Hornsea Project Four

Clarification Note on Marine Sediment Contaminants (tracked)

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Acronyms

Term	Definition
CAL1	Cefas Action Level 1
CAL2	Cefas Action Level 2
DCO	Development Consent Order
ECC	Export cable corridor
EIA	Environmental Impact Assessment
EQSs	Environmental Quality Standards
ERL	Effective range low
ERM	Effective range median
ES	Environmental Statement
HMW	Heavy molecular weight
ISQG	Interim Sediment Quality Guidelines
LMW	Low molecular weight
MarSEA	Marine Evidence based Sensitivity Assessment
MMO	Marine Management Organisation
PAH	Polyaromatic hydrocarbons
PCB	Polychlorinated byphenyls
PEL	Probable Effect Levels
PINS	The Planning Inspectorate
TEL	Threshold Effect Levels
TBT	Tributyltin

1 Introduction

1.1 Aim of this clarification note

1.1.1.1 Orsted Hornsea Project Four Limited (hereafter the Applicant) has submitted a Development Consent Order (DCO) application to the Planning Inspectorate (PINS), supported by a range of plans and documents including an Environmental Statement (ES) which set out the results of the Environmental Impact Assessment (EIA) on the Hornsea Project Four Offshore Wind Farm (hereafter Hornsea Four) and its associated infrastructure.

1.1.1.2 This clarification note has been prepared to provide a detailed response to the Relevant Representations made by the Marine Management Organisation (MMO) (RR-020) and Natural England (RR-029). This clarification note has been updated further to provide additional assurance for issues raised by representations during the examination process. This note aims to provide sufficient information to provide confidence for these parties that the potential for the release of contaminants in the marine environment has been adequately considered in the Applicant's DCO Application.

1.1.1.3 This note has sought to collate information from the following DCO Application documents:

- **Volume A2, Chapter 2: Benthic and Intertidal Ecology (APP-014)**;
- **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**;
- **Volume A2, Chapter 1: Marine Geology, Oceanography and Physical Processes (APP-013)**;
- **Volume A4, Annex 4.4: Dredging and Disposal (Site Characterisation) (APP-042)**; and
- **Volume A5, Annex 2.2: Water Framework Directive Assessment (APP-069)**.

1.1.1.4 The collated information is intended to provide the MMO and Natural England with sufficient information to provide comfort that sediment bound contaminants are not a matter for concern in relation to the construction, operation and decommissioning of Hornsea Four.

1.1.1.5 Appendix A to this clarification note provides the Certificates of Analysis for polycyclic aromatic hydrocarbons (PAHs) for the array, and Appendix B to this note provides the requested Certificates of Analysis for PAHs for the export cable corridor (ECC). Appendix C provides further assessment of the probable effects of the PAH concentrations within the ECC on biota.

1.2 Key points raised

1.2.1.1 **Table 1** provides the key Relevant Representations made in relation to the potential impacts arising from sediment bound contaminants. **Table 2** provides the key submissions made during the examination process, to date, in relation to contaminated sediments in the marine environment.

Table 1: Relevant Representations with regards to sediment contamination.

Interest Party	Relevant Representation	Section in this note where the concerns are addressed
MMO	**3.3.4:** The dredge and disposal site characterisation report correctly highlights that dredging may lead to sediment plumes, which could create indirect effects on other receptors as a result of increased suspended sediment concentration, deposition and potential release of contaminants (noting these will be discussed in the relevant chapters for individual receptors). The report also highlights that the material to be dredged is predominantly coarse sand, and therefore the likelihood of persistent plumes is low. The MMO believes that this is an accurate conclusion.	This is welcomed by the Applicant and is not addressed further in this clarification note but has been included for completeness.
MMO	**3.3.8:** The ES concludes that potential impacts related to dredging and disposal operations are negligible. The MMO agrees with this conclusion, based on the information provided, which suggests that material is likely to be comprised mostly of coarse sand with low levels of observed contamination.	This is welcomed by the Applicant and is not addressed further in this clarification note but has been included for completeness.
MMO	**3.4.25:** The MMO previously raised the potential issue of obtaining contaminant samples from a Hamon grab as this gear mixes the sediment. The MMO is not aware of any studies being undertaken to compare the results of using this gear type compared with those obtained using the standard gear type (Day grab) used for this purpose, nor know of the consequences of using this gear type on the concentrations of the contaminants. It would be beneficial to compare results with any other data nearby that has been collected using the correct gear, to provide confidence in the results.	A 0.1 m^2 Mini-Hamon grab was used to collect the physico-chemical data due to the course nature of the sediment in the survey area, i.e., the sediment was too coarse to obtain successful day grab samples. Sediments with a finer particle size, such as clays and muds, can act as adsorption surfaces for contaminants that may be released into the water column if the sediment is disturbed (Cefas, 2001). Sediments with larger particle sizes (e.g. sands) are not typically associated with elevated concentrations of anthropogenic contaminants. Hydrocarbons in particular are closely linked to the spatial distribution of sediment types. The concentrations of metals in sediments are generally higher in the coastal zone and around estuaries, decreasing offshore, indicating that river input and run-off from land are significant sources. As presented in Appendix A of **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**, Results of the chemical analyses revealed that hydrocarbon concentrations across the majority of the Hornsea Four survey area were within the expected UKOOA (2001) background concentrations. Some elevation in total hydrocarbon (THC) concentrations was noted nearby existing infrastructure which was expected. Gas chromatography traces were typical of background levels of hydrocarbon inputs in areas of historical oil and gas exploration

Interest Party	Relevant Representation	Section in this note where the concerns are addressed
		such as the North Sea (McDougall, 2000). Therefore, it is the Applicant's position that the surveys were sufficient for the purposes of characterisation for the purposes of EIA.
Natural England	Certain impacts assessed for the project alone are not considered in the cumulative assessment, as they are assessed as 'not significant' on a project alone basis. Natural England believe these should be carried forward to the CEA or the Applicant needs to provide further detail to justify the exclusion of these potential cumulative impacts (Construction phase: - Direct and indirect seabed disturbances leading to the release of sediment contaminants… It should also be noted that the CEA may need to be updated following adjustments to the 'project alone' assessments.	See Section 4.3 of this clarification note.
Natural England	**Section 2.7.1.15:** Of the metals, arsenic at several stations across both the array and ECC exceeded the ISQG (TEL) and CEFAS Action Level 1 (AL1). At ECC Station ECC_14, arsenic also exceeded the ISQG PEL and this is not stated within the ES (para 2.7.1.16). Neither the ES or technical report explores the potential source for the regionally elevated arsenic and it would be useful to understand (for example from existing literature or previous surveys) whether this is considered to be natural (e.g. associated with sediment mineralogy, underlying geology) or anthropogenic in origin.	See Section 3 of this clarification note which provides collates all contaminants information and provides regional context.
Natural England	**Section 2.7.1.18:** The ES does not provide an assessment as to whether there was any evidence the above elevated contaminants were having an adverse effect on the baseline benthic community composition and structure, particularly within the ECC. This is touched upon within the array survey report, however comparisons in the technical report mainly focus on the link between the variation in physical sediment properties. Natural England recommends this aspect is clarified by the Applicant. This will help to further inform whether the contaminants would be a cause for concern (or not) due to sediment disturbance and re-suspension impacts from construction activities, or if removed for sediment disposal.	See Sections 4.2 and 4.3 of this clarification note for a full justification as to why the level of contamination and the implications of the proposed works will not be significant in EIA terms.
Natural England	Detailed comments – Volume A2.2 Benthic and intertidal ecology: Point 12 **Section 2.11.1.39 – 2.11.1.41:** Sediment contamination has been discussed in point 1 of this table, and those comments are also relevant to this section of the impact assessment (2.11.1.39 onwards). More discussion of toxicity thresholds is required to	Further discussion regarding the potential toxicity of thresholds is provided in Section 4 of this clarification note. Concentrations of all metals and PAHs recorded within the project specific surveys have been presented against the Cefas Action Levels (where available) and provided

Interest Party	Relevant Representation	Section in this note where the concerns are addressed
	help fully assess the impact these contaminated sediments might have to the faunal community. THC concentrations are compared to regional UKOOA, 2001 background data. It is also as important to compare these to the aforementioned SEI thresholds (UKOOA, 2001, 2005) and Kingston, 1992 for impacts to fauna community as a result of sediment disturbance. For PAHs, while comparison to OSPAR BACs, is useful to assess if concentrations are typical of background levels, it is thresholds such as the ISQG TEL and PEL that will provide confidence in the potential toxicity of PAH concentrations along with comparison to CEFAS Action Level 1. We also note that the statement that "As concentrations are higher than CEFAS AL 1 at all stations along the ECC" is incorrect. CEFAS AL 1 was exceeded at 7 of the ECC stations and the Canadian ISQG TEL at 15 of the ECC stations. Natural England recommends the Applicant provides evaluation of these additional thresholds as part of the determination of the magnitude of impact.	against the Interim Sediment Quality Guidelines (ISQG) TEL and PEL thresholds in Section 3 of this note for the purposes of clarification. An assessment of the impact of the potential release of contaminated sediments is provided in Section 4 of this clarification note. It should be noted that this has been informed by several documents with the Applicant's DCO Application.
Natural England	Detailed comments – Volume A2.2 Benthic and intertidal ecology: Point 13 **Section 2.11.1.43:** There is little evidence provided of the impact of direct and indirect seabed disturbances leading to the release of sediment contaminants (BIE-C-6) but the magnitude is concluded to be negligible which rules out the need to consider sensitivity. Addressing point 13 above will improve evidence of the impact. Natural England would encourage the ExA to seek advice from Cefas on possible impacts and significant of disturbing contaminated sediments as they have more expertise in his area.	The Applicant disagrees with this statement and numerous documents (as outlined in Section 4 of this note) consider the impact of sediment contaminants as part of the Applicant's ES. Please see the MMO (and Cefas') Relevant Representations which have not raised concerns in this matter. In addition, the Environment Agency have not raised concerns in relation to marine water quality or potential impacts under the Water Framework Directive arising from Hornsea Four. An assessment of the impact of the potential release of contaminated sediments is provided in Sections 4.2 and 4.3 of this note. It should be noted that this has been informed by several documents with the Applicant's DCO Application.
Natural England	Detailed comments – Volume A2.2 Benthic and intertidal ecology: Point 15 **Section 2.12.1.7:** Natural England advise that the following two impacts should not have been excluded from the CEA based on Hornsea 4 alone not leading to significant	See Section 4.3 of this clarification note provides a collation of evidence to justify the Applicant's position presented that no significant effects (in EIA terms) would arise from the disturbance of sediment bound contaminants.

Interest Party	Relevant Representation	Section in this note where the concerns are addressed
	impacts. These two impacts have been assessed as 'non significant' rather than 'negligible' where the methodology states they could be excluded from the CEA. Natural England believe a CEA should be carried out for these two impacts (appreciating it will probably conclude 'not significant'),or provide further detail to justify the exclusion of these potential cumulative impacts • Construction phase: - Direct and indirect seabed disturbances leading to the release of sediment contaminants: the potential significance of the impact from Hornsea 4 alone has been assessed as not significant.	
Natural England	Detailed comments – Volume A5.2.1 Benthic and intertidal ecology technical report: Point 20 **Section 5.4.2.7:** The number of stations where the CEFAS AL1 threshold was exceeded does not match the results tabulated within the Appendix D for the ECC benthic survey. Further consideration of the source and therefore the level of potential concern for the elevated As concentrations is not fully explored and this is highlighted in comments to the ES point 2. Natural England suggest using available literature to explore the regional trend for As.	Concentrations of all metals and PAHs recorded within the project specific surveys have been presented against the Cefas Action Levels (where available) and provided against the ISQG TEL and PEL thresholds in **Section 3** of this note for the purposes of clarification. Further information regarding the potential sources of contaminants is provided in **Section 3**.
Natural England	Detailed comments – Volume A4.4.4: Dredging and Disposal (Site Characterisation): Point 31 **Section 6.2.2.2 and 6.2.3.2:** As in point 1 & 13 above, high levels of contaminants have been found in some sediment samples as described in the 'benthic and intertidal ecology' chapter and 'Technical report'. Should evidence arise that the dredging and disposal of these sediments could have environmental impacts due to the high contaminant levels they contain, Natural England wants to see measures in place to minimising this effect.	As presented in **Sections 4.2** and **4.3** of this clarification note, it is the Applicant's position that significant environmental impacts (in EIA terms) will not occur. This is supported by the information provided in **Volume A4, Annex 4.4: Dredging and Disposal (Site Characterisation) (APP-042)**.

Table 2: Representations made to date in the examination process

Interest Party	Deadline 2 Representations	Applicant's Response at Deadline 3	Section in this note where the concerns are addressed
Natural England	Further consideration needs to be given to the impact of drill arising material being deposited on the seabed. Impact of contaminated sediments The impact of drill arising is still an outstanding concern of Natural England REP066 has gone some way to clarifying the level of contaminants within sediments however the document doesn't provide sufficient confidence on the impact these might have to the benthos.	The Applicant can confirm that further consideration is being given to the impact of drill arisings with a clarification note due to be submitted into Examination at Deadline 5. An update will be made **to G1.44 Clarification Note on Marine Sediment Contaminants** following Natural England's contaminants comments and this will be submitted at Deadline 4.	**Sections 4.2** and **4.3** provides further evidence that the levels of contamination present will not have significant adverse impacts on benthic ecology.
	Natural England welcome the additional document provided by the Applicant (G1.44 Clarification note on marine sediment contaminants revision 1 [REP1-066] which helps clarify all contaminant levels and highlight where thresholds (CEFAS Action Levels and Canadian Marine Sediment Quality Guidelines) have been exceeded. It removes any concerns around inconsistencies in interpretation of the data tables and between the benthic ES chapter [APP-014] and the technical Annex [APP-068]. One example of exceedance which we were concerned about (PAH) appears to have been a typographic error. We welcome the additional information around source of Arsenic within the sediments and note that the levels are considered normal within the region. We do wish to seek clarification from the Applicant or Cefas on why the CAL1 thresholds haven't been used for PAH (limit of 0.1mg/kg).	The Applicant welcomes the resolution of the concerns around inconsistencies in the interpretation of data tables, particular exceedances, and regional context. In **G1.44 Clarification Note on Marine Sediment Contaminants [REP1-066]**, the PAH results are presented against the Interim Sediment Quality Guidelines which generally consist of a lower thresholds in the order of µg/kg versus mg/kg (100 µg/kg = 0.1 mg/kg). However, the Applicant will update this note for Deadline 4.	**Section 3.1.3** of this note provides further details of the baseline PAH results.

Interest Party	Deadline 2 Representations	Applicant's Response at Deadline 3	Section in this note where the concerns are addressed
	Given the number of samples which exceed the recognised thresholds particularly within the ECC Natural England cannot agree with the generalisation (made in G1.44 Section 4.1.1.2) that the chemical composition of all the material being disturbed are typical of wider regional background. Natural England advises further review and expansion of data interpretation by the Applicant is needed to provide suitable evidence that despite the threshold exceedances, the chemical constituents within the ECC were not adversely affecting the faunal community at the time of the survey. For example linking the chemical and benthic fauna composition through description and expansion of the statistical analysis described in Paras 5.5.2.22 to 5.5.2.24 of the technical appendix [APP-068] or a check of the species recorded at stations with CEFAS exceedances against published sensitivities such reported as part of the MarsSEA MarLIN - The Marine Life Information Network - Species (A-Z), We note the latter was undertaken within the technical Annex for the Array area [APP-068], but not for the export cable corridor. A similar comment was made by the Applicants in response to our Relevant Representations RR-029- APDX:F-31 "Furthermore, the biotopes present within the array area and ECC are considered to be tolerant of chemical pressures, as presented within the MarESA assessment". This	The Applicant agrees with Natural England's comment, however whilst further statistical analysis would be useful, it should be noted that the survey was not designed for the purposes of exploring the impact of chemical contaminants on benthic faunal abundance and therefore there would be limited statistical power in doing so. It is proposed that the Applicant will undertake a check of the species recorded at stations with CEFAS exceedances against published sensitivities such reported as part of the MarsSEA MarLIN - The Marine Life Information Network - Species (A-Z) and provide further detail in an updated version of **G1.44 Clarification Note on Marine Sediment Contaminants** at Deadline 4.	**Section 4.2** provides further evidence that the levels of contamination present will not have significant adverse impacts on benthic ecology.

Interest Party	Deadline 2 Representations	Applicant's Response at Deadline 3	Section in this note where the concerns are addressed
	may provide some level of reassurance that could be used as part of expert judgement in determining the likelihood that sediment disposal will result in adverse effects as concluded in Section 4.1.2.4 of the contaminant clarification note.		
	Natural England queries the highlighted CEFAS Action level organotin exceedances (including two stations within the ECC above CEFAS Action Level 2) as these organotin exceedances were not previously reported in the technical annex [APP-068]. We recommend this is checked against the raw data by the Applicant as the data within the table suggests the measurement unit is mg/kg (ppm). The array report highlights that all concentrations were ≤1ng g (equivalent to µg/kg or ppb) at all stations. In contrast the CEFAS Action levels are reported in units of mg/kg (ppm). If the organotin concentrations reported within this clarification note are correct and CEFAS AL1 and AL2 are exceeded, Natural England would have concerns about environmental impacts during construction. This should be of note by the MMO in determining the suitability of sediments for disposal as this would not have been considered following their review of the benthic ES chapter and technical Annex.	The concentrations presented for tin in **G1.44 Clarification Note on Marine Sediment Contaminants (REP1-066)** are consistent with those presented in Table D 11 of Appendix D of A5.2.1: Benthic and Intertidal Ecology Technical Report (APP-068) (i.e. presented in mg/ kg). The Applicant will provide a revised version of **G1.44 Clarification Note on Marine Sediment Contaminants** at Deadline 4 which provides further assurance that these discrete elevated concentrations will not result in significant effects if disturbed or disposed of.	The Applicant thanks Natural England for their observations via email. The Applicant can confirm that organotins do not exceed Cefas Action Level 1 in either the array or ECC.
	Natural England are less concerned with the accidental release of pollutants from human sources, rather this point was referring to the high levels of contaminants found in the benthic	The Applicant will provide a revised version of **G1.44 Clarification Note on Marine Sediment Contaminants at Deadline 4** which provides further assurance elevated contaminant	**Section 3.1.4** of this note provides further justification that the sediments are representative of the wider background and therefore appropriate for dredging and disposal. The Applicant would welcome confirmation from Cefas and the MMO.

Interest Party	Deadline 2 Representations	Applicant's Response at Deadline 3	Section in this note where the concerns are addressed
	sediments themselves and what might happen when these are disturbed during dredging and disposal. We welcome the statement about biotopes being tolerant to chemical pressures within the order limits and this will to some extent relieve our concerns. However we seek guidance from Cefas and the MMO on the suitability of those sediments which exceed contamination thresholds CAL 1 & ISQG TEL (as identified in RREP1-066 Clarification Note on Marine Sediment Contaminants Revision: 1) for dredging and disposal activities associated with construction.	concentrations will not result in significant effects if disturbed or disposed of.	

2 Relevant thresholds

2.1.1 Cefas Action Levels

2.1.1.1 The Cefas Action Levels are used as part of a 'weight of evidence' approach to assessing the suitability of material for disposal at sea but are not themselves statutory standards. There are no Environmental Quality Standards (EQSs) for *in situ* sediments in the UK. In the absence of any defined EQSs, data from the surveys is analysed relative to the Cefas Action Levels for the disposal of dredged material. This may be used to provide evidence for decision makers about the disposal of dredged material, they are not however statutory. The Cefas Action Levels are presented in **Table 3**. These levels were used in this assessment to determine whether further assessment is required rather than a pass/ fail criterion.

2.1.1.2 For dredging projects, contaminants below the Cefas Action Level 1 (CAL1) are not considered to be of concern and are approved for disposal at sea. Contaminant levels above Cefas Action Level 2 (CAL2) are not considered suitable for disposal at sea without further consideration. It is noted that Hornsea Four is not a proposed dredging scheme but, given the project proposal to dredge, drill and dispose of seabed material within the Hornsea Four Order Limits, and in keeping with common practice, contaminants were contextualised against the Cefas Action Levels to provide an indicative risk to the environment.

2.1.1.3 There is currently no guidance or procedure in place regarding the handling of sediments which fall between CAL1 and CAL2 or the lines of evidence that should be considered to evaluate these samples (Cefas, 2015). Furthermore, the High Level Review of Current UK Action Level Guidance (Cefas, 2015) states:

"Suitability for disposal of sediments between CAL1 and CAL2 is determined through expert judgement based on evaluation of a number of lines of evidence including historical information, disposal site characteristics and physical characteristics of the material."

