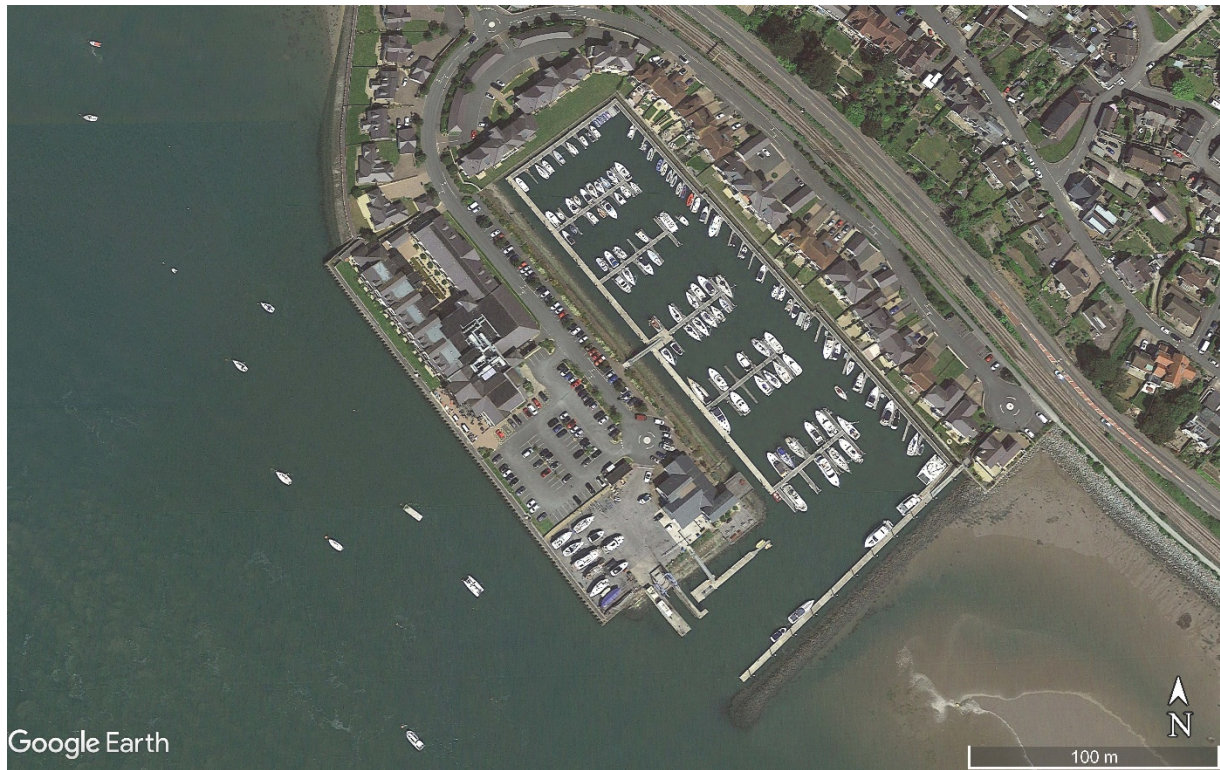




Habitats Regulations Assessment

Maintenance Dredging at Deganwy Marina

October 2019

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Appendix A Sediment sampling results April 2019

Document history

Report reference	Date	Comments
P2018-14-HRA-R1	12 September 2019	Draft issued for client review
P2018-14-HRA-R2	3 October 2019	Final issue

1. Introduction

Deganwy Marina on the Conwy River/Estuary in Wales is operated by Lakeland and Leisure Estates. Maintenance dredging has been carried out within the marina for several years using a cutter suction dredger. The current application is to dredge the same volume of material using a water injection dredger.

This Habitats Regulations Screening Assessment considers the ongoing maintenance dredging activity in terms of likely significant effects upon Natura 2000 sites, both alone and in combination with other plans and projects.

