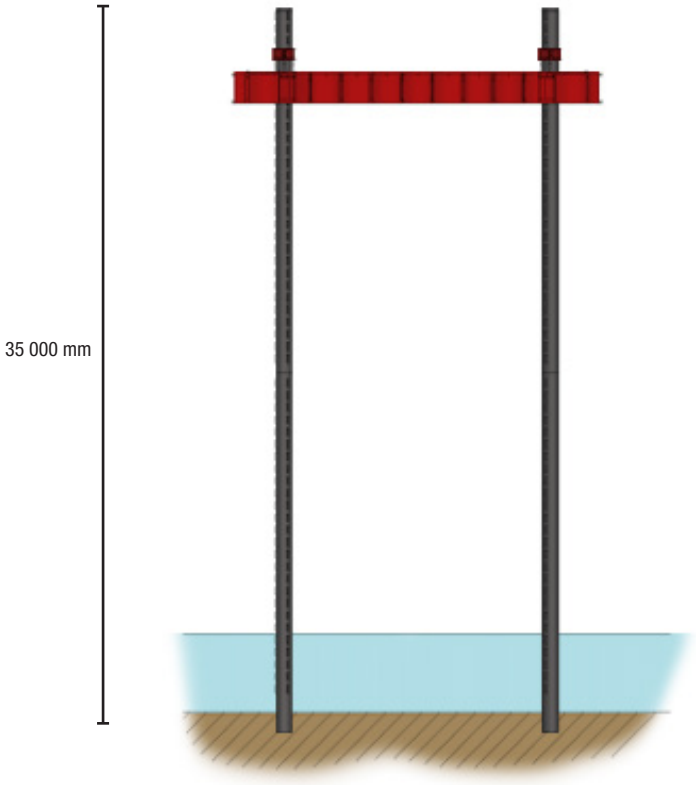
For maximum safety, the jack-up is equipped with rigid steel bulwarks and 110 V fluorescent lights, providing full inboard and outboard illumination for the continuation of safe working conditions over a 24 hour working period.

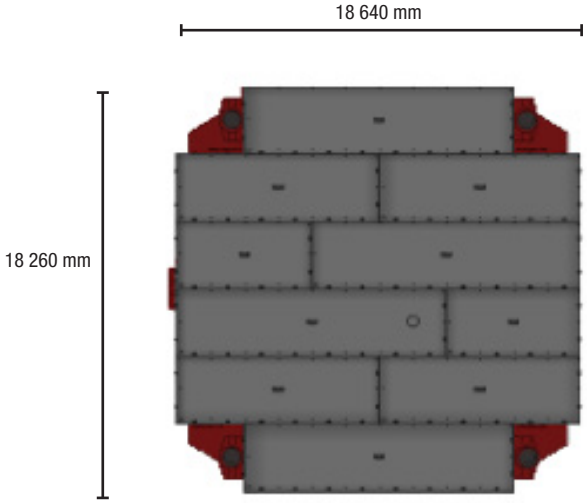
Operated and maintained exclusively by Fugro's trained and experienced marine crew, the Aran 120 jack-up is a versatile, stable, self-elevating platform which provides a cost-effective solution for overwater work.

SPECIFICATIONS

Aran 120 Jack Up Barge

Classification society:	Germanischer Lloyd
Max. separation:	32 m (subject to environmental conditions at location)
Draught:	1.52 m
Max. payload:	120 t (dependent on spud length)
Max. deck load:	15 t / m²
Jacking system:	Twin hydraulic ram and locking ring
Length:	18.3 m
Beam:	18.3 m
Number of legs:	4
Max. leg length:	35 m
Leg dia.:	0.76 m





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FUGRO
COMACCHIO MC1200

The MC1200 is a hydraulic skid mounted drilling rig capable of operating all rotary and/or rotary percussive drilling systems.

During the design stage, Fugro worked closely with Comacchio to ensure the development of a fully integrated drilling unit capable of withstanding both the complex and rigorous nature of marine works. For example, the MC1200 has a unique triple holding clamp and breakout arrangement for handling the various casings required. These are complimented by a set of hydraulically adjusted drill string centralisers.

The main mast is equipped with a crane boom and a drill string manipulator arm that enables drill rods and casings to be manoeuvred to and from the working deck with minimal manual intervention.

The main power supply is fully silenced and the hydraulics operate a closed system with biodegradable oil.