2.1.1.4 The Applicant has provided a detailed characterisation of the disposal site characteristics and physical characteristics of the material being disposed of in **Volume A4, Annex 4.4: Dredging and Disposal (Site Characterisation) (APP-042)**. In addition, historical information and potential sources of contaminants were discussed in **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**.

Table 3: Cefas Action Levels.

Contaminant/ Compound	Action Level 1	Action Level 2
	mg/kg Dry Weight	mg/kg Dry Weight
Arsenic	20	100
Mercury	0.3	3
Cadmium	0.4	5
Chromium	40	400
Copper	40	400
Nickel	20	200
Lead	50	500
Zinc	130	800
Orgotins; TBT DBT MBT	0.1	1
PCB's, sum of ICES 7	0.01	None
PCB's, sum of 25 congeners	0.02	0.2
PAHs	0.1	None
*DDT	*0.001	N/A
*Dieldrin	*0.005	N/A

*as set in 1994

2.1.2 Canadian Marine Sediment Quality Guidelines

2.1.2.1 In addition to the Cefas Action Levels, the Canadian sediment quality guidelines have been utilised to provide further context, and for contaminants such as PAHs that are not captured within the Cefas Action Levels. The Canadian Sediment quality guidelines were developed by the Canadian Council of Ministers of the Environment as broadly protective tools to support the functioning of healthy aquatic ecosystems. They are based on field research programmes that have demonstrated associations between chemicals and biological effects by establishing cause and effect relationships in particular organisms. Comparison of measured concentrations of various contaminants within the sediments with these guideline values provided a basic indication on the degree of contamination and likely impact on ecology.

2.1.2.2 The guidelines consist of Threshold Effect Levels (TELs) (also known as interim sediment quality guidelines) and Probable Effect Levels (PELs). The TELs and PELs are used to identify the following three ranges of chemical concentrations with regard to biological effects:

- Below the TEL - the minimal effect range within which adverse effects rarely occur;
- Between the TEL and PEL - the possible effect range within which adverse effects occasionally occur; and
- Above the PEL - the probable effect range within which adverse effects frequently occur.

2.1.2.3 Table 4 presents the guidelines for the TELs and PELS. Where Cefas Action Levels are not available for a substance then TELs and PEL have been utilised to characterise the baseline environment.

Table 4: Canadian Marine Sediment Quality Guidelines.

Substance	Units	TEL	PEL
Metals			
Arsenic	mg/kg	7.24	41.6
Cadmium	mg/kg	0.7	4.2
Chromium	mg/kg	52.3	160
Copper	mg/kg	18.7	108
Lead	mg/kg	30.2	112
Mercury	mg/kg	0.13	0.7
Zinc	mg/kg	124	271
Polychlorinated byphenyls (PCB)			
PCBs: total PCBs	mg/kg	21.5	189
Polyaromatic hydrocarbons (PAH)			
Acenaphthene	µg/kg	6.71	88.9
Acenaphthylene	µg/kg	5.87	128
Anthracene	µg/kg	46.9	245
Benz(a)anthracene	µg/kg	74.8	693
Benzo(a)pyrene	µg/kg	88.8	763
Chrysene	µg/kg	108	846
Dibenz(a,h)anthracene	µg/kg	6.22	135
Fluoranthene	µg/kg	113	1,494
Fluorene	µg/kg	21.2	144
2-Methylnaphthalene	µg/kg	20.2	201
Naphthalene	µg/kg	34.6	391
Phenanthrene	µg/kg	86.7	544
Pyrene	µg/kg	153	1,398

3 Sediment Quality Baseline

3.1.1.1 This section has collated information from the following sources with the Applicant's DCO Application:

- Appendix A of Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068); and
- Appendix D of Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068).

3.1.1.2 Within **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**, specifically Figure 1.1 of Appendix A and Figure D.1 of Appendix D, the locations of the project specific sampling locations are presented, which are discussed in more detail below.

3.1.2 Metals

3.1.2.1 Further details of the chemical analysis undertaken for Hornsea Four are provided in these Appendices. **Table 5** presents the metal contaminants in the context of the Cefas Action Levels. As denoted by the yellow shading, ~~both~~ arsenic ~~and organotins are~~is between CAL1 and CAL2 within the array at three stations ~~Approximately 27% of samples (seven samples) in the ECC are above between CAL1 and CAL2 for arsenic and organotins within the ECC~~ (**Table 5**). One sample in the ECC (ECC_24) exceeded CAL1 for nickel. ~~Two sample (ECC_21 and ECC_23) exceeded CAL2 for organotins.~~ The following metals do not exceed CAL1 in any of the samples:

- Mercury;
- Cadmium;
- Chromium;
- Copper;
- Organotins
- Lead; and
- Zinc.

3.1.2.2 In addition, the metals have been provided in the context of the ISQGs in **Table 6**. Approximately 41% and 58% of samples are between TEL and PEL for arsenic in the array and ECC respectively. There is one exceedance of PEL for arsenic in the ECC (ECC_14). The values for TEL and PEL are more precautionary than CAL1 and CAL2 for arsenic. In addition, two samples are between TEL and PEL for lead in the ECC. The following metals do not exceed TEL in any of the samples:

- Mercury;
- Cadmium;
- Chromium;
- Copper; and
- Zinc.

3.1.2.3 Natural sources of arsenic in the marine environment include (but are not limited to) remobilisation and erosion of arsenic-rich rocks (Research Council of Norway, 2012), which vary naturally according to local geology; anthropogenic sources include mining and

smelting (Research Council of Norway, 2012), as well as the burning of fossil fuels (ICES, 2004). Due to the high natural occurrence of this metal, it is often difficult to precisely discern between natural and anthropogenic sources of this metal (OSPAR, 2005). The arsenic concentrations (**Table 5**) were within the range reported for the southern North Sea: < 0.5 mg kg^{-1} to 135 mg kg^{-1} of dry weight arsenic (Whalley *et al.*, 1999). When considered within this context, the recorded data are considered typical for the region and not of particular note in terms of contamination.

3.1.2.4 Organotins including Tributyltin (TBT) has been used historically on ship hulls and other marine structures to prevent biofouling growth of aquatic organisms (Bryan *et al*, 1986). The use of TBT was prohibited in 1987, but has remained persistent within the marine environment with associated effects on ecology (such as imposex gastropods). Concentrations are typically highest in or near marinas and areas of higher shipping densities.

3.1.2.5 Lead typically enters the marine environment from the atmosphere via rainfall. However, oil and gas activities may result in elevated concentrations. The range in the North Sea is 0.02-0.1 µg l^{-1} (Cefas, 2001).

Table 5: Project specific metal contaminants data in the context of the Cefas Action Levels.

Location	Station	Arsenic	Mercury	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Organotins (TBT, DBT MBT)
CAL1 (mg/kg Dry Weight)		20	0.3	0.4	40	40	20	50	130	0.1
CAL21 (mg/kg Dry Weight)		100	3	5	400	400	200	500	800	1
Array	ENV1	5.9	0.02	0.05	5.8	5.9	2.9	3.8	11.3	bLOD<0.5
Array	ENV2	21	0.01	0.11	8.7	7.2	7.9	6.3	21	bLOD<0.5
Array	ENV4	4.4	0.01	0.06	8.1	7.1	4.2	5.1	15.1	bLOD<0.5
Array	ENV5	15.8	0.01	0.06	6.3	5.6	3.6	5.4	21.7	bLOD<0.5
Array	ENV6	10.9	0.01	0.06	6.9	6.1	3.5	5.1	16.8	bLOD<0.5
Array	ENV8	4.3	0.05	0.05	7.7	5.7	4	5.2	16.9	bLOD0.5
Array	ENV9	5.3	0.04	0.08	8.9	6.5	5.2	5.8	20.9	bLOD0.5
Array	ENV10	4.2	0.03	0.07	7.9	7.2	4	5.7	18.5	0.0010.5
Array	ENV11	5	0.02	0.05	7.8	5.9	3.5	4.7	15.7	bLOD 0.5
Array	ENV14	4.2	0.03	0.08	7.3	6.2	3.8	5.2	15.2	0.001<0.5
Array	ENV15	7.2	0.03	0.07	9.5	6.2	4.1	7.2	19.5	0.001<0.5
Array	ENV16	31.8	0.03	0.06	10	7.3	6	12.2	22.4	bLOD <0.5
Array	ENV17	24.2	0.05	0.05	13.5	6.5	8	10.8	24.8	0.0010.6
Array	ENV18	13.7	0.02	0.06	6.4	6.2	5.2	6.8	23.1	bLOD <0.5
Array	ENV19	6.8	0.03	0.08	9.1	7.2	4.6	7.4	22.1	0.0010.5
Array	ENV20	4.9	0.01	0.06	6.1	6.9	3.1	4.1	13.7	bLOD<0.5
Array	ENV21	7.5	0.02	0.05	10	6.2	4.3	7.6	17.7	bLOD<0.5
Array	ENV22	15.3	0.02	0.06	9.7	6.2	4.3	9.6	22.4	bLOD<0.5
Array	ENV23	6.1	0.02	<0.04	6.6	5	3.3	3.7	10.8	bLOD<0.5
Array	ENV24	20	<0.01	0.09	9.1	10.8	6.5	8.5	22.1	bLOD0.5
Array	ENV25	18.5	0.02	0.09	7.1	7.4	4.9	8	18.3	0.001<0.5
ECC	ECC_01	5.6	<0.015	<0.04	6.9	5	3.8	5.1	17.9	bLOD<0.5
ECC	ECC_02	8.9	<0.015	<0.04	8.1	4.6	4.3	5.7	23.3	bLOD<0.5
ECC	ECC_03	4.2	<0.015	<0.04	7.1	5.6	3.7	5.5	22.6	bLOD<0.5

Location	Station	Arsenic	Mercury	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Organotins (TBT, DBT MBT)
ECC	ECC_04	3.7	<0.015	<0.04	6.8	5.3	3.8	5.6	22.3	bLOD~~<0.5~~
ECC	ECC_05	4.9	<0.015	<0.04	8.1	6	4.6	6.9	21.1	bLOD~~<0.5~~
ECC	ECC_06	5.4	0.06	0.05	8.8	6.2	4.9	7.9	19.7	bLOD~~<0.5~~
ECC	ECC_07	4.6	<0.015	0.04	7	5.4	3.9	7.1	36.7	bLOD~~<0.5~~
ECC	ECC_08	5.4	<0.015	0.06	7.9	7	4.6	7.8	33.8	bLOD~~<0.5~~
ECC	ECC_09	7.8	<0.015	<0.04	9.7	6.3	5.3	8.3	25.9	bLOD~~<0.5~~
ECC	ECC_10	6.4	<0.015	<0.04	8.6	5.5	4.6	8.6	22.3	bLOD~~<0.5~~
ECC	ECC_11	5.3	<0.015	0.07	6.7	6	3.8	7	22.9	bLOD~~<0.5~~
ECC	ECC_12	9.4	<0.015	<0.04	7.2	4.8	3.9	7.6	16.4	bLOD~~<0.5~~
ECC	ECC_13	6	0.03	0.05	8	6.7	4.2	7.7	19.9	bLOD~~<0.5~~
ECC	ECC_14	48.7	<0.015	0.13	10.3	5.6	9.4	20.7	32.7	bLOD~~<0.5~~
ECC	ECC_15	18.7	<0.015	0.06	9.6	4.8	4.9	15.7	29.2	bLOD~~<0.5~~
ECC	ECC_16	20.2	<0.015	<0.04	9.5	5.5	6.1	18.8	31.6	bLOD~~<0.5~~
ECC	ECC_17	37	<0.015	0.04	12	5.6	7.5	35.6	35.2	bLOD~~<0.5~~
ECC	ECC_18	38	<0.015	0.08	14.4	7.2	10.8	25.3	43.8	bLOD~~0.5~~
ECC	ECC_19	24	0.03	0.13	17	11.5	13.3	41.9	68.2	bLOD~~1~~
ECC	ECC_20	23.3	0.02	<0.04	13.2	8.9	12.8	19	48.8	bLOD~~1~~
ECC	ECC_21	15.8	0.03	0.06	20.1	15.7	20.1	24.3	63	bLOD~~1.9~~
ECC	ECC_23	23.3	<0.015	0.06	6.9	6.6	9.6	9.2	34.5	bLOD~~1.1~~
ECC	ECC_24	17.2	<0.015	<0.04	8.5	6.6	7.5	17.7	43.6	bLOD~~1~~
ECC	ECC_25	15.4	0.04	<0.04	7.5	7.2	7.3	20.5	37.3	bLOD~~1~~
ECC	ECC_26	12.7	0.05	<0.04	7.2	6.7	6.5	18.7	38.6	bLOD~~0.9~~
ECC	ECC_27	14.1	0.1	<0.04	7.8	6.6	6.6	16.9	35.8	bLOD~~0.9~~

Below CAL1

Above CAL1 but below CAL2

Above CAL2

bLOD = below Level of Detection

Table 6: Project specific metal contaminants data in the context of the ISQGs.

Location	Station	Arsenic	Mercury	Cadmium	Chromium	Copper	Lead	Zinc
ISQG TEL		7.24	0.13	0.7	52.3	18.7	30.2	124
ISQG PEL		41.6	0.7	4.2	160	108	112	271
Array	ENV1	5.9	0.02	0.05	5.8	5.9	3.8	11.3
Array	ENV2	21	0.01	0.11	8.7	7.2	6.3	21
Array	ENV4	4.4	0.01	0.06	8.1	7.1	5.1	15.1
Array	ENV5	15.8	0.01	0.06	6.3	5.6	5.4	21.7
Array	ENV6	10.9	0.01	0.06	6.9	6.1	5.1	16.8
Array	ENV8	4.3	0.05	0.05	7.7	5.7	5.2	16.9
Array	ENV9	5.3	0.04	0.08	8.9	6.5	5.8	20.9
Array	ENV10	4.2	0.03	0.07	7.9	7.2	5.7	18.5
Array	ENV11	5	0.02	0.05	7.8	5.9	4.7	15.7
Array	ENV14	4.2	0.03	0.08	7.3	6.2	5.2	15.2
Array	ENV15	7.2	0.03	0.07	9.5	6.2	7.2	19.5
Array	ENV16	31.8	0.03	0.06	10	7.3	12.2	22.4
Array	ENV17	24.2	0.05	0.05	13.5	6.5	10.8	24.8
Array	ENV18	13.7	0.02	0.06	6.4	6.2	6.8	23.1
Array	ENV19	6.8	0.03	0.08	9.1	7.2	7.4	22.1
Array	ENV20	4.9	0.01	0.06	6.1	6.9	4.1	13.7
Array	ENV21	7.5	0.02	0.05	10	6.2	7.6	17.7
Array	ENV22	15.3	0.02	0.06	9.7	6.2	9.6	22.4
Array	ENV23	6.1	0.02	<0.04	6.6	5	3.7	10.8
Array	ENV24	20	<0.01	0.09	9.1	10.8	8.5	22.1
Array	ENV25	18.5	0.02	0.09	7.1	7.4	8	18.3
ECC	ECC_01	5.6	<0.015	<0.04	6.9	5	5.1	17.9
ECC	ECC_02	8.9	<0.015	<0.04	8.1	4.6	5.7	23.3
ECC	ECC_03	4.2	<0.015	<0.04	7.1	5.6	5.5	22.6
ECC	ECC_04	3.7	<0.015	<0.04	6.8	5.3	5.6	22.3
ECC	ECC_05	4.9	<0.015	<0.04	8.1	6	6.9	21.1
ECC	ECC_06	5.4	0.06	0.05	8.8	6.2	7.9	19.7
ECC	ECC_07	4.6	<0.015	0.04	7	5.4	7.1	36.7
ECC	ECC_08	5.4	<0.015	0.06	7.9	7	7.8	33.8
ECC	ECC_09	7.8	<0.015	<0.04	9.7	6.3	8.3	25.9
ECC	ECC_10	6.4	<0.015	<0.04	8.6	5.5	8.6	22.3
ECC	ECC_11	5.3	<0.015	0.07	6.7	6	7	22.9
ECC	ECC_12	9.4	<0.015	<0.04	7.2	4.8	7.6	16.4
ECC	ECC_13	6	0.03	0.05	8	6.7	7.7	19.9
ECC	ECC_14	48.7	<0.015	0.13	10.3	5.6	20.7	32.7
ECC	ECC_15	18.7	<0.015	0.06	9.6	4.8	15.7	29.2
ECC	ECC_16	20.2	<0.015	<0.04	9.5	5.5	18.8	31.6
ECC	ECC_17	37	<0.015	0.04	12	5.6	35.6	35.2
ECC	ECC_18	38	<0.015	0.08	14.4	7.2	25.3	43.8

Location	Station	Arsenic	Mercury	Cadmium	Chromium	Copper	Lead	Zinc
ECC	ECC_19	24	0.03	0.13	17	11.5	41.9	68.2
ECC	ECC_20	23.3	0.02	<0.04	13.2	8.9	19	48.8
ECC	ECC_21	15.8	0.03	0.06	20.1	15.7	24.3	63
ECC	ECC_23	23.3	<0.015	0.06	6.9	6.6	9.2	34.5
ECC	ECC_24	17.2	<0.015	<0.04	8.5	6.6	17.7	43.6
ECC	ECC_25	15.4	0.04	<0.04	7.5	7.2	20.5	37.3
ECC	ECC_26	12.7	0.05	<0.04	7.2	6.7	18.7	38.6
ECC	ECC_27	14.1	0.1	<0.04	7.8	6.6	16.9	35.8

Below TEL
Above TEL but below PEL
Above PEL

3.1.3 Polycyclic aromatic hydrocarbons

3.1.3.1 There are no exceedances of the TEL threshold for any of the PAHs within the array (**Table 8**). There are three sites (ECC_19 to ECC_21) along the ECC where numerous PAHs are recorded between TEL and PEL (**Table 8**). There are no exceedance of PEL for any individual PAHs.

3.1.3.2 As stated in paragraph 3.6.1.7 of **Appendix D of Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**, the higher Total Hydrocarbon Concentrations measured in a subset of the stations closer to shore (ECC_18 to ECC_21) is evident in the Gas Chromatography traces in the form of an elevated baseline of Unresolved Complex Mixtures. The presence of a consistent hydrocarbon signature from stations ECC_18 to ECC_21 is consistent with diffuse input of hydrocarbons from runoff and shipping activity, as opposed to point source input of hydrocarbons from oil and gas exploration and production where hydrocarbon contamination would typically be limited to an area of less than 1 km diameter.

~~3.1.3.1~~3.1.3.3 The Naphthalene, Phenanthrene and Dibenzothiophene proportions for stations ECC_17 to ECC_23 were in excess of 50% which is consistent with the higher silt and clay content at those stations, suggesting that PAH distribution is correlated with natural variation in the sediment character throughout the Hornsea Four offshore ECC. Natural and anthropogenic contaminants often appear elevated within fine sediments and particulate matter when compared to coarse sediments due to the increased adsorption capacity of organic matter and clay minerals (OSPAR, 2008).

3.1.3.4 As noted in paragraph 2.1.7.10 of **Volume A2, Chapter 2: Benthic and Intertidal Ecology (APP-014)**, Gas Chromatography traces across the array area were generally indicative of background levels of hydrocarbons in areas of historic oil and gas exploration and suggested a mixture of petrogenic and pyrogenic sources.

Table 7: Project specific PAHS contaminants data in the context of the CAL.