2. Requirement for a Habitats Regulations Assessment (HRA)

The European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) protects habitats and species of European nature conservation importance. The Habitats Directive establishes a network of internationally important sites designated for their ecological status. These are referred to as Natura 2000 sites or European Sites, and comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SPAs are classified under the Council Directive 79/409/EEC on the conservation of wild birds, the 'Birds Directive'.

The Conservation (Natural Habitats, &c.) Regulations 1994 in England and Wales transposed the Habitats Directive into national law. The Conservation of Habitats and Species Regulations 2010 consolidated the various amendments made to the 1994 Regulations.

Articles 6 (3) and 6 (4) of the Habitats Directive require HRA to be undertaken on proposed plans or projects which are not necessary for the management of the site but which are likely to have a significant effect on one or more Natura 2000 sites either individually, or in combination with other plans and projects.

There are four stages of the HRA process, as described in Table 1 (The Planning Inspectorate, 2017). The purpose of HRA is to assess the impacts of a project, in combination with the effects of other plans and projects, against the conservation objectives of a Natura 2000 site and to ascertain whether it has likely significant effects (Stage 1 – Screening). If no likely significant effects are predicted on Natura 2000 sites, there is no need for an Appropriate Assessment to be carried out. If effects are judged likely or uncertainty exists, the precautionary principle applies and an Appropriate Assessment is required to determine if the plan would adversely affect the integrity of the Natura 2000 site(s) (Stage 2). Where there are adverse impacts, an assessment of mitigation options is carried out, and if these mitigation options cannot avoid adverse effects then development consent can only be given if Stages 3 and 4 are followed.

Table 1 Four stage process to the HRA

Stage 1	Screening	The process to identify the likely impacts of a project upon a European site, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.
Stage 2	Appropriate Assessment	The consideration of the impacts on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects then development consent can only be given if stages 3 and 4 are followed.
Stage 3	Assessment of alternative solutions	Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on European sites.
Stage 4	Imperative reasons of over-riding public interest (IROPI)	This is the assessment where no alternative solution exists and where adverse impacts remain. The process to assess whether the development is necessary for IROPI and, if so, the potential compensatory measures needed to maintain the overall coherence of the site or integrity of the European site network.

3. Description of the Project

Maintenance dredging within Deganwy Marina has been on-going for several years. The dredge area and volume are the same as previously licensed by Natural Resources Wales (NRW). The only difference is the dredging method to be used: previously material was dredged using a cutter suction dredger and material was deposited in the River Conwy close to the marina, and the current proposal is to carry out Water Injection Dredging (WID).

The WID plant consists of a small floating pontoon with a powerful water pump and injection arm attached. The pontoon is manoeuvred by its own propulsion system or attached tug. The injection arm is passed over the area to be dredged as the pontoon is manoeuvred and the height of the injection arm is controlled. The system involves high volume but low pressure water being injected into the sediments on the bed of the marina. The low pressure injection fluidises the sediments which will then flow as a dense fluid via natural seabed gradients out of the marina towards lower bed levels. The density flow enters only the lower fraction of the water column. There is no disposal site required for WID.

4. HRA Screening Assessment

4.1. Step 1: Identify and acquire information about designated sites

There is one Natura 2000 site in proximity to Deganwy Marina: Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC is approximately 800 m from the entrance to the marina. Table 2 describes the Menai Strait and Conwy Bay SAC and its conservation objectives.