The control console is deployed on a multipositional arm, providing the driller with an uninterrupted view of all drilling activities. All rotating parts are guarded within a fully interlocked cage.

The MC1200 is suitable for all aspects of rotary soil investigations, core drilling as well as specialised civil engineering works such as micropiles, anchors and ground consolidation works.

MC1200 deck layout on Excalibur jack-up.

SPECIFICATIONS

MC1200 Marine Drill

Power Pack

Diesel engine:	New generation 132 kW DEUTZ diesel engine series 2012
Engine power:	132 kW (180 HP)/2300 rpm
Main pump:	2 x 190 lt/min./2 x 50, 2 gal/min.
Oil tank:	400 lt / 105.6 gal
Fuel tank:	350 lt / 92.5 gal

Mast

Feed stroke:	4750/7200/10 200 mm
Total length:	7100/9550/12 550 mm/ 23,3/31,3/41,2 ft
Feed force:	7000 daN/ 15 736 lbs
Retract force:	7000 daN/ 15 736 lbs

Clamps

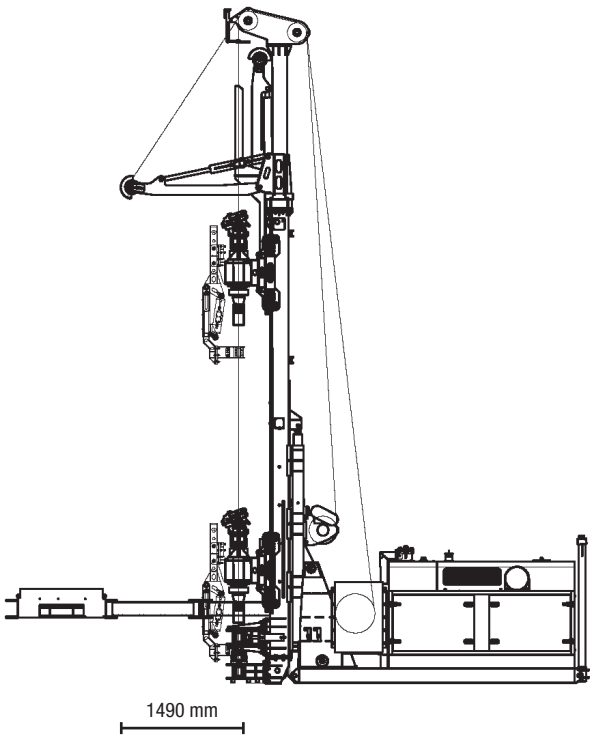
Min. handling:	45 mm / 1,8”
Max. handling:	360 mm /14.1”
Clamping force:	280 kN / 62 946 lbs
Breaking torque:	3500 daNm / 25 814 lb ft

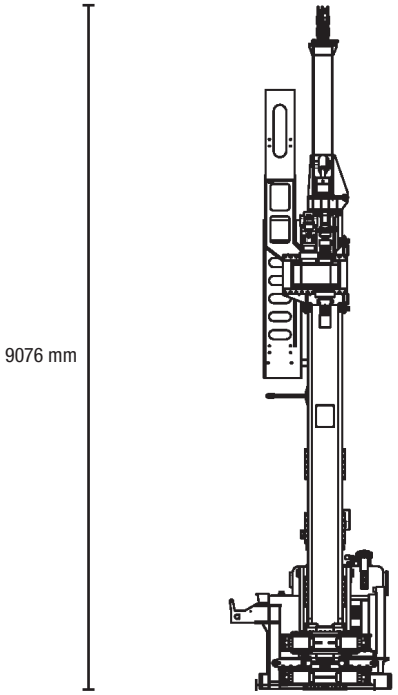
Rotary Head

Gears:	6
Max torque:	1230 daNm/ 9072 lb ft
Max speed:	340 (550) rpm
Head passage:	93 mm/3,6”
Swivel passage:	2”

Winch

Max line pull:	2000 daN/4496 lbs
Drum capacity:	50 mt/164 ft
Rope speed:	30 mt/min./98 ft/min
Rope diameter:	10 mm/0.39”