Location	Station	Polyaromatic hydrocarbons (PAH) (mg/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
CAL1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Array	ENV1						0.001		0.002			0.001	0.001
Array	ENV2				0.001	0.001	0.003		0.003			0.003	0.002
Array	ENV4				0.002	0.002	0.003		0.005		0.002	0.005	0.004
Array	ENV5				0.001	0.001	0.002		0.004			0.002	0.002
Array	ENV6						0.002		0.002			0.002	0.002
Array	ENV8				0.001	0.002	0.002		0.003		0.001	0.002	0.002
Array	ENV9				0.002	0.003	0.003		0.005		0.002	0.004	0.004
Array	ENV10				0.003	0.003	0.004		0.005		0.002	0.004	0.004
Array	ENV11				0.001	0.002	0.002		0.003			0.002	0.002
Array	ENV14					0.001	0.001		0.002			0.002	0.002
Array	ENV15				0.003	0.003	0.004	0.001	0.005		0.002	0.004	0.004
Array	ENV16				0.002	0.003	0.004	0.001	0.005		0.002	0.005	0.004
Array	ENV17			0.001	0.004	0.005	0.006	0.002	0.008	0.001	0.005	0.008	0.006
Array	ENV18												
Array	ENV19				0.002	0.003	0.004	0.001	0.005		0.002	0.005	0.004
Array	ENV20						0.001		0.001			0.001	0.001
Array	ENV21				0.002	0.002	0.003		0.004		0.002	0.003	0.003
Array	ENV22				0.001	0.002	0.002		0.003		0.001	0.002	0.002
Array	ENV23											0.001	
Array	ENV24				0.001	0.001	0.002		0.002		0.001	0.006	0.002
Array	ENV25						0.001		0.001			0.002	0.001

Location	Station	Polyaromatic hydrocarbons (PAH) (mg/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
ECC	ECC_01				0.002	0.002	0.003		0.004		0.002	0.006	
ECC	ECC_02						0.002		0.002			0.002	
ECC	ECC_03				0.001	0.002	0.002		0.003		0.001	0.003	
ECC	ECC_04				0.001	0.002	0.002		0.003			0.003	
ECC	ECC_05				0.001	0.002	0.002		0.003			0.003	
ECC	ECC_06				0.002	0.002	0.003		0.004		0.002	0.004	
ECC	ECC_07				0.002	0.003	0.004		0.005		0.002	0.005	
ECC	ECC_08				0.004	0.004	0.006		0.008		0.003	0.007	
ECC	ECC_09				0.003	0.003	0.005		0.006		0.003	0.008	
ECC	ECC_10				0.003	0.003	0.005		0.007		0.003	0.008	
ECC	ECC_11				0.002	0.002	0.003		0.004		0.001	0.005	
ECC	ECC_12				0.002	0.002	0.003		0.005		0.002	0.005	
ECC	ECC_13				0.002	0.002	0.002		0.003		0.002	0.003	
ECC	ECC_14				0.001		0.002		0.003			0.002	
ECC	ECC_15				0.003	0.003	0.005		0.008		0.003	0.009	
ECC	ECC_16				0.002	0.002	0.004		0.004		0.003	0.006	
ECC	ECC_17				0.003	0.003	0.005		0.006	0.001	0.006	0.010	
ECC	ECC_18	0.002	0.004	0.006	0.018	0.018	0.025	0.004	0.029	0.006	0.026	0.059	0.004
ECC	ECC_19	0.005	0.010	0.015	0.049	0.047	0.058	0.010	0.082	0.019	0.076	0.093	0.011
ECC	ECC_20	0.007	0.018	0.030	0.093	0.082	0.117	0.014	0.157	0.029	0.114	0.258	0.019
ECC	ECC_21	0.007	0.016	0.024	0.073	0.067	0.088	0.013	0.118	0.029	0.123	0.149	0.015
ECC	ECC_22			0.002	0.005	0.004	0.006		0.008	0.002	0.009	0.012	
ECC	ECC_23				0.004	0.003	0.008		0.009		0.004	0.006	0.001

Location	Station	Polyaromatic hydrocarbons (PAH) (mg/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
ECC	ECC_24			0.001	0.004	0.004	0.007		0.009	0.001	0.006	0.010	0.001
ECC	ECC_25				0.003	0.003	0.006		0.007		0.004	0.008	
ECC	ECC_26			0.004	0.009	0.008	0.011	0.002	0.016		0.005	0.009	0.003

	< 0.001 mg/kg
	Below CAL1
	Above CAL1

Table 8: Project specific PAHs contaminants data in the context of the ISQGs.

Location	Station	Polyaromatic hydrocarbons (PAH) (ug/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
ISQG TEL		6.71	5.87	46.9	74.8	88.8	108	6.22	113	21.2	34.6	86.7	153
ISQG PEL		88.9	128	245	693	763	846	135	1,494	144	391	544	1,398
Array	ENV1	<1	<1	<1	<1	<1	1	<1	2	<1	<1	1	1
Array	ENV2	<1	<1	<1	1	1	3	<1	3	<1	<1	3	2
Array	ENV4	<1	<1	<1	2	2	3	<1	5	<1	2	5	4
Array	ENV5	<1	<1	<1	1	1	2	<1	4	<1	<1	2	2
Array	ENV6	<1	<1	<1	<1	<1	2	<1	2	<1	<1	2	2
Array	ENV8	<1	<1	<1	1	2	2	<1	3	<1	1	2	2
Array	ENV9	<1	<1	<1	2	3	3	<1	5	<1	2	4	4
Array	ENV10	<1	<1	<1	3	3	4	<1	5	<1	2	4	4
Array	ENV11	<1	<1	<1	1	2	2	<1	3	<1	<1	2	2
Array	ENV14	<1	<1	<1	<1	1	1	<1	2	<1	<1	2	2
Array	ENV15	<1	<1	<1	3	3	4	1	5	<1	2	4	4
Array	ENV16	<1	<1	<1	2	3	4	1	5	<1	2	5	4
Array	ENV17	<1	<1	1	4	5	6	2	8	1	5	8	6
Array	ENV18	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Array	ENV19	<1	<1	<1	2	3	4	1	5	<1	2	5	4
Array	ENV20	<1	<1	<1	<1	<1	1	<1	1	<1	<1	1	1
Array	ENV21	<1	<1	<1	2	2	3	<1	4	<1	2	3	3
Array	ENV22	<1	<1	<1	1	2	2	<1	3	<1	1	2	2

Location	Station	Polyaromatic hydrocarbons (PAH) (ug/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
Array	ENV23	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
Array	ENV24	<1	<1	<1	1	1	2	<1	2	<1	1	6	2
Array	ENV25	<1	<1	<1	<1	<1	1	<1	1	<1	<1	2	1
ECC	ECC_01	<1	<1	<1	1.86	2.24	3.35	<1	3.99	<1	2.16	5.98	<1
ECC	ECC_02	<1	<1	<1	<1	<1	1.66	<1	2.38	<1	<1	2.19	<1
ECC	ECC_03	<1	<1	<1	1.36	1.72	2.24	<1	3.04	<1	1.42	2.68	<1
ECC	ECC_04	<1	<1	<1	1.35	1.78	2.25	<1	2.95	<1	<1	3.27	<1
ECC	ECC_05	<1	<1	<1	1.35	1.63	2.26	<1	3.08	<1	<1	2.56	<1
ECC	ECC_06	<1	<1	<1	1.6	2.06	2.75	<1	3.75	<1	1.68	3.64	<1
ECC	ECC_07	<1	<1	<1	2.45	2.7	3.97	<1	5.46	<1	2.18	4.67	<1
ECC	ECC_08	<1	<1	<1	3.58	4	5.8	1.32	7.89	<1	3.47	7.46	1.77
ECC	ECC_09	<1	<1	<1	2.69	2.87	4.59	<1	5.94	<1	3.3	8.09	<1
ECC	ECC_10	<1	<1	<1	3.12	3	4.93	<1	6.83	<1	2.77	8.06	<1
ECC	ECC_11	<1	<1	<1	2.02	2.22	3.33	<1	4.33	<1	1.41	4.59	<1
ECC	ECC_12	<1	<1	<1	2.16	2.23	3.45	<1	4.53	<1	1.94	5.08	<1
ECC	ECC_13	<1	<1	<1	1.51	1.81	2.38	<1	3.42	<1	1.64	2.75	<1
ECC	ECC_14	<1	<1	<1	1.08	<1	1.85	<1	2.66	<1	<1	1.61	<1
ECC	ECC_15	<1	<1	<1	3.31	2.99	5.2	<1	7.92	<1	2.84	9.25	<1
ECC	ECC_16	<1	<1	<1	2.02	2.17	3.65	<1	4.23	<1	3.45	6.42	<1
ECC	ECC_17	<1	<1	<1	3.42	3.33	5.25	<1	6.22	1.3	5.95	10.2	<1
ECC	ECC_18	1.92	3.52	6	18.2	17.6	25.1	3.58	29.1	6.12	26.2	58.5	4.2
ECC	ECC_19	5.06	10.3	15	49.1	46.5	58.3	9.65	82.4	18.5	75.6	93.1	11.1

Location	Station	Polyaromatic hydrocarbons (PAH) (ug/kg)											
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
ECC	ECC_20	6.75	17.7	30.3	93	81.7	117	14.3	157	29.1	114	258	19.2
ECC	ECC_21	7.11	15.6	24	73.1	67.1	88.3	13.3	118	29.2	123	149	15.4
ECC	ECC_22	<1	<1	1.66	4.63	4.14	6.46	<1	8.45	1.57	8.73	12	<1
ECC	ECC_23	<1	<1	<1	3.85	3.34	7.55	<1	9.25	<1	3.97	6.39	1.35
ECC	ECC_24	<1	<1	1.44	4.4	4.28	7.15	<1	8.81	1.47	5.7	9.91	1.37
ECC	ECC_25	<1	<1	<1	3.3	3.12	6.18	<1	7.01	<1	4.39	7.65	<1
ECC	ECC_26	<1	<1	3.5	8.66	8.3	11.4	1.52	15.9	<1	5.01	8.73	2.58

Below detection limit
Below TEL
Between TEL and PEL
Above PEL

3.1.4 Baseline macrofaunal assemblage

3.1.4.1 Natural England have requested a description of the faunal assemblages associated with the areas of higher PAH and metal contaminant levels, specifically requesting a link to be drawn between the chemical and benthic fauna composition through description and expansion of the statistical analysis presented with the Application, or a check of the species recorded at stations with CEFAS exceedances against published sensitivities such reported as part of the MarsSEA MarLIN. The following text provides a qualitative description of the species present at the areas, though it is important to note that the macrofaunal investigation undertaken for the Hornsea Four characterisation was designed to provide a detailed description of the benthic infauna and to describe how the assemblages vary across the Hornsea Four Order Limits. Whilst marine benthic invertebrate communities have been shown to be sensitive to environmental change and anthropogenic contamination (Davies *et al.*, 1984; Warwick & Clarke, 1991) the characterisation study was not specifically designed to determine the impacts of sediment contamination on the baseline macrofaunal community and therefore there would be little statistical power in exploring the data with statistical methods.

~~3.1.3.2~~3.1.4.2 A review of the species present at stations with CEFAS exceedances (**Table 5** and **Table 7**) against published sensitivities reported as part of the MarLIN Marine Evidence based Sensitivity Assessment (MarESA) did not provide any additional information on potential impacts on the baseline macrofaunal communities because in most instances detailed studies have not been undertaken on the impacts of sediment contamination at species level. The available scientific literature does not therefore allow a clear attribution of sensitivity levels for a particular species to a given contaminant.

~~3.1.3.3~~3.1.4.3 Whilst there is limited scientific literature to inform the desk based MarESA sensitivity classification, an exploration of the macrofaunal assemblage suggests that there is no obvious geographical trend in the total abundance, diversity, and biomass at stations where threshold exceedances are present when compared to the rest of the offshore ECC and array area (as presented within Section 5.5.2 of **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**). It could be reasonably inferred that key species at stations where threshold exceedances are recorded have a low sensitivity to the level of contamination recorded; a conclusion that is self-evident by the presence of the species despite the environmental conditions. There are no apparent outlier stations that could be attributed to an environmental pressure following review of statistical analysis of the abundance data, which was undertaken as part of the characterisation of the Hornsea Four Order Limits (Section 5.5.2 of **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**) and all biotopes recorded are typical of the wider Southern North Sea region as detailed in Section 10 of **Volume A5, Annex 2.1: Benthic and Intertidal Ecology Technical Report (APP-068)**).

4 Release of sediment bound contaminants

4.1 Introduction

4.1.1.1 This section has collated information for numerous documents provided in the Applicant's DCO Application to provide assurance that significant effects (in EIA terms) will not result from the disturbance of contaminated sediments as a result of Hornsea Four alone or cumulatively. It is the Applicant's position that the findings of the assessments in the

Applicant remain valid and proportionate to the degree of risk. In addition, that no further measures are required.

4.1.1.2 As noted in Section 6.2 of **Volume A4, Annex 4.4: Dredging and Disposal (Site Characterisation) (APP-042)** and **Section 3**, the chemical composition of the material being disturbed and disposed of and concluded that the sediment was considered to be at background levels for the region. As such this Section only considers contaminates either above CAL1 or the ISQG TEL, namely:

- Arsenic;
- ~~•~~ Lead;
- ~~Organotins;~~ and
- PAHs.

4.2 Project alone

4.2.1.1 All samples were below CAL1, it is noted that further consideration is required as per the Guidance (Cefas, 2015 – see **Section 2.1.1**) to ensure the suitability of sediment from this area along the ECC to be disturbed and disposed of in the marine environment. This consideration is provided in this section of this note. The levels of contaminants for the majority of the offshore ECC and the array are all comparable to the wider regional background and not considered to be of a low quality that may result in a significant effect-receptor pathway if made bioavailable.

~~4.2.1.1~~4.2.1.2 A precautionary assessment of the release of EQSD substances was presented in Section 7.2 of **Volume A5, Annex 2.2: Water Framework Directive Assessment (APP-069)**. This assessment, whilst assessing changes in water quality in the designated waterbodies also is explicable to the remainder of the ECC and array. The WFD assessment stated that activities which disturb the seabed have the potential to remobilise contaminants bound in the sediment back into the water environment. Following disturbance as a result of construction activities, the majority of resuspended sediments are expected to be deposited in the immediate vicinity of the works.

~~4.2.1.2 Project specific modelling was undertaken to understand the SSC plume dynamics including lateral and vertical dilution as well as temporal nature of the plumes. The key findings of the modelling are presented in **Volume A2, Chapter 1: Marine Geology, Oceanography and Physical Processes (APP-013)** and are summarised in **Table 7**. The results from the project specific modelling can be used to infer the number and rate of dilutions which would be achieved by any released contaminants as a result of the proposed activities. The release of contaminants, such as arsenic and Polycyclic Aromatic Hydrocarbons (PAHs), are likely to be rapidly dispersed with the tide and/ or currents and therefore increased bioavailability resulting in adverse eco-toxicological effects is not expected. The levels of contaminants within the length of the offshore ECC are all comparable to the wider regional background and not considered to be of a low quality that may result in a significant effect-receptor pathway if made bioavailable.~~

4.2.1.3 ~~In addition, under normal circumstances, very small concentrations of contaminants enter to the dissolved phase, with the vast majority adhering to the sediment particles when temporarily entering suspension in the water column. Partition coefficients may be applied to estimate the concentration of the contaminants entering the dissolves phase which typically result in a reduction of several orders of magnitude than the concentrations associated with suspended sediments.~~ Project specific modelling was undertaken to

understand the SSC plume dynamics including lateral and vertical dilution as well as temporal nature of the plumes. The key findings of the modelling are presented in **Volume A2, Chapter 1: Marine Geology, Oceanography and Physical Processes (APP-013)** and are summarised in **Table 9**. The results from the project specific modelling can be used to infer the number and rate of dilutions which would be achieved by any released contaminants as a result of the proposed activities. The release of contaminants, such as arsenic and PAHs, are likely to be rapidly dispersed with the tide and/ or currents and therefore increased bioavailability resulting in adverse eco-toxicological effects is not expected. It should also be noted that contaminants within the seabed sediments are highly likely to be remobilised during storm events, and as such there will not be a novel or acute introduction of contaminants into the environment beyond natural baseline conditions.

4.2.1.4 In addition, under normal circumstances, very small concentrations of contaminants enter to the dissolved phase, with the vast majority adhering to the sediment particles when temporarily entering suspension in the water column. Partition coefficients may be applied to estimate the concentration of the contaminants entering the dissolves phase which typically result in a reduction of several orders of magnitude than the concentrations associated with suspended sediments.

4.2.1.5 Appendix C presents an assessment of the toxicity of PAHS in the ECC. This assessment is based on the Gorham Test (1998). This test considers benchmark values for seven specific low molecular weight (LMW) (7∑PAH) PAHs, which have 2-3 rings and are acutely toxic, and for six specific heavy molecular weight (HMW) (6∑PAH) PAHs, which have 4-5 rings, are chronically toxic and include carcinogenic PAHs. For the purposes of the current project, ERLs are protective of the environment (< ERL low probability of adverse effects), and therefore lend themselves as potential AL1 benchmarks, whereas ERMs are predictive of harm (> ERM probable adverse effects). As presented in Appendix C, all stations in the ECC are below the ERL for the HMW PAHs. Three stations (ECC19, ECC20 and ECC21) exceed the ERL but do not exceed the ERM. Therefore, probable adverse effects are not anticipated at these stations or elsewhere along the ECC.

4.2.1.6 Therefore, for these reasons the findings of the benthic ecology assessment remains valid. The impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. The magnitude is therefore, considered to be **negligible**. Irrespective of the sensitivity of the receptor, the significance of the impact is **not significant** as defined in the assessment of significance matrix and is therefore not considered further in this assessment. Consequently, it is the Applicant's position that sediments in the Hornsea Four Order Limits are suitable for dredging and disposal.

Table 9: Temporary increases in SSC and sediment deposition as a result of construction activities at Hornsea Four.

Construction Impact	Location	Maximum sediment plume distance	Details of increase in SSC and deposition
Sandwave clearance	Nearshore ECC / cable crossing	10 km (springs) and 6 km (neaps)/ 14 km (springs) and 6 km (neaps)	• SSCs within sediment plumes associated with overspill can be in the order of hundreds of mg/l in the vicinity of the dredger, reducing to tens of mg/l with distance, but also quickly dissipating in time after release; • The deposition of fine sediment under low flow conditions is predicted to be less than 2 mm from overspill; • Dredge spoil disposal plume concentrations remain less than 10 mg/l for all locations 2 km beyond the point of release and are not detectable after about 20 hours; and • The depth of spoil deposition (for all sediments) is typically very small (around 0.1 mm) but reaches 5.9 cm for the spring tide in a confined area and 10 cm for a neap release. These depths of deposition cover a very small area and are due to coarser grained sediments (gravels).
Offshore trenching for cables	Offshore ECC	4 km along the axis of the tide	• Within 5 m of trenching very high plume concentrations are expected. SSC could be millions of mg/l. This is only expected to occur while the CFE is active; • At 2 km from the source, the silt content will be approximately 100 mg/l during the trenching period and will fully dissipate and will fully dissipate after around 65 hours; and • The maximum depth of deposition is 0.1 m to 0.12 m within the cable crossing area and 0.13 m to 0.14 m within the inshore cable route. The maximum settlement depth reduces exponentially in range from the trench reaching 0.12 m at 50 m and 0.06 m at 100 m, for a 6 m^2 trench.

4.3 Cumulative effects assessment

4.3.1.1 As presented in Section 4.2, the levels of contaminants within the Hornsea Four Order Limits are all comparable to the wider regional background and not considered to be of a low quality that may result in a significant effect if made bioavailable. The vast majority of contaminants will adhere to the sediment particles when temporarily entering suspension in the water column.

4.3.1.2 Rapid dispersion and high dilution of contaminants will occur. Therefore, in the unlikely event that sediment plumes from two projects overlap the concentrations of released contaminants, whilst additive, will not be discernible from background levels. Therefore, the

of the cumulative impact on benthic ecology is therefore **negligible**. Irrespective of the sensitivity of the receptors, the significance of the cumulative impact **not significant** as defined in the assessment of significance matrix. Therefore, this assessment was not presented in the Applicant's EIA.

5 Conclusions

5.1.1.1 This clarification note has been prepared to provide a detailed response to the Relevant Representations made by the MMO and Natural England and provide additional assurance for issues raised by representations during the examination process. This note aims to provide sufficient information to provide confidence for the regulators that the potential for the release of contaminants in the marine environment has been adequately considered in the Applicant's DCO Application.

5.1.1.2 This note has sought to collate information from the relevant DCO Application documents to provide a summary of the information presented within. The collated information is intended to provide the MMO and Natural England with sufficient information to provide sufficient comfort that sediment bound contaminants are not a matter for concern. Furthermore, that the sediment within the draft Order Limits is appropriate for dredging and disposal.

5.1.1.3 It is the Applicant's position that the findings of the assessments in the Applicant remain valid and proportionate to the degree of risk. In addition, that no further measures are required. Importantly the evidence provided allows a conclusion to be drawn that there is a very low risk of a significant effect arising, on a faunal assemblage that is evidently not sensitive to the contaminants presence in the baseline environment.