Table 2 Menai Strait and Conwy Bay SAC Site Summary

Site description	The physiographic conditions make this an unusual site, which has long been recognised as important for marine wildlife. The variation in physical and environmental conditions throughout the site, including rock and sediment type, aspect, water clarity and exposure to tidal currents and wave action result in a wide range of habitats and associated marine communities. Many of these community types are unusual in Wales. Of particular interest is the environmental and physical conditions and associated marine communities from the tide-swept, wave-sheltered narrows of the Menai Strait to the more open, less tide-swept waters of Conwy Bay and the moderately wave-exposed Great and Little Ormes.
Distance to site	800 m
Qualifying features	<u>Annex I habitats that are a primary reason for site selection</u> • Mudflats and sandflats not covered by seawater at low tide • Reefs • Sandbanks which are slightly covered by seawater all the time <u>Annex I habitats present as a qualifying feature, but not a primary reason for site selection</u> • Large shallow inlets and bays • Submerged or partially submerged sea caves
Condition assessment	Condition assessments of the qualifying features were carried out by NRW in 2018¹: • Mudflats and sandflats not covered by seawater at low tide: Favourable • Reefs: Favourable • Sandbanks which are slightly covered by seawater all the time: Favourable

¹ <https://cdn.naturalresources.wales/media/684384/menai-strait-and-conwy-bay-sac-ica-2018.pdf>

	• Large shallow inlets and bays: Unfavourable • Submerged or partially submerged sea caves: Unknown
Conservation objectives ²	<u>Range</u> The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. For the intertidal mudflats and sandflats feature these include: • Muddy gravel communities • Dwarf eelgrass, <i>Zostera noltei</i> beds • Sediment communities at Traeth Lafan For the reef feature these include: • Reef communities in high energy wave-sheltered, tide-swept conditions • Under-boulder, overhang and crevice communities • Limestone reef communities • Clay outcrop reef communities For the large shallow bay feature these include: • Organically enriched muddy sediment areas <u>Structure and function</u> The physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. Important elements include: • Geology • Sedimentology • Geomorphology • Hydrography and meteorology • Water and sediment chemistry • Biological interactions This includes a need for nutrient levels in the water column and sediments to be: • At or below existing statutory guideline concentrations • Within ranges that are not potentially detrimental to the long term maintenance of the features species populations, their abundance and range. Contaminant levels in the water column and sediments derived from human activity to be: • At or below existing statutory guideline concentrations • Below levels that would potentially result in increase in contaminant concentrations within sediments or biota

² <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/conservation-advice-for-european-marine-sites/?lang=en>

	- Below levels potentially detrimental to the long-term maintenance of the feature species populations, their abundance or range taking into account bioaccumulation and biomagnification. Restoration and recovery This includes the need for restoration of some reef features such as underboulder, overhang and crevice communities, and of some mudflat and sandflat features such as the muddy gravel habitats and sheltered muddy habitats. All of these habitats are also part of the large inlets and bays feature. <u>Typical Species</u> The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include: - Species richness - Population structure and dynamics - Physiological health - Reproductive capacity - Recruitment - Mobility - Range
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4.2. Step 2: Identify likely significant effects

4.2.1. Assessment methodology

European case law has ruled that the question of whether an effect would be 'significant' is linked to the site's conservation objectives. Under this test:

- A 'significant effect' only includes effects which would undermine a European site's conservation objectives, for example by reducing the area or quality of protected habitat for which the site was designated, or by the disturbance or displacement of species for which the site was designated;
- A plan or project with effects which do not impact on a European site's conservation objectives would not be considered to be 'significant' for the purpose of this decision. For example, this might be the case for low-impact temporary effects, or effects such as the loss of a small area of land which is not an interest feature of the site and has no effect, or an insignificant effect, on the habitat or species which are interest features.

European case law has interpreted the threshold of 'likelihood' of significant effects at a low level. Accordingly, a plan or project must be considered to be 'likely to have a significant effect' where it cannot be excluded on the basis of objective information that the plan or project will have significant effects on the site concerned. In other words, if it may have a significant effect, an appropriate assessment should be carried out.

4.2.2. Assessment of likely significant effects

To assess whether the maintenance dredging activity will have likely significant effects on the interest features of the Menai Strait and Conwy Bay SAC, a screening matrix has been produced and is presented in Table 3. To avoid unnecessary repetition, qualifying habitats have been grouped together where pressures/effects are likely to be similar.