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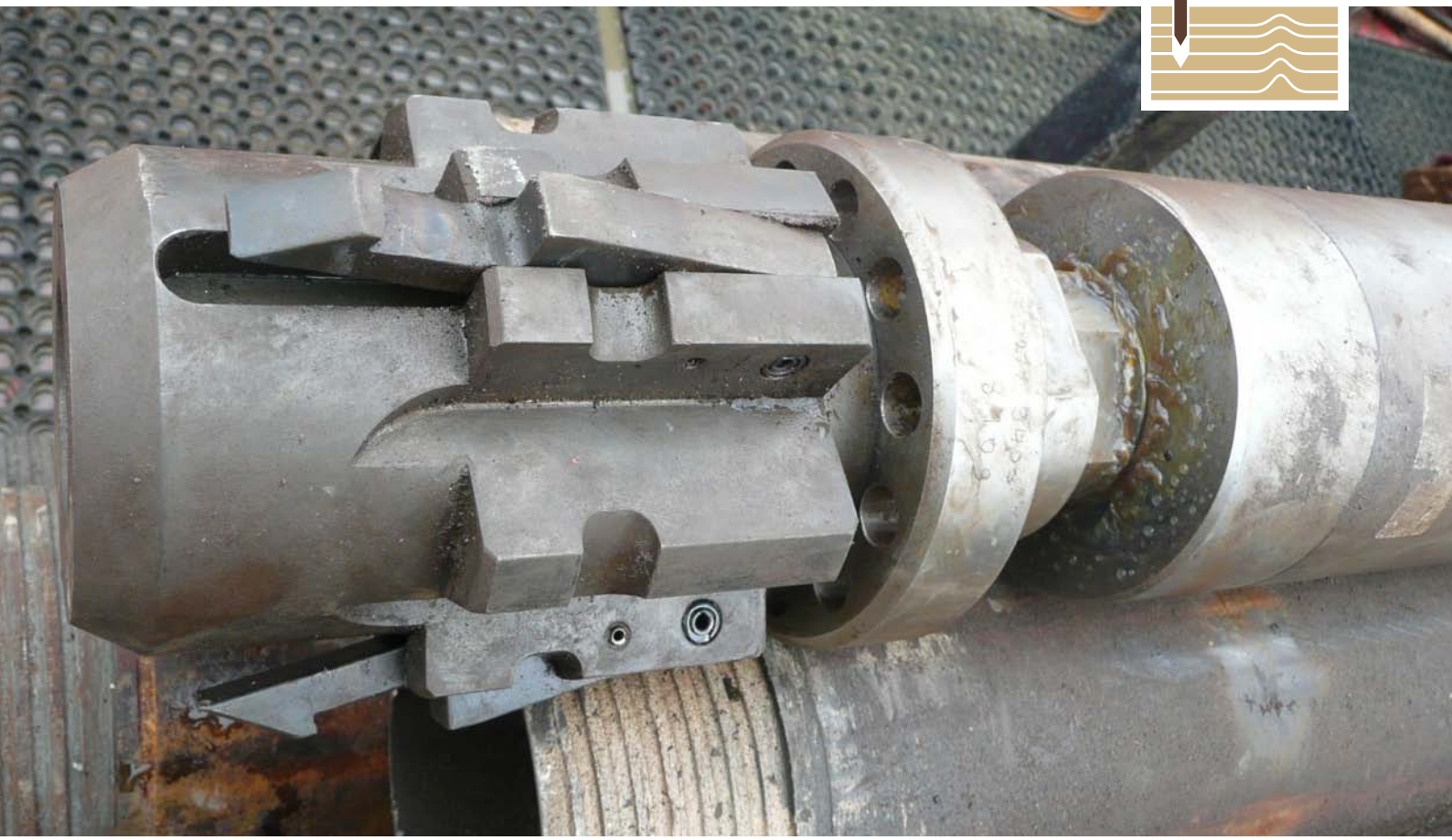
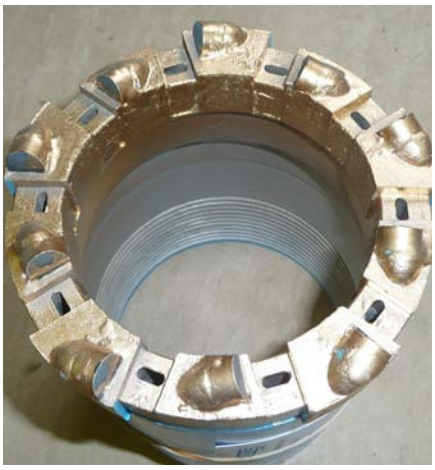


FUGRO
GEOBOR-S

With 40 years of drilling experience, Fugro has examined and tested many methods of coring - aiming to minimise core disturbance and maximise core recovery and quality.