6 References

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Appendix A - Certificate of Analysis for polycyclic aromatic hydrocarbons in the array

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00130
Issue Version	2
Customer Reference	11210

						Client Reference:	11210 ENV1	11210 ENV2	11210 ENV4	11210 ENV5
						SOCOTEC Ref:	MAR00130_001	MAR00130_002	MAR00130_003	MAR00130_004
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	2.01	<1
C1 Naphthalenes	142	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.62	3.77	6.99	1.70
C2 Naphthalenes	156	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.02	5.28	8.71	1.95
C3 Naphthalenes	170	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.26	5.83	8.39	2.93
C4 Naphthalenes	184	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.66	4.13	5.43	2.31
Sum Naphthalenes	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	7.56	19.0	31.5	8.89
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	1.22	2.57	4.87	1.82
C1 178	192	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.15	4.04	6.68	2.67
C2 178	206	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.40	4.38	8.29	3.20
C3 178	220	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.19	3.29	3.69	2.23
Sum 178	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	6.96	14.3	23.5	9.91
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.52	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.54	1.72	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.03	1.70	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	0.00	2.57	4.94	0.00
Fluoranthene / pyrene	202	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	3.03	5.72	9.58	5.99
C1 202	216	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.06	4.16	6.60	3.25
C2 202	230	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.01	4.71	6.51	3.42
C3 202	244	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.39	3.62	4.86	2.46
Sum 202	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	8.50	18.2	27.5	15.1
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	1.15	3.63	5.56	3.53
C1 228	242	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.40	2.51	4.09	2.14
C2 228	256	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.64	3.91	1.92
Sum 228	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	2.55	8.78	13.6	7.59
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	2.83	5.87	13.0	5.59
C1 252	266	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.04	3.86	6.75	2.85
C2 252	280	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.20	2.79	4.55	2.25
Sum 252	-	N	ASC/SOP/303	6	µg/Kg (Dry Weight)	15&16/10/2018	6.07	12.5	24.3	10.7
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303	3	µg/Kg (Dry Weight)	15&16/10/2018	3.04	3.86	8.91	3.31
C1 276	290	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	2.74	<1
C2 276	304	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.20	2.79	4.55	2.25
Sum 276	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	4.24	6.65	16.21	5.56
Sum of all fractions	-	N	ASC/SOP/303	34	µg/Kg (Dry Weight)	15&16/10/2018	35.9	82.0	142	57.8
Sum of NPD fraction	-	N	ASC/SOP/303	14	µg/Kg (Dry Weight)	15&16/10/2018	14.5	35.9	60.0	18.8
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303	-	µg/Kg (Dry Weight)	15&16/10/2018	0.68	0.78	0.74	0.48

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00130
Issue Version	2
Customer Reference	11210

						Client Reference:	11210 ENV6	11210 ENV8	11210 ENV9	11210 ENV10	11210 ENV11	11210 ENV14	11210 ENV15	Reference Material (% Recovery)
						SOCOTEC Ref:	MAR00130_005	MAR00130_006	MAR00130_007	MAR00130_008	MAR00130_009	MAR00130_010	MAR00130_011	
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.00	1.75	1.82	<1	<1	2.08	99
C1 Naphthalenes	142	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.61	3.76	5.93	6.46	3.04	3.42	6.97	102
C2 Naphthalenes	156	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	3.16	4.58	6.97	7.37	3.39	3.45	7.60	N.D
C3 Naphthalenes	170	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	3.69	3.96	7.38	8.88	3.06	3.17	7.84	N.D
C4 Naphthalenes	184	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.06	2.31	4.37	4.72	1.77	1.84	3.74	N.D
Sum Naphthalenes	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	11.5	15.6	26.4	29.3	11.3	11.9	28.2	101
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	1.89	2.30	4.20	4.04	1.91	1.83	4.38	101
C1 178	192	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.66	3.00	5.67	6.03	2.54	2.33	5.86	N.D
C2 178	206	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	3.05	3.56	6.35	7.85	3.25	2.92	6.92	N.D
C3 178	220	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.99	2.53	3.69	5.20	1.45	1.32	4.01	N.D
Sum 178	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	9.59	11.4	19.9	23.1	9.15	8.41	21.2	101
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	98
C1 Dibenzothiophenes	198	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.14	1.09	<1	<1	<1	N.D
C2 Dibenzothiophenes	212	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.56	1.30	<1	<1	1.07	N.D
C3 Dibenzothiophenes	226	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.14	1.41	<1	<1	<1	N.D
Sum Dibenzothiophenes	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	0.00	0.00	3.85	3.80	0.00	0.00	1.07	98
Fluoranthene / pyrene	202	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	3.72	4.76	8.34	9.55	5.04	3.80	8.78	101
C1 202	216	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.49	3.02	5.69	6.43	2.64	2.50	5.24	N.D
C2 202	230	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.56	2.97	5.77	7.22	2.82	2.61	5.56	N.D
C3 202	244	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.74	2.21	3.98	5.54	1.96	1.66	3.94	N.D
Sum 202	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	10.5	13.0	23.8	28.7	12.5	10.6	23.5	101
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	1.52	3.00	5.13	6.86	2.92	1.47	6.25	103
C1 228	242	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.56	2.35	3.97	5.51	2.24	1.76	4.44	N.D
C2 228	256	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.63	2.00	3.14	6.10	1.75	1.60	3.75	N.D
Sum 228	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	4.71	7.34	12.2	18.5	6.91	4.82	14.4	103
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	3.71	8.70	13.4	17.4	8.35	7.37	17.2	103
C1 252	266	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.81	4.43	6.38	9.93	4.17	3.73	8.89	N.D
C2 252	280	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.00	3.27	3.85	6.51	2.21	2.16	6.48	N.D
Sum 252	-	N	ASC/SOP/303	6	µg/Kg (Dry Weight)	15&16/10/2018	8.52	16.4	23.6	33.8	14.7	13.3	32.5	103
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303	3	µg/Kg (Dry Weight)	15&16/10/2018	3.66	6.40	9.47	12.5	6.46	5.64	14.2	105
C1 276	290	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.02	1.69	2.19	3.01	1.66	1.12	3.55	N.D
C2 276	304	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.00	3.27	3.85	6.51	2.21	2.16	6.48	N.D
Sum 276	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	6.67	11.4	15.5	22.1	10.3	8.92	24.2	105
Sum of all fractions	-	N	ASC/SOP/303	34	µg/Kg (Dry Weight)	15&16/10/2018	51.5	75.1	125	159	64.9	57.9	145	102
Sum of NPD fraction	-	N	ASC/SOP/303	14	µg/Kg (Dry Weight)	15&16/10/2018	21.1	27.0	50.1	56.2	20.4	20.3	50.4	100
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303	-	µg/Kg (Dry Weight)	15&16/10/2018	0.69	0.56	0.67	0.55	0.46	0.54	0.53	101

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00130
Issue Version	2
Customer Reference	11210

						Client Reference:	QC Blank	11210 ENV16	11210 ENV17	11210 ENV18	11210 ENV19	11210 ENV20	11210 ENV21	11210 ENV22
						SOCOTEC Ref:		MAR00130_012	MAR00130_013	MAR00130_014	MAR00130_015	MAR00130_016	MAR00130_017	MAR00130_018
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.43	4.85	<1	2.39	<1	1.68	1.24
C1 Naphthalenes	142	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	7.76	16.0	1.40	7.65	2.39	5.41	4.07
C2 Naphthalenes	156	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	8.25	15.7	1.80	9.05	2.48	5.96	4.40
C3 Naphthalenes	170	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	8.50	13.0	1.58	8.84	2.41	5.15	3.90
C4 Naphthalenes	184	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.85	6.23	<1	3.67	1.45	2.45	1.98
Sum Naphthalenes	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	<5	30.8	55.7	4.78	31.6	8.73	20.6	15.6
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	<2	4.80	8.91	0.00	4.69	1.25	2.99	2.34
C1 178	192	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	6.33	10.4	1.04	6.22	1.64	3.92	3.06
C2 178	206	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	7.18	11.7	1.17	7.13	1.90	4.85	4.03
C3 178	220	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.16	4.94	<1	4.95	<1	2.20	1.84
Sum 178	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	<5	21.5	35.9	2.21	23.0	4.79	14.0	11.3
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.15	1.70	<1	1.01	<1	<1	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.28	1.82	<1	1.22	<1	1.04	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.21	1.68	<1	1.27	<1	<1	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	<4	3.65	5.20	0.00	3.50	0.00	1.04	0.00
Fluoranthene / pyrene	202	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	<2	8.80	14.1	0.00	9.54	2.43	6.82	5.59
C1 202	216	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.71	9.20	<1	5.63	1.61	3.60	2.83
C2 202	230	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.78	9.69	<1	6.13	1.89	3.76	3.05
C3 202	244	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	4.75	6.81	<1	4.57	1.04	2.77	2.32
Sum 202	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	<5	25.0	39.8	0.00	25.9	6.96	17.0	13.8
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	<2	6.26	9.99	0.00	6.26	1.01	4.32	3.75
C1 228	242	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	4.62	7.60	<1	4.62	1.32	2.99	2.66
C2 228	256	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	4.12	5.60	<1	3.89	1.37	2.45	2.19
Sum 228	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	<4	15.0	23.2	0.00	14.8	3.71	9.77	8.59
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	<4	16.7	29.0	0.00	18.6	3.04	12.5	11.4
C1 252	266	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	8.65	14.2	1.73	9.42	2.80	5.87	5.23
C2 252	280	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.65	8.42	1.16	6.71	1.56	3.54	3.07
Sum 252	-	N	ASC/SOP/303	6	µg/Kg (Dry Weight)	15&16/10/2018	<6	31.0	51.6	2.88	34.7	7.40	21.9	19.7
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303	3	µg/Kg (Dry Weight)	15&16/10/2018	<3	13.6	22.9	2.23	15.8	3.73	9.64	8.89
C1 276	290	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.08	5.61	<1	3.30	<1	2.19	2.11
C2 276	304	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.65	8.42	1.16	6.71	1.56	3.54	3.07
Sum 276	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	<5	22.4	36.9	3.39	25.8	5.29	15.4	14.1
Sum of all fractions	-	N	ASC/SOP/303	34	µg/Kg (Dry Weight)	15&16/10/2018	<34	149	248	13	159	36.9	100	83.0
Sum of NPD fraction	-	N	ASC/SOP/303	14	µg/Kg (Dry Weight)	15&16/10/2018	<14	55.9	96.8	7	58.1	14	36	27
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303	-	µg/Kg (Dry Weight)	15&16/10/2018	-	0.60	0.64	1.11	0.57	0.58	0.56	0.48

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00130
Issue Version	2
Customer Reference	11210

						Client Reference:	11210 ENV23	11210 ENV24	11210 ENV25	11210 ENV25 DUP	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:	MAR00130_019	MAR00130_020	MAR00130_021	MAR00130_022		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment		
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.43	<1	<1	104	<1
C1 Naphthalenes	142	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.99	5.49	2.75	2.58	102	<1
C2 Naphthalenes	156	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.18	8.63	2.74	2.65	N.D	<1
C3 Naphthalenes	170	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.83	8.97	2.53	2.71	N.D	<1
C4 Naphthalenes	184	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.30	1.12	1.36	N.D	<1
Sum Naphthalenes	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	6.00	27.8	9.15	9.30	103	<5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	1.06	6.10	1.51	1.43	102	<2
C1 178	192	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.33	7.38	1.81	1.79	N.D	<1
C2 178	206	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.44	5.96	1.85	1.82	N.D	<1
C3 178	220	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.48	1.12	1.09	N.D	<1
Sum 178	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	3.82	22.9	6.29	6.13	102	<5
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	100	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	N.D	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	N.D	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	N.D	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	0.00	0.00	0.00	0.00	100	<4
Fluoranthene / pyrene	202	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	0.00	4.37	2.41	2.60	102	<2
C1 202	216	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.19	3.59	1.54	1.59	N.D	<1
C2 202	230	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.20	5.28	1.64	1.73	N.D	<1
C3 202	244	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.01	3.66	1.30	1.02	N.D	<1
Sum 202	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	3.39	16.9	6.88	6.94	102	<5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303	2	µg/Kg (Dry Weight)	15&16/10/2018	0.00	3.37	1.06	1.01	99	<2
C1 228	242	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.91	1.27	1.24	N.D	<1
C2 228	256	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.26	1.23	1.18	N.D	<1
Sum 228	-	N	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	0.00	9.54	3.57	3.42	99	<4
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303	4	µg/Kg (Dry Weight)	15&16/10/2018	0.00	6.39	3.08	3.52	97	<4
C1 252	266	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.85	4.30	2.26	2.54	N.D	<1
C2 252	280	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.33	3.76	1.86	1.62	N.D	<1
Sum 252	-	N	ASC/SOP/303	6	µg/Kg (Dry Weight)	15&16/10/2018	3.18	14.4	7.21	7.67	97	<6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303	3	µg/Kg (Dry Weight)	15&16/10/2018	1.12	6.15	3.71	3.71	96	<3
C1 276	290	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.12	<1	<1	N.D	<1
C2 276	304	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.33	3.76	1.86	1.62	N.D	<1
Sum 276	-	N	ASC/SOP/303	5	µg/Kg (Dry Weight)	15&16/10/2018	2.46	11.0	5.57	5.33	96	<5
Sum of all fractions	-	N	ASC/SOP/303	34	µg/Kg (Dry Weight)	15&16/10/2018	19	103	38.7	38.8	100	<34
Sum of NPD fraction	-	N	ASC/SOP/303	14	µg/Kg (Dry Weight)	15&16/10/2018	10	50.7	15	15	102	<14
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303	-	µg/Kg (Dry Weight)	15&16/10/2018	1.09	0.98	0.66	0.66	108	-

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00130
Issue Version 2
Customer Reference 11210

						Client Reference:	11210 ENV1	11210 ENV2	11210 ENV4	11210 ENV5
						SOCOTEC Ref:	MAR00130_001	MAR00130_002	MAR00130_003	MAR00130_004
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	2.01	<1
Acenaphthylene	152	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Phenanthrene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.22	2.57	4.87	1.82
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Fluoranthene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.72	3.26	5.39	3.64
Pyrene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.30	2.46	4.19	2.35
Benzo[a]anthracene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.12	2.14	1.25
Chrysene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.15	2.51	3.42	2.27
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.51	2.65	4.80	2.64
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.89	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.32	2.19	3.87	1.95
Benzo[a]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.04	2.40	1.00
Perylene	252	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.37	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.45	1.51	4.12	1.54
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.59	2.35	4.79	1.78

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00130
Issue Version 2
Customer Reference 11210

						Client Reference:	11210 ENV6	11210 ENV8	11210 ENV9	11210 ENV10	11210 ENV11	11210 ENV14	11210 ENV15	Reference Material (% Recovery)
						SOCOTEC Ref:	MAR00130_005	MAR00130_006	MAR00130_007	MAR00130_008	MAR00130_009	MAR00130_010	MAR00130_011	
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.00	1.75	1.82	<1	<1	2.08	99
Acenaphthylene	152	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	105
Acenaphthene	154	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	109
Fluorene	166	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	105
Phenanthrene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.89	2.30	4.20	4.04	1.91	1.83	4.38	102
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	98
Anthracene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1	99
Fluoranthene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.13	2.74	4.59	5.18	2.87	2.14	4.99	100
Pyrene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.59	2.02	3.75	4.36	2.17	1.66	3.79	101
Benzo[a]anthracene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.18	1.90	2.76	1.16	<1	2.51	102
Chrysene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.52	1.82	3.23	4.10	1.76	1.47	3.74	104
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.13	3.49	4.85	6.04	3.20	2.83	6.80	97
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.26	2.04	2.70	1.19	1.18	2.30	107
Benzo[e]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.58	2.43	4.00	5.18	2.42	2.11	4.89	100
Benzo[a]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.52	2.53	3.44	1.55	1.25	3.20	110
Perylene	252	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.43	1.64	<1	<1	1.55	109
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.66	3.13	4.55	6.04	3.20	2.83	6.52	107
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	1.16	104
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.00	3.27	4.91	6.50	3.26	2.81	6.50	105

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00130
Issue Version 2
Customer Reference 11210

						Client Reference:	QC Blank	11210 ENV16	11210 ENV17	11210 ENV18	11210 ENV19	11210 ENV20	11210 ENV21
						SOCOTEC Ref:		MAR00130_012	MAR00130_013	MAR00130_014	MAR00130_015	MAR00130_016	MAR00130_017
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted		Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.43	4.85	<1	2.39	<1	1.68
Acenaphthylene	152	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.23	<1	<1	<1	<1
Phenanthrene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	4.80	7.82	<1	4.69	1.25	2.99
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	1.09	<1	<1	<1	<1
Fluoranthene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	4.86	7.80	<1	5.32	1.37	3.93
Pyrene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.95	6.34	<1	4.22	1.06	2.90
Benzo[a]anthracene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.39	3.94	<1	2.49	<1	1.76
Chrysene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.86	6.05	<1	3.77	1.01	2.57
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.89	10.2	<1	7.39	1.69	4.96
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	2.57	5.04	<1	2.46	<1	1.64
Benzo[e]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	5.09	8.40	<1	5.32	1.34	3.59
Benzo[a]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	3.12	5.28	<1	3.39	<1	2.34
Perylene	252	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.52	3.00	<1	1.93	<1	1.09
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	6.18	10.5	1.13	7.33	1.82	4.89
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	1.03	1.80	<1	1.27	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	6.43	10.6	1.10	7.17	1.91	4.75

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00130
Issue Version 2
Customer Reference 11210

						Client Reference:	11210 ENV22	11210 ENV23	11210 ENV24	11210 ENV25	11210 ENV25 DUP	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:	MAR00130_018	MAR00130_019	MAR00130_020	MAR00130_021	MAR00130_022		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment		
Naphthalene	128	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.24	<1	1.43	<1	<1	104	<1
Acenaphthylene	152	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	99	<1
Acenaphthene	154	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	100	<1
Fluorene	166	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	100	<1
Phenanthrene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.34	1.06	6.10	1.51	1.43	103	<1
Dibenzothiophene	184	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	100	<1
Anthracene	178	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	101	<1
Fluoranthene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	3.20	<1	2.37	1.30	1.43	102	<1
Pyrene	202	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.39	<1	2.00	1.11	1.17	102	<1
Benzo[a]anthracene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.49	<1	1.15	<1	<1	97	<1
Chrysene	228	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.26	<1	2.22	1.06	1.01	102	<1
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	4.24	<1	2.59	1.69	2.13	95	<1
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	1.78	<1	<1	<1	<1	103	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	3.33	<1	2.47	1.40	1.38	92	<1
Benzo[a]pyrene	252	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	2.03	<1	1.33	<1	<1	97	<1
Perylene	252	N	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	97	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	4.53	<1	2.88	1.92	1.81	96	<1
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	<1	<1	<1	<1	<1	95	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303	1	µg/Kg (Dry Weight)	15&16/10/2018	4.36	1.12	3.27	1.79	1.90	96	<1

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Appendix B - Certificate of Analysis for polycyclic aromatic hydrocarbons in the export cable corridor

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	**MAR00309**
Issue Version	2
Customer	Benthic Solutions Limited, Greengates Way, Hoveton, Norfolk, NR12 8ED
Customer Reference	BSL-1908 Orsted HOW3 & 4
Date Sampled	06-10-Jun-19
Date Received	20-Jun-19
Date Reported	06-Aug-19
Condition of samples	Frozen Satisfactory

This is a revised report containing the additional Lithium data and replaces all previously issued versions.