Table 3 Menai Strait and Conwy Bay SAC Screening Matrix

Qualifying features	Operations (pressures) which may cause deterioration or disturbance	Assessment of likely significant effects resulting from maintenance dredging
• Mudflats and sandflats not covered by seawater at low tide • Sandbanks which are slightly covered by seawater all the time • Reefs • Large shallow inlets and bays	Physical loss of habitat (direct or indirect) Example activities: • Removal of habitat feature • Smothering	The qualifying mudflats and sandbanks of the SAC are 800m from the dredge area at their closest point. There are no known reef habitats within several kms of the dredge area. There will be no direct loss of any qualifying habitat as a result of the maintenance dredging. Indirect loss of habitat could occur when dredged material disperses in suspension out of the Conwy River towards the qualifying habitats in the estuary. Maintenance dredging has been ongoing for several years and the dredge area and volume are unchanged. The only difference is the dredging method to be used: previously material was dredged using a cutter suction dredger and deposited in the River Conwy close to the marina, whereas the current proposal is to use WID, as described in Section 2. The cutter suction dredging operation deposited material at a dispersive beneficial use site just outside the marina entrance. Monitoring of intertidal silt levels was undertaken between 2010-14 to ascertain whether silt content had increased in the intertidal areas of the estuary as a result of maintenance dredging and deposition in the river³. The study notes that the estuarine system is highly dynamic with evidence of rapid sediment transportation processes. The study found no evidence of increased silt content in intertidal areas, and concluded that the activity had no adverse effects on these habitats. The change from cutter suction to WID does not significantly affect the suspended sediment generated by the activity: the beneficial use deposition site is dispersive, so there are no significant differences predicted in the dispersal of dredged material using the WID technique, i.e. the same volume of material enters the river/estuary at a very similar location. No likely significant effects.

³ Land & Water (2014) Deganwy and Conwy Quay Marina environmental monitoring report relating to cutter suction dredging programme 2013-2014.

	Toxic contamination Example activities: • Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs) • Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	On 26th April 2019, sediment samples were collected at two locations within the dredge area, both at the surface and at 1.5 m below the surface. Samples were analysed for heavy metals, organotins and total hydrocarbons, in accordance with NRW's requirements. The results are presented in Appendix A. The samples reveal no exceedances of Cefas Action Level 2 for any parameters tested. Elevations above Action Level 1 were revealed for some heavy metals but well below Action Level 2 in all cases. There were no elevations above Action Level 1 for organotins. The chemical quality of the dredged material is regularly tested and has been deemed suitable for sea disposal by NRW and Cefas for many years. The most recent samples collected in 2019 are deemed suitable for disposal at sea. The risk of contaminants from the maintenance dredging activity affecting the structure and function of the qualifying habitats is extremely low. No likely significant effects.
• Submerged or partially submerged sea caves	Physical loss of supporting habitat (direct or indirect) Example activities: • Removal of habitat feature • Smothering	There are no known sea caves within several kms of the dredge area. Maintenance dredging within the Conwy River is highly unlikely to affect the structure and function of sea caves. No likely significant effects.
	Toxic contamination Example activities: • Introduction of synthetic compounds (e.g. pesticides, TBT, PCBs) • Introduction of non-synthetic compounds (e.g. heavy metals, hydrocarbons)	Same assessment as for qualifying habitats listed above. No likely significant effects.

4.3. *In-combination effects*

As part of the screening for likely significant effects, the effects of a plan or project must be considered both individually and in combination with other relevant plans or projects. This is a requirement of the Habitats Directive which helps ensure that European sites are not damaged by the additive effects of multiple plans or projects. The in-combination assessment should take account of all current and proposed plans or projects where planning permission (or a similar regulatory consent) has been applied for or granted. It is not necessary to take account of plans or projects for which there have been no formal applications under an approvals process.

No projects have been identified, either consented or within the planning system, that have the potential for in-combination effects with the ongoing maintenance dredging at Deganwy Marina.