GEOBOR-S SYSTEM

Our experience leads us to recommend the use of Geobor-S triple tube wireline drilling system, which has been specially developed for core drilling and undisturbed sampling in a wide variety of soil and rock formations. The Geobor-S is a triple tube core barrel which cuts an “S” size core sample. It has a plastic core liner, which is seated within the inner barrel assembly, considerably reducing friction between the core and the inner tube and enhancing core recovery.

SAMPLE RECOVERY

A nominal 102 mm diameter core sample is recovered from this system, generally in 1.5 m lengths.

The relatively large diameter enhances drilling performance whilst obtaining high-quality core samples, for soil and rock testing.

We provide a wide range of coring bits including but not limited to:

- annular and face discharge,
- surface set and impregnated diamond,
- tungsten carbide saw tooth,
- PCD (polycrystalline diamond).

The core barrel itself is designed for flushing with water, mud or air, and can easily be adapted for most soil and rock conditions by the use of an appropriate core bit or non-coring device.

CORE LINER

The core liner is a rigid, transparent PVC tube with a wall thickness of approximately 1 mm that fits snugly inside the Geobor-S core barrel inner tube, trimmed to 1.5 m lengths. This is provided for all coring works.

The core samples are recovered within the core liner tube and removed from the inner barrel between each consecutive run. The sample can be retained within the core liner tube sealed at both ends and placed into the core box. This minimises handling induced core disturbance, both on the drill deck and during subsequent transport of the core sample to the onshore core store and testing laboratories.

From our experience, the combination of the Geobor-S system used with core liners:

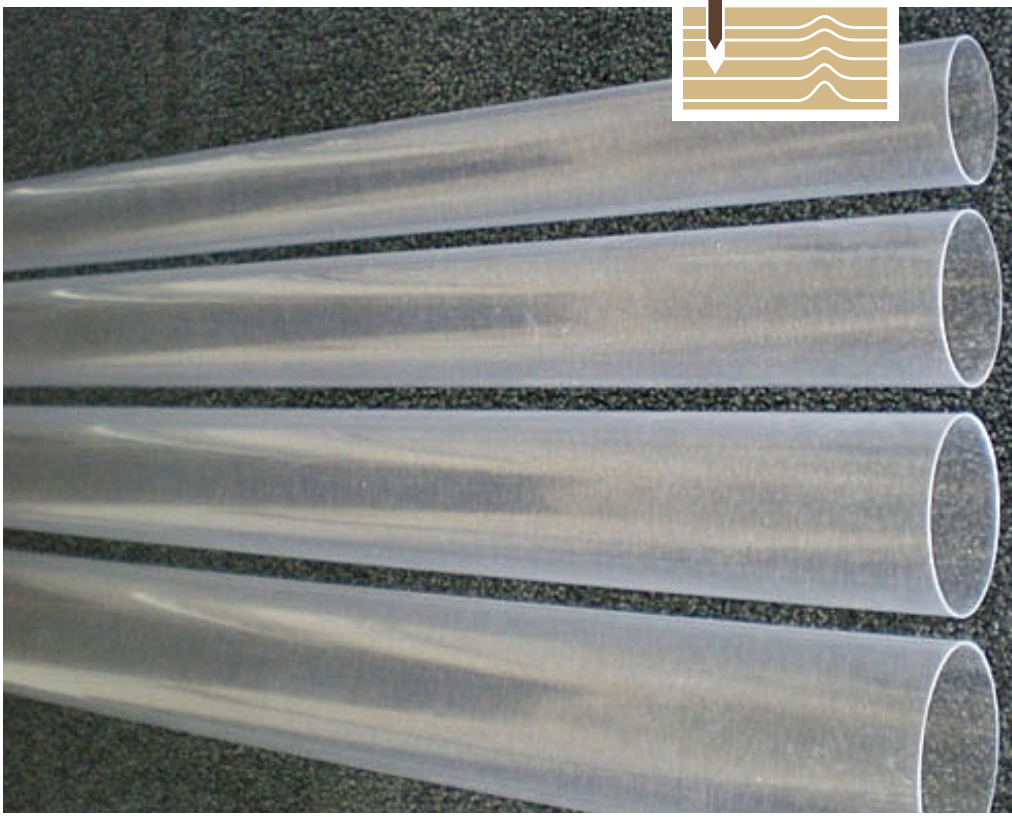
- reduces coring and transport induced disturbance,
- maintains sample quality,
- significantly enhances recovery especially in mixed formations.