Authorised by: Marya Hubbard

Position: Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_01	ECC_02	ECC_03	ECC_04	ECC_05	ECC_06
					SOCOTEC Ref:	MAR00309.001	MAR00309.002	MAR00309.003	MAR00309.004	MAR00309.005	MAR00309.006
Accreditation	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	**Matrix:**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	01-03/07/19	**Total Moisture @ 120°C**	21.0	22.0	24.3	23.4	25.2	24.1

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_07	ECC_08	ECC_09	ECC_10	ECC_11	ECC_12
					SOCOTEC Ref:	MAR00309.007	MAR00309.008	MAR00309.009	MAR00309.010	MAR00309.011	MAR00309.012
Accreditation	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	**Matrix:**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	01-03/07/19	**Total Moisture @ 120°C**	25.6	24.1	23.7	23.8	24.6	22.2

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_13	ECC_14	ECC_15	ECC_16	ECC_17	ECC_18
					SOCOTEC Ref:	MAR00309.013	MAR00309.014	MAR00309.015	MAR00309.016	MAR00309.017	MAR00309.018
Accreditation	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	**Matrix:**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	01-03/07/19	**Total Moisture @ 120°C**	21.4	23.4	23.4	24.0	21.6	24.0

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_19	ECC_20	ECC_21	ECC_23	ECC_24	ECC_25
					SOCOTEC Ref:	MAR00309.019	MAR00309.020	MAR00309.021	MAR00309.022	MAR00309.023	MAR00309.024
Accreditation	Method No	Limit of Detection	Units	Date Extracted	Matrix:	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	01-03/07/19	Total Moisture @ 120°C	24.2	25.4	26.0	20.4	23.4	22.8

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_26	ECC_27
					SOCOTEC Ref:	MAR00309.025	MAR00309.026
Accreditation	Method No	Limit of Detection	Units	Date Extracted	Matrix:	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	01-03/07/19	Total Moisture @ 120°C	22.4	24.0

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00310
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	L8_B1_G01	L8_B1_G02	L8_B2_G03	L8_B3_G04	L8_B4_G05	L8_B5_G06	L8_B6_G07
					SOCOTEC Ref:	MAR00310.001	MAR00310.002	MAR00310.003	MAR00310.004	MAR00310.005	MAR00310.006	MAR00310.007
Accreditation	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	**Matrix:**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	28/06/2019	**Total Moisture @ 120°C**	20.4	22.8	24.4	23.4	21.0	25.6	23.8

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00311
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	L5_B1_G01	L5_B2_G02	L5_B3_G03	L5_B4A_G04	L5_B4B_G05
					SOCOTEC Ref:	MAR00311.001	MAR00311.002	MAR00311.003	MAR00311.004	MAR00311.005
Accreditation	Method No	Limit of Detection	Units	Date Extracted	Matrix:	Sediment	Sediment	Sediment	Sediment	Sediment
UKAS	ASC/SOP/303	0.2	%	28/06/2019	Total Moisture @ 120°C	21.6	18.2	16.2	23.6	19.8

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.04	0.5	0.5	0.5	0.015	0.5
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**
ECC_01	MAR00309.001	Sediment	5.6	<0.04	6.9	5.0	5.1	<0.015	3.8
ECC_02	MAR00309.002	Sediment	8.9	<0.04	8.1	4.6	5.7	<0.015	4.3
ECC_03	MAR00309.003	Sediment	4.2	<0.04	7.1	5.6	5.5	<0.015	3.7
ECC_04	MAR00309.004	Sediment	3.7	<0.04	6.8	5.3	5.6	<0.015	3.8
ECC_05	MAR00309.005	Sediment	4.9	<0.04	8.1	6.0	6.9	<0.015	4.6
ECC_06	MAR00309.006	Sediment	5.4	0.05	8.8	6.2	7.9	0.06	4.9
ECC_07	MAR00309.007	Sediment	4.6	0.04	7.0	5.4	7.1	<0.015	3.9
ECC_08	MAR00309.008	Sediment	5.4	0.06	7.9	7.0	7.8	<0.015	4.6
ECC_09	MAR00309.009	Sediment	7.8	<0.04	9.7	6.3	8.3	<0.015	5.3
ECC_10	MAR00309.010	Sediment	6.4	<0.04	8.6	5.5	8.6	<0.015	4.6
ECC_11	MAR00309.011	Sediment	5.3	0.07	6.7	6.0	7	<0.015	3.8
ECC_12	MAR00309.012	Sediment	9.4	<0.04	7.2	4.8	7.6	<0.015	3.9
ECC_13	MAR00309.013	Sediment	6	0.05	8.0	6.7	7.7	0.03	4.2
ECC_14	MAR00309.014	Sediment	48.7	0.13	10.3	5.6	20.7	<0.015	9.4
ECC_15	MAR00309.015	Sediment	18.7	0.06	9.6	4.8	15.7	<0.015	4.9
ECC_16	MAR00309.016	Sediment	20.2	<0.04	9.5	5.5	18.8	<0.015	6.1
ECC_17	MAR00309.017	Sediment	37	0.04	12.0	5.6	35.6	<0.015	7.5
ECC_18	MAR00309.018	Sediment	38	0.08	14.4	7.2	25.3	<0.015	10.8
ECC_19	MAR00309.019	Sediment	24	0.13	17.0	11.5	41.9	0.03	13.3
Certified Reference Material SETOC 774 (% Recovery)			101	99	95	98	103	94	106
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.5	<0.015	<0.5

* See Report Notes
~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	% M/M
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.5	2	10	2	0.02
		Accreditation	N	N	UKAS	N	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Tin (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Aluminium**	**Lithium**	**Total Organic Carbon**
ECC_01	MAR00309.001	Sediment	<0.5	15.9	17.9	1940	4.6	0.13
ECC_02	MAR00309.002	Sediment	<0.5	23.2	23.3	1840	4.2	0.09
ECC_03	MAR00309.003	Sediment	<0.5	14.8	22.6	1770	4.0	0.12
ECC_04	MAR00309.004	Sediment	<0.5	13.6	22.3	1690	4.1	0.14
ECC_05	MAR00309.005	Sediment	<0.5	16.1	21.1	1950	4.4	0.16
ECC_06	MAR00309.006	Sediment	<0.5	17.2	19.7	2080	4.6	0.15
ECC_07	MAR00309.007	Sediment	<0.5	14.9	36.7	1700	4.0	0.16
ECC_08	MAR00309.008	Sediment	<0.5	16.0	33.8	1930	4.6	0.18
ECC_09	MAR00309.009	Sediment	<0.5	22.4	25.9	2160	5.1	0.18
ECC_10	MAR00309.010	Sediment	<0.5	18.0	22.3	1880	4.3	0.17
ECC_11	MAR00309.011	Sediment	<0.5	15.0	22.9	1680	4.0	0.14
ECC_12	MAR00309.012	Sediment	<0.5	19.4	16.4	1610	4.0	0.11
ECC_13	MAR00309.013	Sediment	<0.5	16.7	19.9	1680	3.7	0.11
ECC_14	MAR00309.014	Sediment	<0.5	53.7	32.7	2860	9.3	0.29
ECC_15	MAR00309.015	Sediment	<0.5	29.0	29.2	1500	4.7	0.09
ECC_16	MAR00309.016	Sediment	<0.5	33.4	31.6	1760	5.3	0.17
ECC_17	MAR00309.017	Sediment	<0.5	54.8	35.2	2310	6.4	0.15
ECC_18	MAR00309.018	Sediment	0.5	50.4	43.8	3900	13.1	0.49
ECC_19	MAR00309.019	Sediment	1.0	50.0	68.2	5960	22.0	1.12
Certified Reference Material SETOC 774 (% Recovery)			104~	97	96	102~	104~	99~
QC Blank			<0.5	<0.5	<2	<10	<2	<0.02

* See Report Notes
~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.04	0.5	0.5	0.5	0.015	0.5
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**
ECC_20	MAR00309.020	Sediment	23.3	<0.04	13.2	8.9	19	0.02	12.8
ECC_21	MAR00309.021	Sediment	15.8	0.06	20.1	15.7	24.3	0.03	20.1
ECC_23	MAR00309.022	Sediment	23.3	0.06	6.9	6.6	9.2	<0.015	9.6
ECC_24	MAR00309.023	Sediment	17.2	<0.04	8.5	6.6	17.7	<0.015	7.5
ECC_25	MAR00309.024	Sediment	15.4	<0.04	7.5	7.2	20.5	0.04	7.3
ECC_26	MAR00309.025	Sediment	12.7	<0.04	7.2	6.7	18.7	0.05	6.5
ECC_27	MAR00309.026	Sediment	14.1	<0.04	7.8	6.6	16.9	0.1	6.6
		Certified Reference Material SETOC 774 (% Recovery)	96	96	99	107	97	89	100
		QC Blank	<0.5	<0.04	<0.5	<0.5	<0.5	<0.015	<0.5

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	% M/M
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.5	2	10	2	0.02
		Accreditation	N	N	UKAS	N	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Tin (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Aluminium**	**Lithium**	**Total Organic Carbon**
ECC_20	MAR00309.020	Sediment	1.0	37.1	48.8	6040	19.9	0.96
ECC_21	MAR00309.021	Sediment	1.9	40.4	63.0	9890	34.6	0.88
ECC_23	MAR00309.022	Sediment	1.1	29.0	34.5	3180	10.9	0.22
ECC_24	MAR00309.023	Sediment	1.0	29.2	43.6	2100	5.8	0.15
ECC_25	MAR00309.024	Sediment	1.0	25.9	37.3	2190	6.6	0.16
ECC_26	MAR00309.025	Sediment	0.9	21.0	38.6	2120	5.8	0.13
ECC_27	MAR00309.026	Sediment	0.9	23.0	35.8	2190	5.8	0.12
Certified Reference Material SETOC 774 (% Recovery)			99~	100	102	103~	104~	100~
QC Blank			<0.5	<0.5	<2	<10	<2	<0.02

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00310
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.004	0.5	0.5	0.5	0.015	0.5
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**
L8_B1_G01	MAR00310.001	Sediment	16.4	0.11	6.2	8.1	14.3	<0.015	5.3
L8_B1_G02	MAR00310.002	Sediment	7.6	0.05	7	7.3	5.4	<0.015	6.4
L8_B2_G03	MAR00310.003	Sediment	14.3	0.06	7.6	5.4	7.5	<0.015	6
L8_B3_G04	MAR00310.004	Sediment	13.1	<0.04	5.6	6.2	6.3	<0.015	4.5
L8_B4_G05	MAR00310.005	Sediment	25.7	0.07	7.8	6.4	9.3	<0.015	7.9
L8_B5_G06	MAR00310.006	Sediment	12.2	0.14	14.9	15.0	11.1	0.06	18.2
L8_B6_G07	MAR00310.007	Sediment	17.9	0.08	13.7	11.0	9.2	<0.015	15.3
Certified Reference Material 2702 (% Recovery)			100	99	103	98	100	95	101
QC Blank			<0.5	<0.004	<0.5	<0.5	<0.5	<0.015	<0.5

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00310
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	%M/M
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	0.5	0.5	2	10	2	10	0.02
		Accreditation	N	N	UKAS	N	N	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Tin**	**Vanadium**	**Zinc**	**Aluminium**	**Lithium**	**TPH by GCFID**	**Total Organic Carbon**
L8_B1_G01	MAR00310.001	Sediment	<0.5	20.4	29.5	1500	4.0	27	0.09
L8_B1_G02	MAR00310.002	Sediment	<0.5	15.0	23.6	2410	6.9	45	0.22
L8_B2_G03	MAR00310.003	Sediment	<0.5	24.3	23.3	1990	5.7	39	0.22
L8_B3_G04	MAR00310.004	Sediment	<0.5	16.9	24.9	1360	3.1	32	0.14
L8_B4_G05	MAR00310.005	Sediment	<0.5	27.9	27.2	3240	9.9	33	0.35
L8_B5_G06	MAR00310.006	Sediment	<0.5	27.2	39.2	7520	25.3	37	0.51
L8_B6_G07	MAR00310.007	Sediment	<0.5	37.6	49.7	5810	17.4	33	0.24
Certified Reference Material 2702 (% Recovery)			100~	98	103	95~	102~	103~	100~
QC Blank			<0.5	<0.5	<2	<10	<2	<10	<0.02

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00311
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS
		Limit of Detection	0.5	0.04	0.5	0.5	0.5	0.015	0.5
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**
L5_B1_G01	MAR00311.001	Sediment	8.8	<0.04	7.7	6.0	5.4	<0.015	4.8
L5_B2_G02	MAR00311.002	Sediment	7.6	0.06	9.0	9.1	7.8	<0.015	7.8
L5_B3_G03	MAR00311.003	Sediment	15.2	<0.04	8.7	6.5	6.0	<0.015	5.7
L5_B4A_G04	MAR00311.004	Sediment	18.2	0.11	14.7	10.0	7.2	<0.015	14.8
L5_B4B_G05	MAR00311.005	Sediment	24.8	0.09	16.8	10.4	7.1	<0.015	19.7
Certified Reference Material 2702 (% Recovery)			100	99	103	98	100	95	101
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.5	<0.015	<0.5

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00311
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	%M/M
		Method No	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	TPHFIDUS	WSLM59
		Limit of Detection	0.5	0.5	2	10	2	10	0.02
		Accreditation	N	N	UKAS	N	N	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Tin**	**Vanadium**	**Zinc**	**Aluminium**	**Lithium**	**TPH by GCFID**	**Total Organic Carbon**
L5_B1_G01	MAR00311.001	Sediment	<0.5	19.1	23.4	1770	4	31	0.13
L5_B2_G02	MAR00311.002	Sediment	<0.5	20.6	24.3	2720	8	36	0.33
L5_B3_G03	MAR00311.003	Sediment	<0.5	29.3	23.6	1630	3	30	0.06
L5_B4A_G04	MAR00311.004	Sediment	<0.5	33.9	41.7	5550	17	28	0.19
L5_B4B_G05	MAR00311.005	Sediment	<0.5	44.3	43.9	5420	16	25	0.11
Certified Reference Material 2702 (% Recovery)			100~	98	103	95~	102~	103~	100~
QC Blank			<0.5	<0.5	<2	<10	<2	<10	<0.02

* See Report Notes
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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_01	ECC_02	ECC_03	ECC_04	ECC_05
					SOCOTEC Ref:	MAR00309.001	MAR00309.002	MAR00309.003	MAR00309.004	MAR00309.005
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<5	<5	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<5	<5	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<5	<5	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_06	ECC_07	ECC_08	ECC_09	ECC_10
					SOCOTEC Ref:	MAR00309.006	MAR00309.007	MAR00309.008	MAR00309.009	MAR00309.010
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_11	Reference Material (% Recovery)	QC Blank
					SOCOTEC Ref:	MAR00309.011		
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment		
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	86	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	89	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	132	<1

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Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_12	ECC_13	ECC_14	ECC_15	ECC_16	ECC_17
					SOCOTEC Ref:	MAR00309.012	MAR00309.013	MAR00309.014	MAR00309.015	MAR00309.016	MAR00309.017
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<5	<1	<1	<1	<1	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<5	<1	<1	<1	<1	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<5	<1	<1	<1	<1	<1

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Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_18	ECC_19	ECC_20	ECC_21	ECC_23	ECC_24
					SOCOTEC Ref:	MAR00309.018	MAR00309.019	MAR00309.020	MAR00309.021	MAR00309.022	MAR00309.023
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_25	ECC_26	ECC_27	Reference Material (% Recovery)	QC Blank
					SOCOTEC Ref:	MAR00309.024	MAR00309.025	MAR00309.026		
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment		
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	90	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	94	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	177	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00310
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	L8_B1_G01	L8_B1_G02	L8_B2_G03	L8_B3_G04	L8_B4_G05	L8_B5_G06
					SOCOTEC Ref:	MAR00310.001	MAR00310.002	MAR00310.003	MAR00310.004	MAR00310.005	MAR00310.006
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1	<5
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1	<5
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1	<5

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Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00310
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	L8_B6_G07	Reference Material (% Recovery)	QC Blank
					SOCOTEC Ref:	MAR00310.007		
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment		
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	69	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	81	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	125	<1

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Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00311
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	L5_B1_G01	L5_B2_G02	L5_B3_G03	L5_B4A_G04	L5_B4B_G05
					SOCOTEC Ref:	MAR00311.001	MAR00311.002	MAR00311.003	MAR00311.004	MAR00311.005
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	<1	<1	<1	<1	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00311
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

					Client Reference:	Reference Material (% Recovery)	QC Blank
					SOCOTEC Ref:		
Analyte	**Accreditation**	**Method No**	**Limit of Detection**	**Units**	**Date Extracted**		
Dibutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	69	<1
Tributyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	81	<1
Monobutyltin	N	ASC/SOP/301	1	µg/Kg (Dry Weight)	27/06/2019	125	<1

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_01	ECC_02	ECC_03	ECC_04
						SOCOTEC Ref:	MAR00309.001	MAR00309.002	MAR00309.003	MAR00309.004
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.16	<1	1.42	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	7.02	3.63	4.67	3.81
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	6.64	3.69	4.38	3.96
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	6.08	3.33	3.88	4.19
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.51	2.11	<1	<1
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	25.4	12.8	14.3	12.0
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	5.98	2.19	2.68	3.27
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	6.37	2.76	3.45	4.50
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.43	2.75	3.80	3.58
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.95	1.47	2.30	1.76
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	20.7	9.2	12.2	13.1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.33	<1	<1	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	1.33	0.00	0.00	0.00
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	7.07	4.07	5.41	5.19
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.89	2.20	3.38	3.08
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.94	2.26	3.36	3.09
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.29	1.39	2.21	2.04
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	20.2	9.92	14.4	13.4
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	5.22	1.66	3.60	3.60
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.43	1.85	2.54	2.51
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.80	<1	1.68	1.54
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	11.4	3.51	7.82	7.65
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	13.5	6.56	10.6	10.2
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.91	3.27	5.16	4.64
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.36	1.72	3.56	2.26
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	01/07/2019	23.7	11.6	19.3	17.1
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	01/07/2019	9.41	6.12	8.54	8.11
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.43	<1	1.90	1.44
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.48	1.31	1.46	1.38
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	12.3	7.44	11.9	10.9
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	01/07/2019	115	54.4	79.9	74.2
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	01/07/2019	47.5	22.0	26.6	25.1
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	01/07/2019	0.70	0.68	0.50	0.51

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_05	ECC_06	ECC_07	ECC_08
						SOCOTEC Ref:	MAR00309.005	MAR00309.006	MAR00309.007	MAR00309.008
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	1.68	2.18	3.47
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.10	5.86	7.52	13.7
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.82	5.57	7.69	12.1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.29	5.63	8.33	12.9
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.19	3.15	6.02	7.73
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	13.4	21.9	31.7	50.0
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	2.56	3.64	4.67	7.46
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.21	4.94	8.38	10.9
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.75	5.02	7.86	10.8
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.00	2.74	5.35	6.93
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	11.5	16.3	26.3	36.1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	1.71	2.52
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	1.99	2.60
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	1.44	2.15
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	0.00	0.00	5.14	7.27
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	5.32	6.57	9.86	14.0
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.22	4.14	7.21	9.77
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.32	3.81	7.66	11.4
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.18	2.41	4.82	7.68
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	14.0	16.9	29.6	42.8
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	3.61	4.35	6.43	9.38
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.56	3.12	5.31	7.27
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.99	2.25	3.41	6.46
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	8.17	9.72	15.1	23.1
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	9.90	12.6	15.1	22.8
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.43	5.78	7.90	11.39
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.13	3.65	5.41	9.55
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	01/07/2019	18.5	22.0	28.4	43.8
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	01/07/2019	8.18	9.44	10.9	17.3
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.51	1.79	2.83	3.31
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	1.98	2.87	3.52
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	9.69	13.2	16.6	24.1
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	01/07/2019	75.3	100	153	227
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	01/07/2019	24.9	38.2	63.1	93.3
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	01/07/2019	0.49	0.62	0.70	0.70

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_09	ECC_10	ECC_11
						SOCOTEC Ref:	MAR00309.009	MAR00309.010	MAR00309.011
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.30	2.77	1.41
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	12.3	13.5	5.04
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	11.4	13.2	5.20
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	10.8	12.2	5.91
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	6.60	8.16	4.25
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	44.4	49.8	21.8
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	8.09	8.06	4.59
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	10.2	11.5	6.50
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	8.91	9.50	6.29
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.58	6.11	3.46
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	32.8	35.2	20.8
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.80	2.32	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.07	2.48	1.48
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.49	1.70	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	5.35	6.49	1.48
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	10.6	12.2	7.74
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	7.80	7.78	4.92
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	7.70	10.3	4.90
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.11	6.10	3.45
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	31.2	36.3	21.0
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	7.28	8.06	5.34
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.40	6.51	4.01
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.95	5.59	3.11
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	17.6	20.2	12.5
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	17.8	18.3	13.5
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	8.03	8.51	6.77
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.42	6.82	4.70
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	01/07/2019	31.3	33.6	25.0
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	01/07/2019	11.7	12.8	9.93
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.79	3.19	1.44
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.57	2.83	2.86
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	17.1	18.9	14.2
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	01/07/2019	180	200	117
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	01/07/2019	82.5	91.5	44.1
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	01/07/2019	0.85	0.84	0.61

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Client Reference: / SOCOTEC Ref: / Date Extracted	Reference Material (% Recovery)	QC Blank
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	105	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	111	<1
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	108	<5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	101	<2
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	101	<5
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	112	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	112	<4
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	97	<2
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	97	<5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	01/07/2019	102	<2
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	102	<4
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	01/07/2019	99	<4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	01/07/2019	99	<6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	01/07/2019	97	<3
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	01/07/2019	97	<5
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	01/07/2019	102	<34
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	01/07/2019	107	<14
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	01/07/2019	113	-

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_12	ECC_13	ECC_14	ECC_15
						SOCOTEC Ref:	MAR00309.012	MAR00309.013	MAR00309.014	MAR00309.015
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.94	1.64	<1	2.84
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	7.21	5.50	3.22	11.7
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	8.90	5.19	2.91	12.1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.18	4.53	2.56	12.4
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.74	2.95	1.70	6.43
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	33.0	19.8	10.4	45.5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	5.08	2.75	1.61	9.25
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	7.43	3.78	2.22	12.0
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.84	3.77	2.30	9.23
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.20	2.39	1.41	6.46
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	23.6	12.7	7.55	37.0
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.43	<1	<1	2.02
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.55	<1	<1	2.18
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	1.71
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	2.98	0.00	0.00	5.91
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	8.19	6.03	4.53	14.0
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.73	3.32	2.18	8.61
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.62	3.72	2.06	13.3
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.25	2.32	1.50	7.07
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	23.8	15.4	10.3	43.0
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	5.60	3.89	2.93	8.51
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.97	2.74	2.02	6.07
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.31	1.79	1.52	4.18
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	12.9	8.42	6.47	18.8
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	13.2	10.4	5.42	16.1
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.74	4.57	3.31	7.98
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.68	3.07	2.30	7.30
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	03/07/2019	23.6	18.1	11.0	31.4
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	03/07/2019	8.38	7.64	5.49	9.71
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.39	<1	<1	1.85
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.78	1.37	<1	3.16
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	11.5	9.00	5.49	14.7
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	03/07/2019	131	83.4	51.2	196
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	03/07/2019	59.5	32.5	17.9	88.4
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	03/07/2019	0.83	0.64	0.54	0.82