5. **Aber Afon Conwy Site of Special Scientific Interest**

The River Conwy adjacent to Deganwy Marina is part of the Aber Afon Conwy Site of Special Scientific Interest (SSSI). Whilst this is not a Natura 2000 site, for completeness the potential effects of maintenance dredging on this site have been considered.

The site is of special interest for its marine and terrestrial invertebrate biology. The tidal reach of the site extends approximately 16km, encompassing Conwy Bay between Penmaenbach Point and Great Orme's Head at its seaward limit, to its upstream boundary south of Tal y Cafn. The shoreline is backed by natural rock and boulder clay cliff, sand dune, salt marsh and woodland, with artificial substrate and sea defence walls forming the boundary throughout the remainder of the estuary.

The key management issues identified by NRW⁴ that could be affected by maintenance dredging are described in Table 4.

In summary, the ongoing maintenance dredging at Deganwy Marina is highly unlikely to affect the interest features of the SSSI.

⁴ <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en>

Table 4 Aber Afon Conwy SSSI key management issues

Management issue	Description of issue	Potential effects of maintenance dredging at Deganwy Marina
Coastal processes and river discharge	Natural coastal processes throughout Conwy Bay and in combination with natural river flow within upstream sections of the estuary, promote the variety of habitat and species groups found within the Conwy estuary. Estuaries are areas of mixing in terms of the salinity of the water and the movement of sediments. As the tide recedes, large areas of sediment or rock foreshore are left exposed to the elements. Consequently, most of the habitats and species found in the Conwy estuary are fairly hardy, with their distribution being particularly influenced by their respective abilities to withstand, tolerate or avoid periods of changing salinity or exposure. Existing distributions of habitats and species are maintained by fundamentally natural processes.	Deganwy Marina is an existing facility and no changes are proposed to the infrastructure (including the maintained dredge depth). As noted in Table 3, monitoring of intertidal silt levels was undertaken between 2010-14 to ascertain whether silt content had increased in the intertidal areas of the estuary as a result of maintenance dredging and deposition in the river. The study notes that the estuarine system is highly dynamic with evidence of rapid sediment transportation processes. The study found no evidence of increased silt content in intertidal areas, and concluded that the activity had no adverse effects on these habitats. The maintenance dredging activity is expected to have negligible effects on coastal processes. There is no mechanism for the dredging to affect river discharge.
Habitat loss	Potentially, a major threat to the maintenance of the special features is the permanent loss of intertidal habitat through 'land claim' for urban, transport or recreational infrastructure or for agricultural use. Historically, many sections of Conwy Bay and the estuarine river channel have had artificial sea defences built to protect land from flooding. These measures decrease the natural expansion of intertidal habitats and species, thus reducing the potential for natural regeneration. This factor makes the	There will be no habitat loss within the SSSI as a result of the maintenance dredging.

	continued survival of habitats and species a greater priority. NRW acknowledge the need for future protection of small areas of coastline identified in the shoreline management plan; however, NRW will work with the statutory authorities, developers and local landowners to ensure that no further loss of habitat occurs through inappropriate development plans.	
Recreational pressure	Recreational pursuits in the vicinity of the Conwy estuary include passive activities such as walking and bird watching, through to more active pursuits such as angling and a variety of boating activities including sailing, water skiing and jet skiing. For instance, there are over 700 marina berths and at least 800 hundred other boats either moored or launched in the Conwy estuary, however their usage is at high water, when most of the intertidal features are covered and thus not affected. Although excessive recreational pressure could affect the ecological features of the site, present levels of disturbance do not appear to impinge upon the features of scientific interest. NRW wish to liaise with statutory authorities and third party user groups to ensure that disturbance to sensitive areas within the intertidal is avoided.	Deganwy Marina is an existing facility. The maintenance dredging allows the marina to remain operational. NRW recognises that present levels of disturbance due to recreational activities do not appear to impinge upon the features of scientific interest.

6. Conclusion of HRA Screening Assessment

This HRA Screening Assessment has considered the ongoing maintenance dredging at Deganwy Marina in terms of likely significant effects upon Natura 2000 sites, both alone and in-combination with other plans and projects, and concluded that there will be no likely significant effects.