Furthermore, we monitor the effectiveness of the various bit types throughout drilling, selecting bits appropriate to varying ground conditions as each borehole progresses. This allows us to maximise core quality and recovery in an appropriate and cost effective manner.

Four methods can be used to suit varying ground conditions:

1. In medium to hard formations, many types of core bits can be used depending on the formation.

2. For coring in soft soil formations, TC-set bits are used and the bit consists of two parts (pilot and reamer).



Geobor-S Core Liner.

Technical Specifications	Metric	Imperial
Hole diameter, method 1 & 4:	146.0 mm	5.75 in
Hole diameter, method 2 & 3:	150.0 mm	5.90 in
Drill bit outer diameter:	145.6 / 149.6 mm	5.73 / 5.90 in
Drill rod outer diameter:	139.7 mm	5.58 in
Bit kerf, method 1:	21.8 mm	0.86 in
Bit kerf, method 2 & 3:	23.8 mm	0.94 in
Core diameter:	102.0 mm	4.05 in
Hole area (od 146/150):	167.3 / 176.7 cm²	26.0 / 27.4 in²
Core area:	81.7 cm²	12.7 in²
Cutting area in % of hole area:	51.7 %	51.7 %

3. For coring in very soft or loose formations, TC-set bits are used. The bit is in two parts as in method two but one core lifter is extended to run 25 mm in front of the bit.

4. For coring in very soft, loose formations with varying layers. The spring-loaded inner tube assembly is extended to run in front of the bit, but is retractable for optimised adaptation to the consistency and density of the ground.

OTHER ADVANTAGES

The advantages of wireline coring over conventional coring (using drill rods and core barrels) include:

- Separate temporary lining casing for borehole stabilisation may not be required.
- The drill string is more rigid.
- The core barrel may be recovered without removing the outer drill rod, thus reducing disturbance to the borehole wall.
- The small annulus between the drill pipe and borehole wall requires significantly lower volumes of flush fluid compared to conventional drilling to achieve adequate uphole velocity for removal of cuttings from the hole. As a consequence, erosion of the formation (particulary at the bit face) is reduced.

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FUGRO
DUAL VAN VEEN GRAB (0.1m^2)

The Dual Van Veen Grab (0.1 m2) is designed to obtain two quantitative sediment samples from a single deployment. The grab is designed for sampling fine to medium coarse grained sediments in water depths up to 1500 m.

The Dual Van Veen grab is an upgrade of the standard Van Veen grab. The ability to acquire multiple samples from a single deployment has led to a marked increase in survey efficiency as it reduces the time spent deploying and recovering the survey equipment. The Dual Van Veen grab is not significantly larger or heavier than the standard Day grab and so has a similar weather tolerance.

Made from stainless steel, the Dual Van Veen grab has the capacity to carry additional lead weights (up to 150 kg) to increase sampling tolerances in areas where sediments may be more compacted, or in strong currents.

SAMPLING

The samples acquired from the Dual Van Veen grab are processed for either macrofauna or sediment chemistry analysis depending on the project specifications. Each sampling bucket has the capacity to collect a 0.1 m2 area of sea bed and approximately 12 L of sediment. Hinged doors on the top of both buckets allow access to the relatively undisturbed sediment surface before the grab is emptied.

The grab sampler is currently used on the majority of environmental surveys in the Middle East and on Fugro vessels in the North Sea.

Recovering the 0.1m2 Dual Van Veen grab.

DUAL VAN VEEN GRAB (0.1m^2)

Technical Specifications

Physical Parameters

Dimensions	1.1 m (l) x 0.9 m (w) x 1.0 m (h)
Weight	50 kg
Additional Ballast	150 kg (lead ingots)
Required Clearance	2.5 m

Sampling Details

Sample Area	2 x 0.1 m^2
Sample Volume	2 x 12 L
Depth Capacity	Up to 1 500 m (dependent on cable length and cable type)
Sediment Type	Fine to medium coarse sediments