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_16	ECC_17	ECC_18	ECC_19
						SOCOTEC Ref:	MAR00309.016	MAR00309.017	MAR00309.018	MAR00309.019
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.45	5.95	26.2	75.6
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	11.7	20.7	97.5	227
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.33	17.6	92.2	180
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	8.21	15.2	85.6	163
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.60	8.29	58.4	74.3
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	37.3	67.8	360	721
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	6.42	10.2	64.5	108
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.90	12.8	69.3	110
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.85	10.8	62.6	103
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.46	6.75	42.1	59.2
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	22.6	40.6	238	379
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	4.49	8.71
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	1.78	10.2	18.1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	2.12	12.5	21.1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	1.55	6.73	16.0
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	0.00	5.44	33.9	63.8
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	7.56	12.6	59.4	158
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.79	8.17	41.9	87.5
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.61	9.25	47.6	85.3
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.75	7.26	33.6	60.7
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	21.7	37.3	182	391
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	5.67	8.67	43.3	107
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.84	6.57	32.9	68.9
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.79	5.27	26.9	53.3
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	12.3	20.5	103	230
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	11.0	16.2	70.3	181
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.76	9.47	45.4	100
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.78	7.74	37.4	84.3
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	03/07/2019	21.6	33.4	153	365
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	03/07/2019	7.00	9.70	42.9	100
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.36	2.30	8.91	23.7
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.31	2.62	11.5	24.8
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	10.7	14.6	63.2	148
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	03/07/2019	126	220	1134	2299
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	03/07/2019	59.9	114	632	1164
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	03/07/2019	0.90	1.08	1.26	1.03

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Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_20	ECC_21	ECC_23	ECC_24
						SOCOTEC Ref:	MAR00309.020	MAR00309.021	MAR00309.022	MAR00309.023
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	114	123	8.73	3.97
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	395	387	26.3	13.9
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	357	308	19.4	11.2
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	381	268	18.7	10.7
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	193	121	8.97	7.19
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	1439	1207	82.1	47.0
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	289	173	13.7	6.39
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	324	187	14.1	10.3
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	264	137	12.6	11.6
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	167	86.7	9.25	9.46
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	1044	583	49.6	37.8
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	22.2	14.0	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	48.7	28.9	2.12	2.09
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	41.5	30.8	2.54	2.96
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	34.9	24.9	1.81	2.59
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	147	98.6	6.47	7.64
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	313	226	16.3	18.5
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	245	146	10.8	9.45
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	270	136	10.3	9.7
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	178	100	6.88	7.58
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	1006	608	44.2	45.3
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	210	161	11.1	11.4
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	155	107	7.58	7.61
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	138	79.8	5.91	6.49
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	503	348	24.6	25.5
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	298	253	16.8	18.2
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	198	161	10.7	11.5
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	170	125	7.95	9.33
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	03/07/2019	666	538	35.4	39.0
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	03/07/2019	159	146	8.27	9.19
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	40.9	38.3	2.50	2.51
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	43.7	37.2	3.45	3.46
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	244	222	14.2	15.2
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	03/07/2019	5048	3604	257	217
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	03/07/2019	2630	1888	138	92.4
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	03/07/2019	1.09	1.10	1.17	0.74

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_25	ECC_26	ECC_27
						SOCOTEC Ref:	MAR00309.024	MAR00309.025	MAR00309.026
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.70	4.39	5.01
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	19.7	14.8	15.6
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	17.3	12.5	12.9
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	17.9	14.7	10.8
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.20	7.52	6.48
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	69.8	53.9	50.8
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	11.3	7.65	12.2
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	13.3	11.8	12.6
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	12.8	11.3	10.0
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.37	7.99	8.50
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	46.8	38.7	43.3
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.38	1.92	2.03
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.07	2.30	2.90
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.06	1.94	1.92
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	7.51	6.16	6.85
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	17.5	14.5	30.4
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	10.7	9.95	11.9
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	10.1	9.83	9.28
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	7.81	6.34	7.06
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	46.1	40.6	58.7
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	11.6	9.48	20.1
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	7.85	6.61	8.51
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.62	6.65	5.97
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	26.0	22.7	34.6
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	18.8	15.8	31.3
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	11.6	11.0	14.0
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.42	6.88	7.79
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	03/07/2019	39.8	33.7	53.0
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	03/07/2019	9.78	9.09	16.0
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.30	2.65	3.09
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.63	3.35	3.23
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	15.7	15.1	22.4
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	03/07/2019	252	211	270
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	03/07/2019	124	98.8	101
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	03/07/2019	0.97	0.88	0.60

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Client Reference: / SOCOTEC Ref: / Date Extracted	Reference Material (% Recovery)	QC Blank
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	122	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	124	<1
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	123	<5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	101	<2
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	101	<5
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	112	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	112	<4
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	99	<2
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	99	<5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	03/07/2019	104	<2
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	104	<4
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	03/07/2019	103	<4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	03/07/2019	103	<6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	03/07/2019	105	<3
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	03/07/2019	105	<5
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	03/07/2019	107	<34
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	03/07/2019	112	<14
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	03/07/2019	114	-

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00310
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	L8_B1_G01	L8_B1_G02	L8_B2_G03	L8_B3_G04
						SOCOTEC Ref:	MAR00310.001	MAR00310.002	MAR00310.003	MAR00310.004
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.72	9.14	2.88	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	5.69	27.9	8.67	2.81
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.01	23.1	7.99	4.34
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.27	21.3	7.29	7.50
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.68	10.1	3.51	4.89
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	16.4	91.4	30.3	19.5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	4.13	15.4	6.83	4.96
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.60	18.4	7.61	9.40
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.05	15.2	5.63	8.86
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	8.47	3.52	5.93
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	9.78	57.5	23.6	29.1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.43	<1	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.03	1.46	1.77
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.50	1.48	2.03
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.41	<1	1.35
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	0.00	10.4	2.94	5.15
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	1.40	19.6	7.77	11.9
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.93	13.2	5.25	9.77
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.27	13.9	5.42	13.5
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.10	8.80	3.41	9.43
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	8.71	55.4	21.8	44.6
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	1.33	11.5	4.57	6.83
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	8.80	3.52	5.61
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.56	2.54	4.16
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	1.33	26.9	10.6	16.6
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	0.00	23.0	8.05	12.6
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.94	14.4	5.77	7.47
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	10.7	3.54	6.00
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	28/06/2019	1.94	48.1	17.4	26.0
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	28/06/2019	0.00	16.4	6.04	5.97
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.20	<1	1.38
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.47	1.83	1.35
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	0.00	24.1	7.88	8.70
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	28/06/2019	38.1	314	115	150
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	28/06/2019	26.2	159	56.9	53.8
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	28/06/2019	2.18	1.03	0.99	0.56

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00310
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	L8_B4_G05	L8_B5_G06	L8_B6_G07
						SOCOTEC Ref:	MAR00310.005	MAR00310.006	MAR00310.007
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.54	1.19	6.50
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	11.2	5.77	23.3
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	8.94	7.50	23.4
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	7.59	7.56	23.3
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.64	4.07	11.0
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	34.9	26.1	87.5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	5.57	4.88	23.5
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	7.32	7.14	23.1
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	6.12	6.52	17.2
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.63	3.62	10.9
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	22.6	22.2	74.7
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	2.19
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.53	3.88
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.52	1.79	3.92
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	2.87
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	1.52	3.33	12.9
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	8.21	8.93	20.1
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	5.56	6.23	15.2
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	5.96	6.78	17.1
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.87	3.79	10.1
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	23.6	25.7	62.5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	4.98	4.45	12.7
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.34	3.79	8.55
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.41	2.43	6.96
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	10.7	10.7	28.2
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	8.87	9.60	23.4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	5.81	5.35	15.1
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.78	3.38	12.2
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	28/06/2019	19.5	18.3	50.7
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	28/06/2019	6.71	6.30	18.5
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.72	1.62	4.66
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.47	1.40	4.79
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	9.90	9.32	28.0
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	28/06/2019	123	116	345
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	28/06/2019	59.0	51.6	175
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	28/06/2019	0.93	0.81	1.03

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00310
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Client Reference: / SOCOTEC Ref: / Date Extracted	Reference Material (% Recovery)	QC Blank
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	111	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	113	<1
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	112	<5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	101	<2
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	101	<5
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	111	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	111	<4
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	99	<2
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	99	<5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	88	<2
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	88	<4
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	90	<4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	28/06/2019	90	<6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	28/06/2019	106	<3
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	N.D	<1
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	106	<5
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	28/06/2019	101	<34
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	28/06/2019	108	<14
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	28/06/2019	117	-

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00311
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	L5_B1_G01	L5_B2_G02	L5_B3_G03	L5_B4A_G04
						SOCOTEC Ref:	MAR00311.001	MAR00311.002	MAR00311.003	MAR00311.004
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.11	1.38	6.76
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.28	4.55	7.94	27.2
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.73	8.86	23.7
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.52	10.5	24.4
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.63	6.10	13.0
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	1.28	21.5	34.8	95.0
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	0.00	3.86	4.94	22.8
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.96	9.11	27.4
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.17	8.83	19.6
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.12	5.65	12.2
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	0.00	21.1	28.5	82.0
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	2.27
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.34	1.48	4.23
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.85	1.44	3.99
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.25	<1	2.29
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	0.00	4.44	2.93	12.8
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	0.00	6.81	7.45	26.3
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.70	10.8	21.8
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.87	12.3	22.9
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.25	7.09	16.6
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	0.00	24.6	37.7	87.5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	0.00	3.78	4.23	18.3
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.38	4.28	12.7
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.56	3.65	9.64
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	0.00	9.72	12.2	40.7
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	0.00	6.13	4.86	40.4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.40	5.19	5.69	22.9
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.66	4.16	17.2
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	28/06/2019	1.40	15.0	14.7	80.6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	28/06/2019	0.00	5.12	2.08	34.9
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.72	<1	6.46
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.22	<1	7.95
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	0.00	8.06	2.08	49.3
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	28/06/2019	2.68	104	133	448
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	28/06/2019	1.28	47.1	66.27	190
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	28/06/2019	0.91	0.82	0.99	0.74

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00311
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4

						Client Reference:	L5_B4B_G05	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:	MAR00311.005		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment		
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	8.49	111	<1
C1 Naphthalenes	142	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	29.7	113	<1
C2 Naphthalenes	156	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	24.6	N.D	<1
C3 Naphthalenes	170	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	22.4	N.D	<1
C4 Naphthalenes	184	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	12.1	N.D	<1
Sum Naphthalenes	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	97.3	112	<5
Phenanthrene / Anthracene	178	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	16.2	101	<2
C1 178	192	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	21.2	N.D	<1
C2 178	206	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	17.5	N.D	<1
C3 178	220	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	11.3	N.D	<1
Sum 178	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	66.3	101	<5
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.65	111	<1
C1 Dibenzothiophenes	198	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.76	N.D	<1
C2 Dibenzothiophenes	212	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.06	N.D	<1
C3 Dibenzothiophenes	226	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.09	N.D	<1
Sum Dibenzothiophenes	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	12.6	111	<4
Fluoranthene / pyrene	202	N	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	21.7	99	<2
C1 202	216	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	14.8	N.D	<1
C2 202	230	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	14.9	N.D	<1
C3 202	244	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	11.0	N.D	<1
Sum 202	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	62.5	99	<5
Benzoanthracene / Chrysene	228	UKAS	ASC/SOP/303/304	2	µg/Kg (Dry Weight)	28/06/2019	12.5	88	<2
C1 228	242	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	9.51	N.D	<1
C2 228	256	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	7.03	N.D	<1
Sum 228	-	N	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	29.1	88	<4
Benzofluoranthenes /benzopyrenes	252	UKAS	ASC/SOP/303/304	4	µg/Kg (Dry Weight)	28/06/2019	25.7	90	<4
C1 252	266	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	16.8	N.D	<1
C2 252	280	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	14.9	N.D	<1
Sum 252	-	N	ASC/SOP/303/304	6	µg/Kg (Dry Weight)	28/06/2019	57.4	90	<6
Dibenzoanthracene / Indenopyrene /Benzoperylene	276	UKAS	ASC/SOP/303/304	3	µg/Kg (Dry Weight)	28/06/2019	19.9	106	<3
C1 276	290	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.88	N.D	<1
C2 276	304	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	3.95	N.D	<1
Sum 276	-	N	ASC/SOP/303/304	5	µg/Kg (Dry Weight)	28/06/2019	28.7	106	<5
Sum of all fractions	-	N	ASC/SOP/303/304	34	µg/Kg (Dry Weight)	28/06/2019	354	101	<34
Sum of NPD fraction	-	N	ASC/SOP/303/304	14	µg/Kg (Dry Weight)	28/06/2019	176	108	<14
NPD / 4-6 ring PAH ratio	-	N	ASC/SOP/303/304	-	µg/Kg (Dry Weight)	28/06/2019	0.99	117	-

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_01	ECC_02	ECC_03	ECC_04	ECC_05	ECC_06
						SOCOTEC Ref:	MAR00309.001	MAR00309.002	MAR00309.003	MAR00309.004	MAR00309.005	MAR00309.006
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.16	<1	1.42	<1	<1	1.68
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.98	2.19	2.68	3.27	2.56	3.64
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.99	2.38	3.04	2.95	3.08	3.75
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.08	1.69	2.37	2.24	2.24	2.82
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.86	<1	1.36	1.35	1.35	1.60
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.35	1.66	2.24	2.25	2.26	2.75
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.83	3.02	4.07	3.86	3.65	4.78
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.72	1.42	1.78	1.68	1.63	2.27
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.69	2.13	2.98	2.88	2.99	3.48
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.24	<1	1.72	1.78	1.63	2.06
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.27	2.89	4.09	3.98	3.80	4.59
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.14	3.24	4.45	4.13	4.38	4.85

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_07	ECC_08	ECC_09	ECC_10	ECC_11
						SOCOTEC Ref:	MAR00309.007	MAR00309.008	MAR00309.009	MAR00309.010	MAR00309.011
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.18	3.47	3.30	2.77	1.41
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.67	7.46	8.09	8.06	4.59
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.46	7.89	5.94	6.83	4.33
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.41	6.14	4.69	5.34	3.41
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.45	3.58	2.69	3.12	2.02
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	3.97	5.80	4.59	4.93	3.33
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.98	8.68	6.78	7.28	5.63
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	1.97	3.64	3.36	2.63	1.80
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.44	6.52	4.81	5.39	3.90
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	2.70	4.00	2.87	3.00	2.22
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	1.77	<1	<1	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	4.91	7.96	5.47	6.31	4.87
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	<1	1.32	<1	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	5.99	8.04	6.26	6.53	5.06

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted		
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	105	<1
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	100	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	105	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	105	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	103	<1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	112	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	99	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	97	<1
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	97	<1
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	98	<1
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	106	<1
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	90	<1
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	112	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	89	<1
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	104	<1
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	108	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	91	<1
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	99	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	01/07/2019	100	<1

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_12	ECC_13	ECC_14	ECC_15	ECC_16	ECC_17
						SOCOTEC Ref:	MAR00309.012	MAR00309.013	MAR00309.014	MAR00309.015	MAR00309.016	MAR00309.017
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.94	1.64	<1	2.84	3.45	5.95
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	1.30
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.08	2.75	1.61	9.25	6.42	10.2
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.53	3.42	2.66	7.92	4.23	6.22
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.66	2.61	1.86	6.10	3.34	6.39
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.16	1.51	1.08	3.31	2.02	3.42
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.45	2.38	1.85	5.20	3.65	5.25
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.93	4.11	3.13	6.18	4.03	5.16
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.24	1.58	<1	1.98	1.40	2.33
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.80	2.92	2.29	4.96	3.39	5.40
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	2.23	1.81	<1	2.99	2.17	3.33
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.82	3.56	2.53	4.21	3.19	4.08
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.55	4.08	2.95	5.50	3.81	5.62

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Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_18	ECC_19	ECC_20	ECC_21	ECC_23	ECC_24
						SOCOTEC Ref:	MAR00309.018	MAR00309.019	MAR00309.020	MAR00309.021	MAR00309.022	MAR00309.023
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	26.2	75.6	114	123	8.73	3.97
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.92	5.06	6.75	7.11	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.52	10.3	17.7	15.6	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.12	18.5	29.1	29.2	1.57	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	58.5	93.1	258	149	12.0	6.39
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.49	8.71	22.2	14.0	<1	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.00	15.0	30.3	24.0	1.66	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	29.1	82.4	157	118	8.45	9.25
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	30.3	75.4	156	108	7.88	9.30
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	18.2	49.1	93.0	73.1	4.63	3.85
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	25.1	58.3	117	88.3	6.46	7.55
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	22.9	59.3	94.4	81.3	4.93	5.85
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	8.44	25.0	32.2	30.0	2.15	2.33
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	21.4	50.2	89.8	74.4	5.61	6.70
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	17.6	46.5	81.7	67.1	4.14	3.34
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.20	11.1	19.2	15.4	<1	1.35
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	16.0	40.0	57.8	56.4	3.04	3.33
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.58	9.65	14.3	13.3	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	23.2	50.3	86.9	76.8	5.23	5.86

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	ECC_25	ECC_26	ECC_27	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:	MAR00309.024	MAR00309.025	MAR00309.026		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment		
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	5.70	4.39	5.01	122	<1
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	119	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	118	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.47	<1	<1	121	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	9.91	7.65	8.73	103	<1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	112	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.44	<1	3.50	98	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	8.81	7.01	15.9	99	<1
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	8.65	7.50	14.5	98	<1
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.40	3.30	8.66	102	<1
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	7.15	6.18	11.4	105	<1
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.04	4.64	9.51	104	<1
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.81	1.70	4.33	105	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.68	6.31	9.13	94	<1
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	4.28	3.12	8.30	109	<1
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	1.37	<1	2.58	115	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	3.78	3.06	6.47	104	<1
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	1.52	104	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	03/07/2019	6.00	6.04	8.05	108	<1

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Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00310
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	L8_B1_G01	L8_B1_G02	L8_B2_G03	L8_B3_G04	L8_B4_G05	L8_B5_G06
						SOCOTEC Ref:	MAR00310.001	MAR00310.002	MAR00310.003	MAR00310.004	MAR00310.005	MAR00310.006
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.72	9.14	2.88	<1	3.54	1.19
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.07	<1	<1	<1	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.13	13.5	6.83	4.96	5.57	4.88
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.43	<1	<1	<1	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.86	<1	<1	<1	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.40	10.2	4.12	5.91	4.34	4.99
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	9.37	3.64	5.98	3.86	3.94
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	4.36	1.70	2.32	1.75	1.68
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.33	7.17	2.87	4.51	3.23	2.78
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	6.76	2.92	3.90	3.40	3.21
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.17	<1	2.22	<1	1.73
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	7.65	2.88	3.83	3.23	2.80
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	5.46	2.26	2.61	2.24	1.86
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.68	<1	1.31	<1	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	5.64	2.33	1.81	2.30	2.59
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.41	<1	<1	<1	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	9.34	3.71	4.17	4.40	3.71

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00310
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	L8_B6_G07	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:	MAR00310.007		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment		
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	6.50	111	<1
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	99	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	102	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.84	103	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	21.9	102	<1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.19	111	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.52	99	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	10.4	101	<1
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	9.69	98	<1
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.27	85	<1
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	8.45	91	<1
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	8.09	85	<1
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.80	95	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	7.69	83	<1
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	4.80	99	<1
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	2.87	99	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	6.50	107	<1
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	1.47	102	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	10.5	108	<1

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Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00311
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	L5_B1_G01	L5_B2_G02	L5_B3_G03	L5_B4A_G04	L5_B4B_G05
						SOCOTEC Ref:	MAR00311.001	MAR00311.002	MAR00311.003	MAR00311.004	MAR00311.005
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.11	1.38	6.76	8.49
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	<1	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	3.33	2.00
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.86	4.94	21.2	14.5
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	2.27	1.65
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	1.57	1.72
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.23	3.61	11.2	11.0
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.58	3.84	15.0	10.7
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.34	1.67	5.89	4.38
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.44	2.56	12.4	8.16
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.12	1.48	12.7	7.84
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	4.90	3.23
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	2.45	1.72	16.8	8.70
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.56	1.66	6.05	5.90
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	2.98	3.80
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	1.38	<1	8.36	6.13
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	<1	<1	2.48	1.59
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	<1	3.74	2.08	24.0	12.2