7. References

The Planning Inspectorate (2017). Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects. Version 8, November 2017.

Appendix A: Sediment sampling results April 2019

Mark Morgan
Lakeland Leisure Estates Ltd
Lakeland Leisure Estates Ltd
The Studio
Station Road
Staveley
Cumbria
LA8 9NB

Dear Mark

Please find attached the results for the batch of 4 samples described below.

Samples Registered on:	01-May-2019
Analysis Started on:	01-May-2019
Analysis Completed on:	30-May-2019
Results for Batch Number	20130933
Your Purchase Order Number:	1246

You will be invoiced shortly by our accounts department.

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

Yours sincerely



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

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation. Details of analytical procedures and performance data are available on request. The date of sample analysis is available on request.

The Environment Agency carries out analytical work to high standards and within the scope of its UKAS accreditation, but has no knowledge of whether the circumstances or the validity of the procedures used to obtain the samples provided to the laboratory were representative of the need for which the information was required.

The Environment Agency and/or its staff does not therefore accept any liability for the consequences of any acts or omissions made on the basis of the analysis or advice or interpretation provided.

Client: Lakeland Leisure Estates Ltd Project: Sediment analysis
Quote Description: Deganwy Marina - Sediment analysis
Folder No: 004363742 Sampled on: 26-Apr-19 @ 11:53
Comments: Site A - 0m
Quote No: 15544 Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Hydrocarbons : Total : Dry Wt as Ekofisk	322	mg/kg		0.9	None	LE	402
Mercury : Dry Wt	0.145	mg/kg	DC	0.01	UKAS	LE	1042
Arsenic : Dry Wt	16.3	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.563	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	56.9	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	25.3	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	46.4	mg/kg		2	UKAS	LE	1041
Nickel : Dry Wt	30.6	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	228	mg/kg		2.5	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<9	ug/kg		3	UKAS	LE	897
ELEVATED_MRV : Dry weight calculation							
Tributyl Tin : Dry Wt as Cation	3.13	ug/kg		1	UKAS	LE	897
Dry Solids @ 30°C	30.2	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Ball Milled & Sieved to <2mm							

Client: Lakeland Leisure Estates Ltd Project: Sediment analysis
Quote Description: Deganwy Marina - Sediment analysis
Folder No: 004363743 Sampled on: 26-Apr-19 @ 11:55
Comments: Site A- 1.5m
Quote No: 15544 Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Hydrocarbons : Total : Dry Wt as Ekofisk	254	mg/kg		0.9	None	LE	402
Mercury : Dry Wt	0.159	mg/kg	DC	0.01	UKAS	LE	1042
Arsenic : Dry Wt	18.4	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.642	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	66.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	29.0	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	49.7	mg/kg		2	UKAS	LE	1041
Nickel : Dry Wt	35.0	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	246	mg/kg		2.5	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<8	ug/kg		3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<3	ug/kg		1	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Dry Solids @ 30°C	33.1	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
	No additional material						
Drying Method	Report	Text			None	LE	924
	Air dried at 30°C						
Rejected Matter Description	Report	Text			None	LE	924
	No material removed						
Sample Colour	Report	Text			None	LE	924
	Brown						
Sample Matrix	Report	Text			None	LE	924
	Clay Sediment						
Sample Preparation	Report	Text			None	LE	924
	Homogenised, Ball Milled & Sieved to <2mm						

Client: Lakeland Leisure Estates Ltd Project: Sediment analysis
Quote Description: Deganwy Marina - Sediment analysis
Folder No: 004363744 Sampled on: 26-Apr-19 @ 11:46
Comments: Site B - 0m
Quote No: 15544 Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Hydrocarbons : Total : Dry Wt as Ekofisk	234	mg/kg		0.9	None	LE	402
Mercury : Dry Wt	0.0763	mg/kg	DC	0.01	UKAS	LE	1042
Arsenic : Dry Wt	12.0	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.603	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	36.5	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	15.7	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	32.8	mg/kg		2	UKAS	LE	1041
Nickel : Dry Wt	20.3	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	185	mg/kg		2.5	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<6	ug/kg		3	UKAS	LE	897
ELEVATED_MRV : Dry weight calculation							
Tributyl Tin : Dry Wt as Cation	4.33	ug/kg		1	UKAS	LE	897
Dry Solids @ 30°C	45.7	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Ball Milled & Sieved to <2mm							

Client: Lakeland Leisure Estates Ltd Project: Sediment analysis
Quote Description: Deganwy Marina - Sediment analysis
Folder No: 004363745 Sampled on: 26-Apr-19 @ 11:48
Comments: Site B -1.5m
Quote No: 15544 Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Hydrocarbons : Total : Dry Wt as Ekofisk	169	mg/kg		0.9	None	LE	402
Mercury : Dry Wt	0.114	mg/kg	DC	0.01	UKAS	LE	1042
Arsenic : Dry Wt	11.9	mg/kg		1	UKAS	LE	1041
Cadmium : Dry Wt	0.493	mg/kg		0.04	UKAS	LE	1041
Chromium : Dry Wt	42.1	mg/kg		2	UKAS	LE	1041
Copper : Dry Wt	17.5	mg/kg		1	UKAS	LE	1041
Lead : Dry Wt	30.7	mg/kg		2	UKAS	LE	1041
Nickel : Dry Wt	21.5	mg/kg		1	UKAS	LE	1041
Zinc : Dry Wt	169	mg/kg		2.5	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<7	ug/kg		3	UKAS	LE	897
ELEVATED_MRV : Dry weight calculation							
Tributyl Tin : Dry Wt as Cation	2.98	ug/kg		1	UKAS	LE	897
Dry Solids @ 30°C	45.2	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text			None	LE	924
No additional material							
Drying Method	Report	Text			None	LE	924
Air dried at 30°C							
Rejected Matter Description	Report	Text			None	LE	924
No material removed							
Sample Colour	Report	Text			None	LE	924
Brown							
Sample Matrix	Report	Text			None	LE	924
Clay Sediment							
Sample Preparation	Report	Text			None	LE	924
Homogenised, Ball Milled & Sieved to <2mm							

Method Description Summary for all samples in batch Number 20130933

- 402 LE I Hydrocarbons by fluorescence
- 897 LE O Organotins (GCMS) 01 - acetic acid/methanol extracted; derivatised; determined GCMS (SIM); from "as received" sample
- 924 Sample Preparation; Dry Solids (30°C); from "as received" sample
- 1041 LE M Metals ICP-MS Sediment - microwave aqua regia digested, determined by ICPMS, samples are sieved to <2000µm.
- 1042 LE M Mercury CSEMP - microwave aqua regia digested, acidic SnCl₂ reduced, determined by CV-AFS. Samples are sieved to <2000µm.
- 1130 LE P Soil Preparation 01: The sample is air-dried at <30°C in a controlled environment until a constant weight is achieved.



Steve Moss
Laboratory Site Manager

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

All reporting limits quoted are those achievable for clean samples of the relevant matrix. No allowance is made for instances when dilutions are necessary owing to the nature of the sample or insufficient volume of the sample being available. In these cases higher reporting limits may be quoted and will be above the MRV.

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

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

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

Key to Results Flags:

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

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

Please note all samples will be retained for 10 working days for aqueous samples and 30 working days for solid samples after reporting unless otherwise agreed with Customer Services

Key to Accreditation: UKAS = Methodology accredited to ISO/IEC 17025:2005, MCertS = Methodology accredited to MCertS Performance Standard for testing of soils, none = Methodology not accredited

Key to Lab ID: LE = Leeds, NM = Nottingham, SX = Starcross, SC = Sub-Contracted outside NLS, FI = Field Data - outside NLS, NLS = Calculated

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

END OF TEST REPORT