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00311
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

						Client Reference:	Reference Material (% Recovery)	QC Blank
						SOCOTEC Ref:		
Analyte	Mass	Accreditation	Method No	Limit of Detection	Units	Date Extracted		
Naphthalene	128	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	111	<1
Acenaphthylene	152	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	99	<1
Acenaphthene	154	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	102	<1
Fluorene	166	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	103	<1
Phenanthrene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	102	<1
Dibenzothiophene	184	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	111	<1
Anthracene	178	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	99	<1
Fluoranthene	202	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	101	<1
Pyrene	202	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	98	<1
Benzo[a]anthracene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	85	<1
Chrysene	228	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	91	<1
Benzo[b]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	85	<1
Benzo[k]fluoranthene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	95	<1
Benzo[e]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	83	<1
Benzo[a]pyrene	252	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	99	<1
Perylene	252	N	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	99	<1
Indeno[123,cd]pyrene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	107	<1
Dibenzo[a,h]anthracene	278	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	102	<1
Benzo[ghi]perylene	276	UKAS	ASC/SOP/303/304	1	µg/Kg (Dry Weight)	28/06/2019	108	<1

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_01	ECC_02	ECC_03	ECC_04	ECC_05	ECC_06
					SOCOTEC Ref:	MAR00309.001	MAR00309.002	MAR00309.003	MAR00309.004	MAR00309.005	MAR00309.006
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1	<1
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	7.11	2.65	3.27	17.2
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	3.90	1.36	3.55	1.91	1.90	3.37
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	9.84	4.63	7.93	4.61	7.37	7.82
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	24.0	11.9	19.7	14.5	16.5	17.0
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.23	2.83	5.03	2.07	3.40	4.18
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.42	3.46	5.21	2.38	3.12	2.32
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.11	3.85	6.62	5.12	4.77	5.44
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.16	3.89	5.78	3.87	3.11	4.45
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	9.11	3.68	9.86	5.99	4.96	9.57
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.74	2.59	3.07	1.93	2.61	3.13
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.73	2.69	4.62	1.92	5.22	7.55
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	5.89	3.59	4.51	3.15	4.00	4.70
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	2.33	2.36	7.78	7.25	1.53	7.92
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.38	2.95	4.62	2.56	3.55	5.28
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	24.5	8.88	13.4	12.7	11.5	19.8
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	5.11	3.36	4.26	2.34	2.66	4.49
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	22.2	9.53	14.9	10.4	16.8	14.9
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	11.4	5.09	2.44	4.49	5.22	5.52
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	15.1	4.98	4.65	10.75	3.95	5.45
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.55	2.68	2.06	6.06	2.50	4.23
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.21	4.06	1.96	5.49	3.70	4.91
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.67	4.38	2.46	5.70	5.35	8.89
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	1.83	1.85	<1	1.70	1.39	2.47
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	2.12	1.75	1.44	1.31	3.09	4.56
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	1.65	<1	2.13
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	01/07/2019	7,157	5,790	6,852	7,638	9,103	9,543
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	01/07/2019	164	77	118	106	102	158
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	1.78	1.24	2.01	1.98	1.72	1.99
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	24.0	11.9	19.7	14.5	16.5	17.0
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.42	3.46	5.21	2.38	3.12	2.32
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	3.23	3.44	3.77	6.08	5.29	7.30

Note: sample data are blank corrected

N.D = Not Determined

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_07	ECC_08	ECC_09	ECC_10	ECC_11
					SOCOTEC Ref:	MAR00309.007	MAR00309.008	MAR00309.009	MAR00309.010	MAR00309.011
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	<1	<1	<1
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	<1	2.74	3.98	3.51
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.84	9.67	8.11	11.1	16.1
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.50	4.39	7.21	6.05	5.79
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	10.2	13.6	10.2	12.8	9.4
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	27.4	42.1	35.9	34.5	29.0
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	5.07	8.14	6.75	8.02	5.51
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.32	3.44	4.00	3.75	2.67
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.95	10.4	8.10	8.53	5.68
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.49	8.80	8.79	8.47	7.23
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	11.2	19.1	10.9	12.9	7.75
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.01	8.04	5.90	4.88	3.86
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	9.10	11.9	7.55	8.18	6.89
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.15	8.64	7.54	7.61	5.04
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	9.42	11.2	9.03	11.0	7.72
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	6.73	10.1	7.72	7.24	4.45
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	17.9	23.4	19.8	22.2	13.2
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.20	7.48	6.25	7.90	4.35
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	16.2	22.2	12.7	14.7	10.8
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	4.42	5.29	5.07	3.77	5.69
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	14.7	19.1	5.53	7.13	6.41
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.98	4.98	3.66	7.98	<1
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.26	7.81	5.18	5.12	4.23
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	5.29	11.8	13.5	6.85	<1
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	3.03	5.98	1.86	2.98	<1
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	3.80	2.74	3.70	2.70	<1
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	<1	4.48	<1	1.41	<1
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	01/07/2019	10,012	13,194	9,389	10,885	7,734
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	01/07/2019	179	239	178	194	134
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	1.73	1.98	1.26	1.57	1.94
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	27.4	42.1	35.9	34.5	29.0
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	7.32	3.44	4.00	3.75	2.67
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	3.74	12.2	8.97	9.20	10.8

Note: sample data are blank corrected

N.D = Not Determined

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

Analyte	Accreditation	Method No	Limit of Detection	Units	Client Reference: / SOCOTEC Ref: / Date Extracted	Reference Material (% Recovery)	QC Blank
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	85	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	84	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	90	<1
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	86	<1
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	99	<1
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	110	<1
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	102	<1
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	102	<1
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	98	<1
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	99	<1
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	102	<1
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	98	<1
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	97	<1
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	86	<1
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	01/07/2019	-	<100
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	01/07/2019	96	<28
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	-	-
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	N.D	<1
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	01/07/2019	-	-

Note: sample data are blank corrected

N.D = Not Determined

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_12	ECC_13	ECC_14	ECC_15	ECC_16	ECC_17
					SOCOTEC Ref:	MAR00309.012	MAR00309.013	MAR00309.014	MAR00309.015	MAR00309.016	MAR00309.017
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	<1	<1
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.77	3.08	<1	<1	<1	12.1
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	2.20	<1	6.73	5.39	6.76
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.52	2.76	3.34	11.7	7.24	18.6
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	38.4	14.0	14.7	68.5	29.3	55.5
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.64	3.44	2.60	8.54	4.82	14.4
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.70	4.17	2.83	15.8	9.74	23.1
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	7.05	4.75	7.23	11.6	6.28	19.6
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.51	2.81	4.41	12.7	6.34	18.7
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.85	3.13	4.67	9.47	8.87	23.7
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.59	1.79	3.65	10.3	5.21	12.5
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	4.93	4.40	5.83	14.8	7.01	15.3
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.43	2.90	4.29	11.2	5.72	12.3
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.82	3.44	7.79	8.97	9.85	15.8
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	6.52	4.27	6.13	12.5	6.58	12.8
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	7.55	12.2	5.55	16.4	8.74	16.6
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	4.50	3.45	3.96	8.27	4.42	9.5
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	12.2	11.0	5.48	19.7	12.8	21.1
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.23	6.07	3.31	7.21	4.69	11.3
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	8.98	11.4	3.94	14.5	10.4	17.1
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	2.78	2.27	1.32	5.28	2.47	4.79
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	2.44	6.55	1.57	7.49	7.21	8.53
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.47	1.80	<1	3.13	1.80	6.53
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	4.39	<1	2.21
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.58	<1	<1	3.72	2.42	2.08
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1	<1	1.49	2.43
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	03/07/2019	5,305	2,797	4,274	7,546	4,874	5,441
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	03/07/2019	100	93.7	75.1	209	130	285
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.37	2.02	1.53	1.33	1.60	1.55
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	38.4	14.0	14.7	68.5	29.3	55.5
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.70	4.17	2.83	15.8	9.74	23.1
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	6.74	3.35	5.18	4.33	3.01	2.41

Note: sample data are blank corrected

N.D = Not Determined

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_18	ECC_19	ECC_20	ECC_21	ECC_23	ECC_24
					SOCOTEC Ref:	MAR00309.018	MAR00309.019	MAR00309.020	MAR00309.021	MAR00309.022	MAR00309.023
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	80.1	53.5	4.25	11.2
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	2.66	7.03	104	81.5	7.46	10.4
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	24.7	31.9	94.0	65.5	17.5	19.7
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	36.5	34.5	166	129	13.0	26.2
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	46.9	54.1	151	107	21.6	38.3
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	73.4	83.3	192	128	31.0	56.9
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	77.9	94.0	156	136	31.0	73.9
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	60.8	79.1	215	139	31.0	61.7
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	225	242	898	376	59.9	96.5
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	42.8	57.2	121	90.2	23.6	48.2
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	137	97.4	226	78.8	11.6	9.94
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	46.3	68.1	120	101	21.7	47.8
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	50.7	73.8	203	126	23.1	42.6
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	60.1	120	299	195	25.8	42.8
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	35.9	49.4	120	80.8	18.1	29.7
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	44.2	58.3	152	105	19.7	30.7
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	38.2	56.3	155	87.2	17.7	29.3
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	40.5	59.7	171	100	8.99	25.5
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	39.2	60.9	151	93.4	18.0	25.4
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	49.3	70.5	201	100	15.6	22.9
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	31.8	37.0	107	68.1	12.1	15.4
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	55.4	90.2	197	132	15.8	29.5
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	27.4	49.9	116	75.7	11.7	13.1
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	38.2	92.0	140	102	11.6	19.4
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	10.2	18.4	31.8	22.4	59.8	9.06
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	17.9	50.6	83.3	60.2	4.19	7.92
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.96	12.1	28.1	16.1	1.95	4.29
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.19	10.0	12.9	7.15	1.32	5.54
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	2.96	3.70	6.85	5.36	<1	1.64
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	2.51	6.44	23.5	7.07	<1	2.01
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	03/07/2019	18,403	25,975	61,644	43,790	9,210	10,778
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	03/07/2019	966	1,428	3,599	2,415	467	751
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.23	1.39	1.36	1.35	0.80	1.08
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	225	242	898	376	59.9	96.5
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	137	97.4	226	78.8	11.6	9.94
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.64	2.48	3.97	4.77	5.16	9.70

Note: sample data are blank corrected

N.D = Not Determined

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Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

					Client Reference:	ECC_25	ECC_26	ECC_27
					SOCOTEC Ref:	MAR00309.024	MAR00309.025	MAR00309.026
Analyte	Accreditation	Method No	Limit of Detection	Units	Date Extracted	Sediment	Sediment	Sediment
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	<1	<1	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	18.2	17.1	15.5
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	27.4	26.1	22.9
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	43.1	42.3	29.2
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	21.5	28.3	52.7
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	46.8	40.5	38.5
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	82.5	64.7	65.4
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	34.7	30.4	30.0
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	9.50	6.03	9.75
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	32.1	29.8	29.3
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	35.4	29.4	29.0
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	27.4	24.4	30.4
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	22.6	18.5	21.2
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	24.5	21.0	23.3
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	20.1	18.4	21.9
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	24.3	17.2	40.8
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	19.6	17.2	17.3
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	18.8	14.7	15.5
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	15.6	9.47	11.4
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	19.2	17.1	14.8
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	12.8	7.36	10.8
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	14.9	11.1	13.6
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	5.91	4.10	5.87
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	6.55	7.49	6.14
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.79	2.60	4.14
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	3.20	1.73	2.26
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.76	<1	<1
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.47	<1	1.69
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	03/07/2019	7,854	6,774	6,955
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	03/07/2019	502	436	488
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	1.27	1.27	1.15
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	82.5	64.7	65.4
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	9.50	6.03	9.75
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	8.68	10.7	6.71

Note: sample data are blank corrected

N.D = Not Determined

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Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

Analyte	Accreditation	Method No	Limit of Detection	Units	Client Reference: / SOCOTEC Ref: / Date Extracted	Reference Material (% Recovery)	QC Blank
nC10	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	91	<1
nC11	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC12	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	96	<1
nC13	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC14	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	85	<1
nC15	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC16	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	95	<1
nC17	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC18	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	95	<1
phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC19	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC20	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	98	<1
nC21	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC22	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	85	<1
nC23	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC24	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	93	<1
nC25	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC26	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	97	<1
nC27	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC28	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	92	<1
nC29	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC30	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	95	<1
nC31	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC32	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	94	<1
nC33	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC34	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	94	<1
nC35	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
nC36	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	82	<1
nC37	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Total Oil	N	ASC/SOP/303/306	100	µg/Kg (Dry Weight)	03/07/2019	-	<100
Total n alkanes	N	ASC/SOP/303/306	28	µg/Kg (Dry Weight)	03/07/2019	92	<28
Carbon Preference Index	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	-	-
Pristane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Phytane	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019	N.D	<1
Pristane / phytane ratio	N	ASC/SOP/303/306	1	µg/Kg (Dry Weight)	03/07/2019		-

Note: sample data are blank corrected

N.D = Not Determined

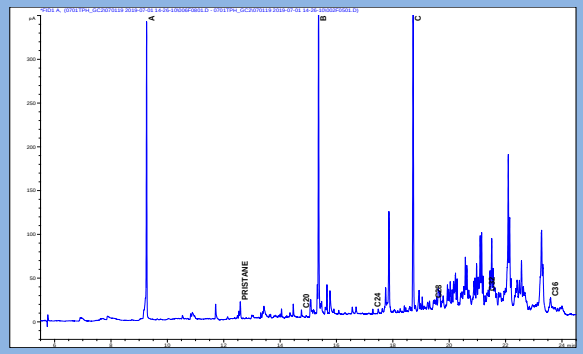
As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

Absolute values reported at the request of the client. Refer to Limit of Detection Column for LODs

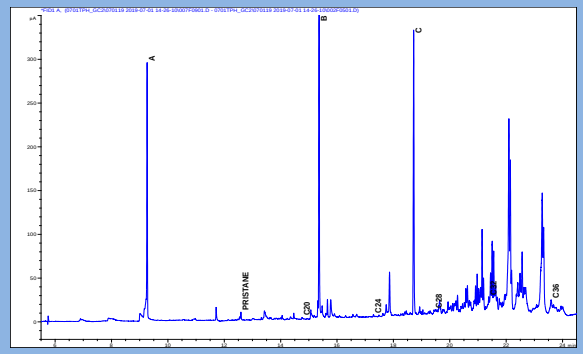
Certificate of Analysis

Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID	MAR00309
Issue Version	2
Customer Reference	BSL-1908 Orsted HOW3 & 4



MAR00309.001
ECC_01



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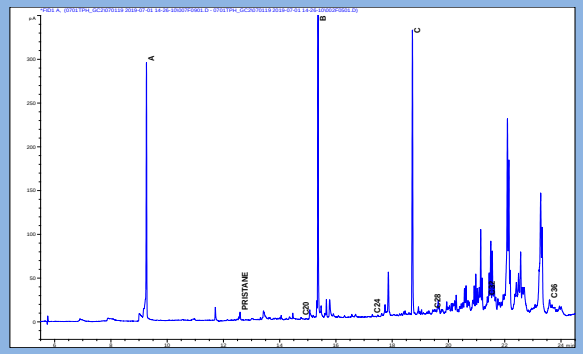

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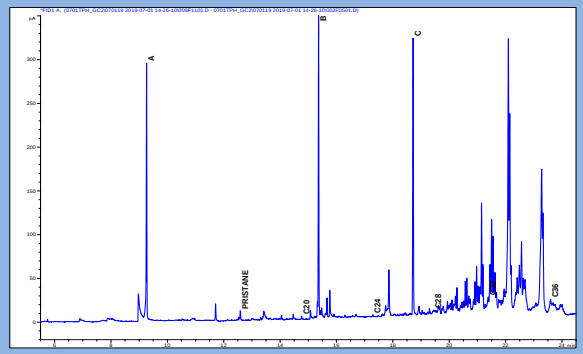

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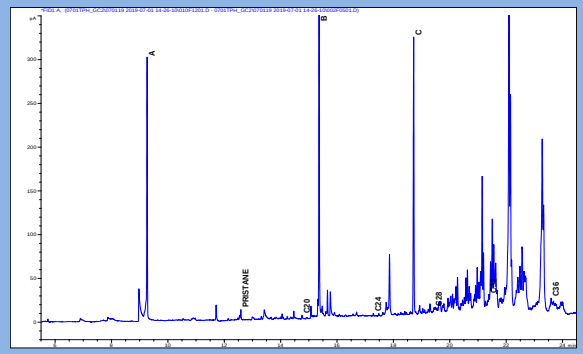

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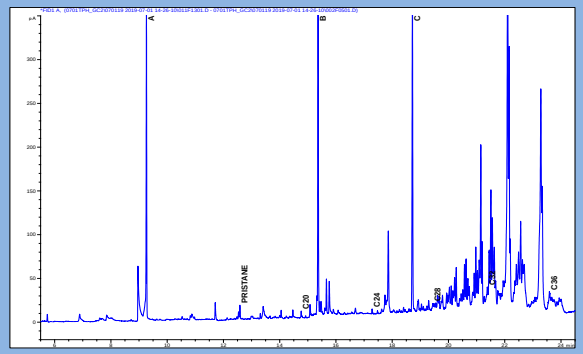

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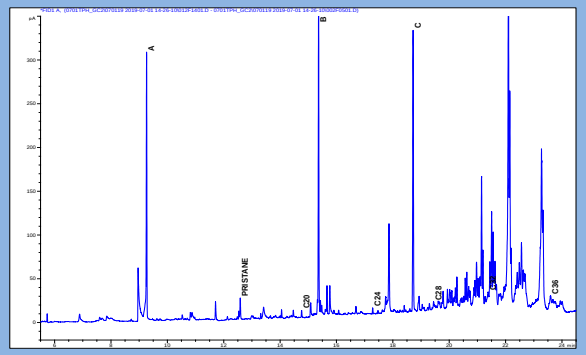

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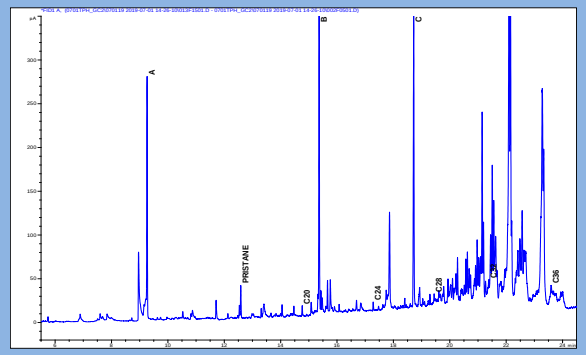

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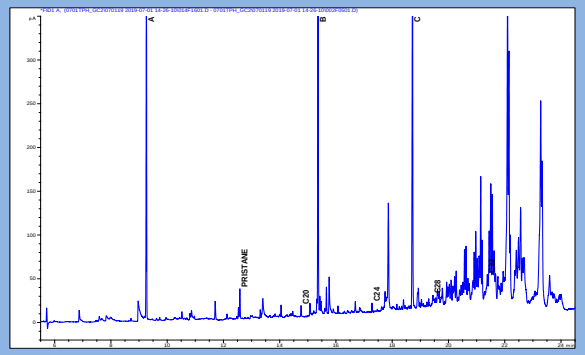

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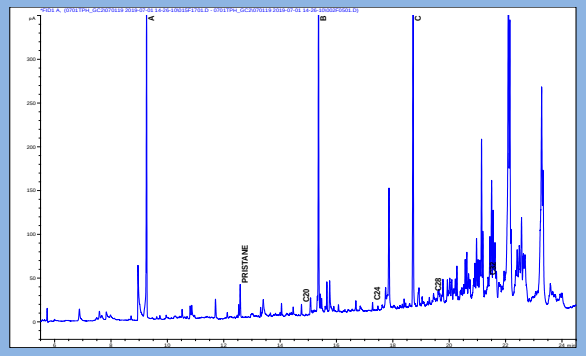

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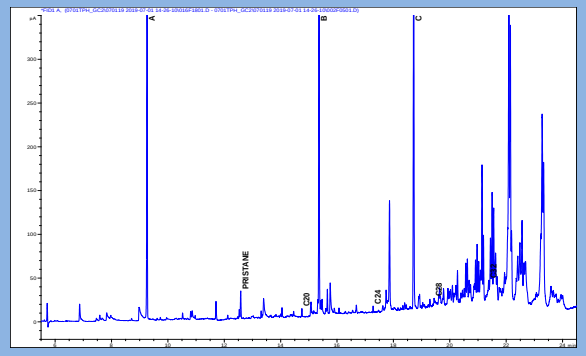

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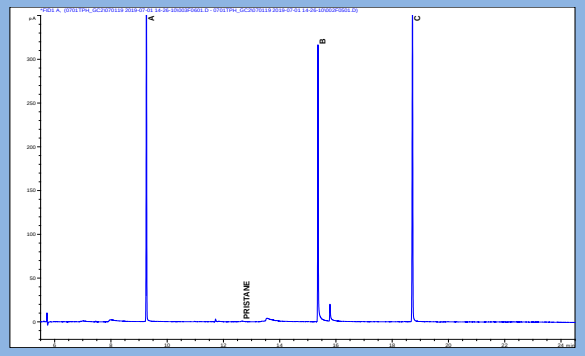

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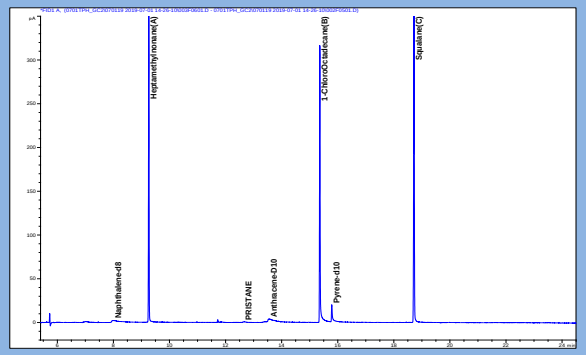

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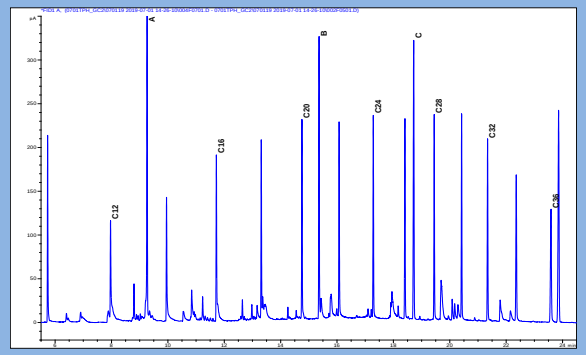

Reference Material

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Test Report ID	MAR00309
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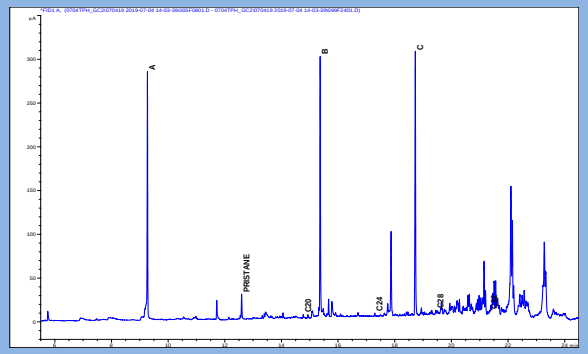

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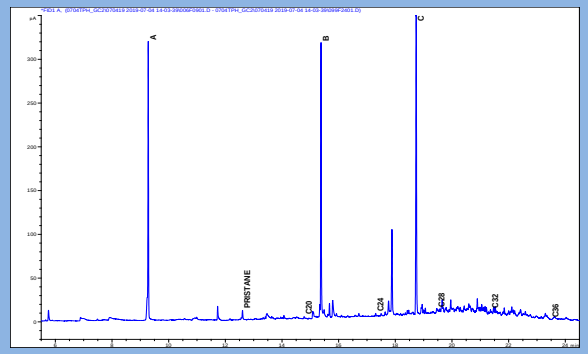

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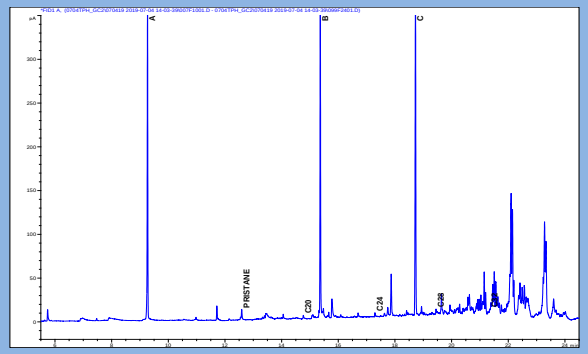

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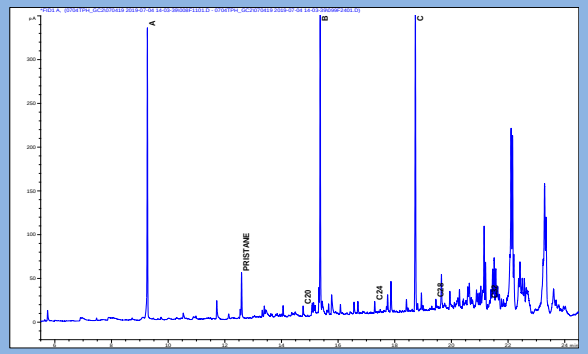

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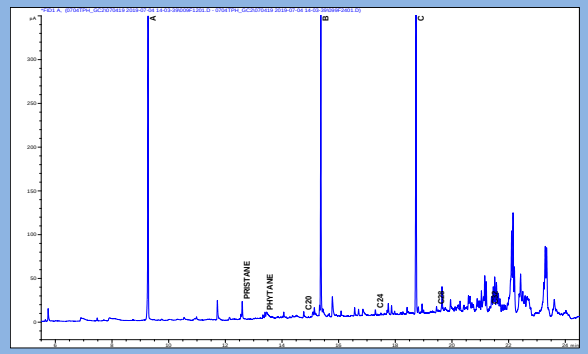

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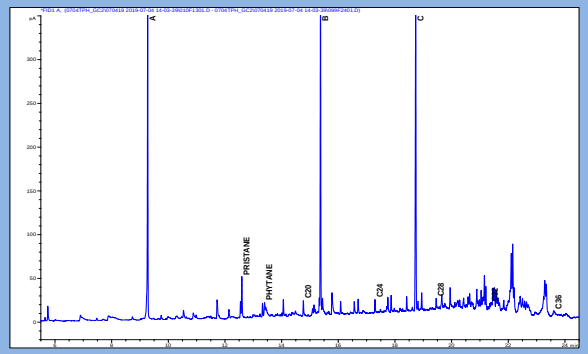

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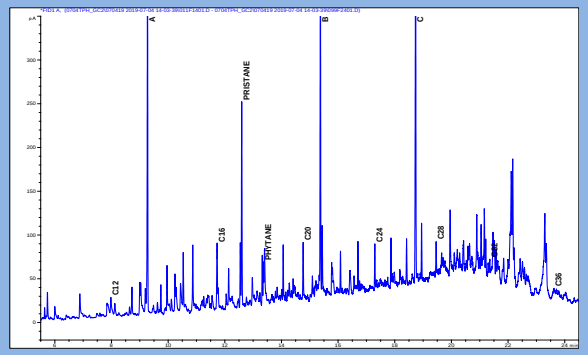

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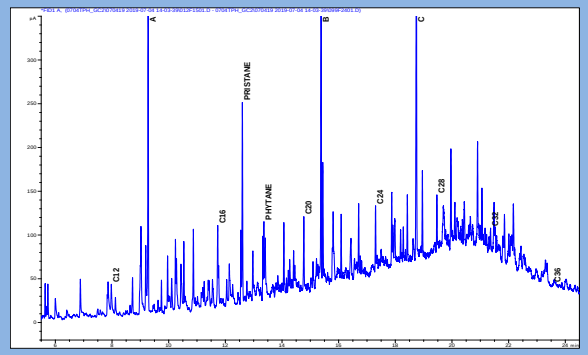

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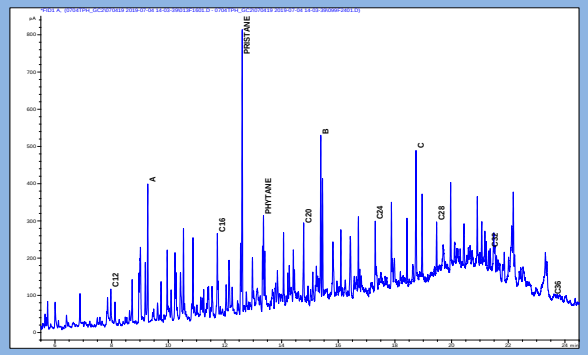

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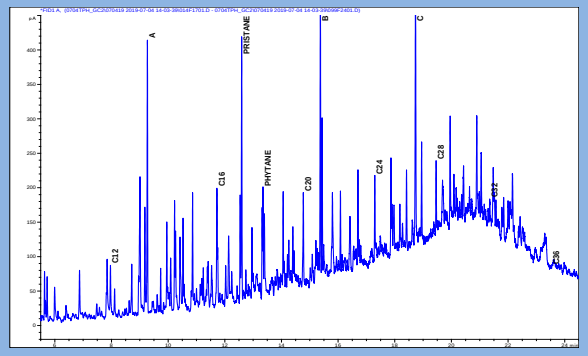

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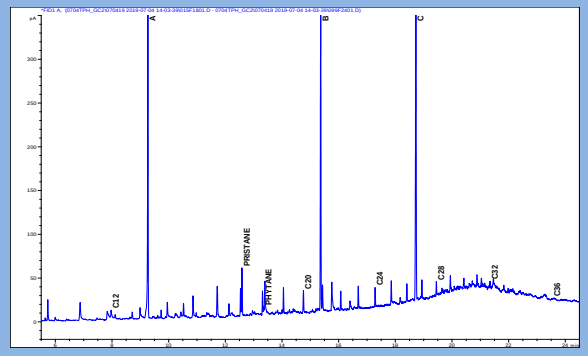

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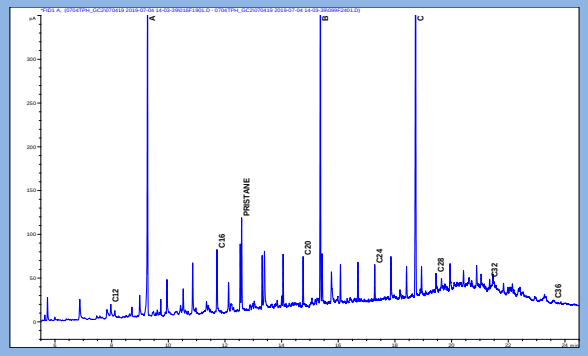

MAR00309.023
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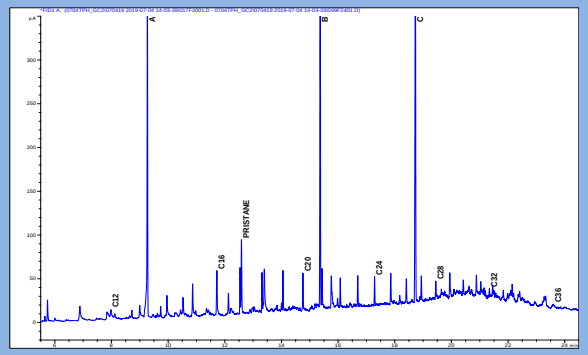

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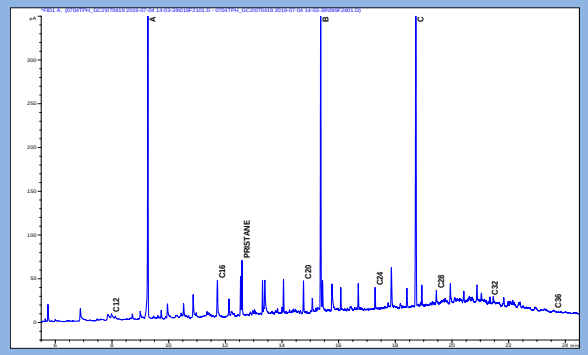

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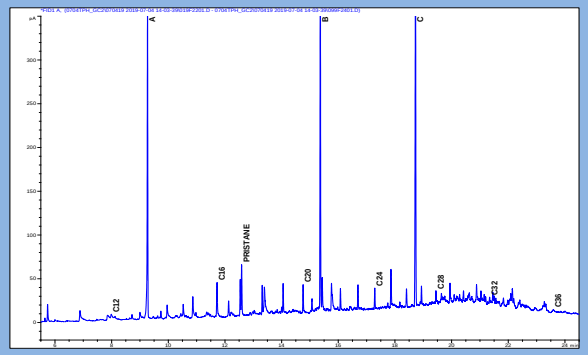

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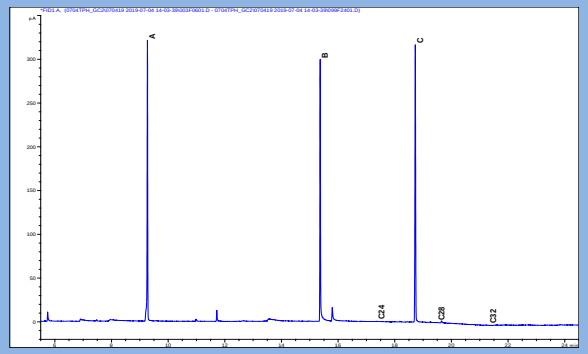

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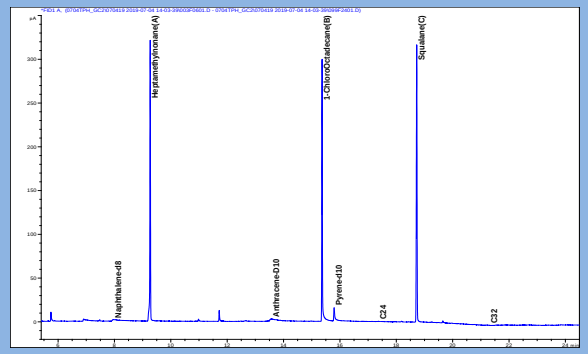

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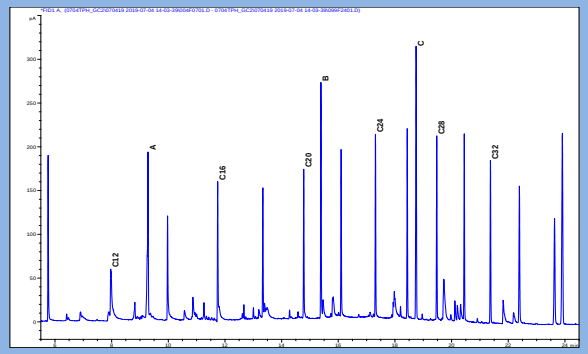

Reference Material

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Test Report ID MAR00309
Issue Version 2
Customer Reference BSL-1908 Orsted HOW3 & 4

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR00309.001-026	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/301	MAR00309.001-026	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with Monobutyltin falling above acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. These circumstances should be taken into consideration when utilising the data.
ASC/SOP/301	MAR00309.003, 004, 012	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted to improve the signal to noise ratio but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR00309.001-026	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.
ASC/SOP/303/306	MAR00309.001-026	Peak at ~ 8.85 minutes near C13 on the WMF files ID on the GCMS as Indole at <50% match quality. Peak at ~17.9.minutes just after c25 on the WMF files tentantively ID on the GCMS as 1,7-Dimethyl-4-(1-methylethyl)cyclodecane at <50% match quality.
ASC/SOP/303/306	MAR00309.001-026	Peak at ~11.7 is believed to be lab introduced and therefore removed from the results. Data is not believed to be effected.
SOCOTEC Env Chem*	MAR00310.001-007	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/301	MAR00310.001-007	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with Monobutyltin falling above acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. These circumstances should be taken into consideration when utilising the data.
ASC/SOP/301	MAR00310.006	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted to improve the signal to noise ratio but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR00310.001-007	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.
SOCOTEC Env Chem*	MAR00311.001-005	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ASC/SOP/301	MAR00311.001-005	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with Monobutyltin falling above acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR00311.002-005	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

Deviation Code	Devation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A

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Test Report ID	MAR00309
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Method	Sample and Fraction Size	Method Summary
Metals	Air dried and seived	Aqua Regia acid extraction followed by ICP analysis.
Loss on Ignition (LOI)	Air dried and ground	Determination of loss on ignition at 450°C by gravimetry
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment	Solvent extraction and clean up followed by GC-FID analysis.
Polychlorinated Biphenyls (PCBs)	Air dried and seived to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Appendix C - Gorham Test

Table 10: Low molecular weight Gorham test

ERL	552							
ERM	3160							
Stations	C1 Naphthalenes	Sum Naphthalenes	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	LMW (7ΣPAHS)
ECC_01	7.02	25.4	<1	<1	<1	5.98	<1	38.40
ECC_02	3.63	12.8	<1	<1	<1	2.19	<1	18.59
ECC_03	4.67	14.3	<1	<1	<1	2.68	<1	21.69
ECC_04	3.81	12.0	<1	<1	<1	3.27	<1	19.04
ECC_05	4.10	13.4	<1	<1	<1	2.56	<1	20.06
ECC_06	5.86	21.9	<1	<1	<1	3.64	<1	31.41
ECC_07	7.52	31.7	<1	<1	<1	4.67	<1	43.93
ECC_08	13.7	50.0	<1	<1	<1	7.46	<1	71.11
ECC_09	12.3	44.4	<1	<1	<1	8.09	<1	64.78
ECC_10	13.5	49.8	<1	<1	<1	8.06	<1	71.36
ECC_11	5.04	21.8	<1	<1	<1	4.59	<1	31.44
ECC_12	7.21	33.0	<1	<1	<1	5.08	<1	45.26
ECC_13	5.50	19.8	<1	<1	<1	2.75	<1	28.06
ECC_14	3.22	10.4	<1	<1	<1	1.61	<1	15.23
ECC_15	11.7	45.5	<1	<1	<1	9.25	<1	66.49
ECC_16	11.7	37.3	<1	<1	<1	6.42	<1	55.43
ECC_17	20.7	67.8	<1	<1	1.30	10.2	<1	99.98
ECC_18	97.5	360	1.92	3.52	6.12	58.5	6.00	533.49
ECC_19	227	721	5.06	10.3	18.5	93.1	15.0	1089.95
ECC_20	395	1439	6.75	17.7	29.1	258	30.3	2175.51
ECC_21	387	1207	7.11	15.6	29.2	149	24.0	1817.61
ECC_23	26.3	82.1	<1	<1	1.57	12.0	1.66	123.65
ECC_24	13.9	47.0	<1	<1	<1	6.39	<1	67.20
ECC_25	19.7	69.8	<1	<1	1.47	9.91	1.44	102.30
ECC_26	14.8	53.9	<1	<1	<1	7.65	<1	76.38
ECC_27	15.6	50.8	<1	<1	<1	8.73	3.50	78.57

Table 11: High molecular weight Gorham Test

ERL	1700						
ERM	9600						
Station	Fluoranthene	Pyrene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Dibenzo[a,h]anthracene	HMW (6ΣPAHS)
ECC_01	3.99	3.08	1.86	3.35	2.24	<1	14.53
ECC_02	2.38	1.69	<1	1.66	<1	<1	5.73
ECC_03	3.04	2.37	1.36	2.24	1.72	<1	10.73
ECC_04	2.95	2.24	1.35	2.25	1.78	<1	10.57
ECC_05	3.08	2.24	1.35	2.26	1.63	<1	10.56
ECC_06	3.75	2.82	1.60	2.75	2.06	<1	12.98
ECC_07	5.46	4.41	2.45	3.97	2.70	<1	18.99
ECC_08	7.89	6.14	3.58	5.80	4.00	1.32	28.73
ECC_09	5.94	4.69	2.69	4.59	2.87	<1	20.79
ECC_10	6.83	5.34	3.12	4.93	3.00	<1	23.23
ECC_11	4.33	3.41	2.02	3.33	2.22	<1	15.30
ECC_12	4.53	3.66	2.16	3.45	2.23	<1	16.03
ECC_13	3.42	2.61	1.51	2.38	1.81	<1	11.73
ECC_14	2.66	1.86	1.08	1.85	<1	<1	7.46
ECC_15	7.92	6.10	3.31	5.20	2.99	<1	25.53
ECC_16	4.23	3.34	2.02	3.65	2.17	<1	15.41
ECC_17	6.22	6.39	3.42	5.25	3.33	<1	24.61
ECC_18	29.12	30.29	18.20	25.14	17.59	3.58	123.92
ECC_19	82.44	75.45	49.07	58.32	46.48	9.65	321.43
ECC_20	156.73	156.34	92.96	117.40	81.67	14.27	619.37
ECC_21	117.55	108.34	73.09	88.28	67.07	13.28	467.61
ECC_23	8.45	7.88	4.63	6.46	4.14	<1	31.55
ECC_24	9.25	9.30	3.85	7.55	3.34	<1	33.28
ECC_25	8.81	8.65	4.40	7.15	4.28	<1	33.28
ECC_26	7.01	7.50	3.30	6.18	3.12	<1	27.11
ECC_27	15.92	14.49	8.66	11.43	8.30	1.52	60.32