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22<sup>nd</sup> August 2005.

For the attention of: Mr. Jonathan Lewis, Project Manager, Emu Ltd, Head Office,  
1 Mill Court, The Sawmills, Durley, Southampton, Hampshire SO32 3EJ.

Dear Mr. Lewis,      Application for Government View : Area 401/2 Licence Renewal.

Thank you for your letter, ref. J/1/06/0786/JXL/20, dated 29<sup>th</sup> July 2005 which outlined your response to our submission dated 24<sup>th</sup> March 2005 in connection with the formal consultation process concerning the application by Hanson Aggregates Marine Limited for an aggregate extraction licence renewal for Area 401/2 (Great Yarmouth). Thank you also for copies of the additional Technical Notes in respect of this application.

We should like to comment further in respect of your reply dated 29<sup>th</sup> July 2005.

Need for the Resource.

If the supply of sand and gravel from Area 401/2 is exclusively for concrete production, and is required to meet quality standards in concrete production, then the case for the extraction of this resource from Area 401/2 is strengthened.

However in your letter of 29<sup>th</sup> July 2005 and Technical Note 2 this claim is not made. Consequently, we must assume that part of the annual extraction from Area 401/2 is therefore going to uses other than concrete production.

It remains our contention that this usage (i.e. other than concrete production) is capable of substitution by a combination of recycled aggregate, secondary aggregate, land-based quarries within the South-East region, and other UK land quarries. Hence with regard to aggregate for non-concrete production, there is no clear need for a relicensing of Area 401/2; and in respect of concrete production, it is still unclear to us why other marine licences in the Great Yarmouth block cannot meet this need.

Your reply of 29<sup>th</sup> July has not addressed this issue as we have defined it, and has therefore not demonstrated that the sand and gravel extracted from Area 401/2 is essential to the aggregate needs of London , South-East England and Eastern England; and hence, that the specific aggregate demand which Area 401/2 is currently supplying cannot be sourced from elsewhere.

Similarly, your reply has not demonstrated that the sand and gravel exported to The Netherlands is exclusively for concrete production, and therefore meets an essential need of that country.

There is a strong case to argue, in our opinion, that the aggregate licence for Area 401/2 should be directly and exclusively linked to sand and gravel for concrete production, and the extraction licence (tonnage) calculated on this basis. At present, the level linked to concrete production has not been declared in the Environmental Statement and subsequent Technical Notes.

**Accordingly it is our Recommendation for Government View:**

**It has not been clearly established that there is a need for Area 401/2 to be relicensed in order to meet the aggregate needs of the South East region. Alternative land-based sources of supply exist, especially with regard to non-concrete production, and it has not been demonstrated in the Environmental Statement that any shortfall in the overall supply of aggregate for concrete production could not be met by existing marine licences.**

**In respect of supply to The Netherlands, it is our opinion that The Netherlands is able to meet its own requirements for marine aggregate and it has not been demonstrated that aggregate supplied from Area 401/2 is exclusively for concrete production. There is therefore no need for Area 401/2 to be relicensed in order to meet an export demand from this country.**

Physical Nature of the Seabed.

We greatly welcome and appreciate the additional information regarding the Physical Processes at Area 401/2 provided in Technical Note 1, and in particular the distinction between the seabed surface dune system and the underlying deposit of sand and gravel originating from the last glacial period. This is a most helpful clarification.

We also appreciate the commitment to ensure that at least 0.5 metres of sand and gravel remains overlying bedrock on the seabed in order to enable the marine benthos to recover, thus fulfilling the requirement of MMG1 “to leave the seabed in a similar physical condition to that present before dredging started.”

However, we must take exception to the statement in your letter of 29<sup>th</sup> July 2005 that “companies maintain a store of resource information but supply of this information to the wider public is not possible as it is commercially sensitive”.

We observe:

1. If we do not know the size (depth) of the resource it is not possible to establish the reasonableness or otherwise of the extraction rate that is being proposed.
2. Given that this is a re-licensing application, it is important to know the rate of depletion of the resource over the previous licence period (10 years). We are then in a position to properly evaluate issues of sustainability; and similarly, without this information, no sustainability appraisal can be properly undertaken.

3. The resource (the amount of sand and gravel underlying the seabed surface dune system) is a resource that belongs not to the company (Hanson Aggregates Marine Limited) but rather to the nation through the Crown Estate. This resource is not the property of the company. The company merely holds a licence to extract it.

4. Given that this resource is not the property of the company, and is rather the property of the nation through the Crown Estate, in our view it is wholly unreasonable for the company to fail to publicly declare the size of this resource on the grounds of commercial sensitivity. Additionally, the company holds the sole licence to extract aggregate in Area 401/2, so where is the commercial competitor ?

**Accordingly, it is our Recommendation for Government View:**

**No re-licensing of this site should be determined until the full size of the resource has been declared by the company, thus enabling issues and decisions regarding sustainability to be properly determined.**

Coastal Impact Study.

In our submission of 24<sup>th</sup> March 2005 we provided a detailed critique of the Coastal Impact Study undertaken by the applicant's consultant, H. R. Wallingford Ltd.

In particular, we demonstrated a serious failure by the consultant's study to assess the nature of the offshore sandbanks in the historical period running from pre-dredging (post World War II) to today, along with the changes that have occurred to this offshore sandbank system in this historical period and the causes for these changes; and, we demonstrated serious deficiencies in the factual basis of the wave model employed in the consultant' study.

These matters are of fundamental importance because the offshore sandbanks are the primary sea "defence" for the coastal area, and the nature of the offshore wave regime is a major determinant in the character and stability of the offshore sandbanks.

**It is therefore with some concern that we note that neither your letter of 29<sup>th</sup> July 2005 nor its accompanying Technical Notes have addressed any of the issues that we detailed in our submission of 24<sup>th</sup> March 2005.**

Accordingly, we have appended the full text (Appendix I) of this section of our submission of 24<sup>th</sup> March 2005 to this letter, and we assert that it would be unsound to re-licence aggregate extraction on Area 401/2 until you and the company's consultant, H. R. Wallingford Ltd, have responded in detail to the serious deficiencies which we have identified in the Coastal Impact Study which accompanies the re-licensing application.

There is little point in us making further comment on this matter until you have responded to us and the Government View procedure in this manner.

**Accordingly, it is our Recommendation for Government View:**

**Re-licensing of Area 401/2 should not be granted until the applicant has undertaken a full and satisfactory assessment of the impact of dredging on the offshore sandbanks and has**

**properly assessed whether the changes in the nature of these sandbanks is leading to an alteration in the height and velocity of waves arriving on the coastline.**

In our submission of 24<sup>th</sup> March 2005 we also made a Recommendation for the Government View procedure that Area 401/2 should not be relicensed until the UK Government has applied the EU Strategic Environmental Assessment Directive (2001/42) to the East Coast (Great Yarmouth) block of licences.

We note from your letter of 20<sup>th</sup> July 2005 that:

1. You assert that the UK Government has applied the EU Strategic Environmental Assessment Directive to the East Coast (Great Yarmouth) block of licences.
2. Your Technical Note 6, sections 3 and 7, records the view of Hanson Marine Aggregates Limited (HAML) that there should be a major review of **all** marine aggregate extraction in the Great Yarmouth block in 2013, that HAML are committed to taking part in this review, and that this review “*would allow a complete reassessment of the dredging activities in this area which ideally should be supported by a Regional Environment Assessment (as undertaken in the East English Channel)*” ref. section 3, p.5.

We observe as follows:

We are not aware that a Strategic Environmental Assessment in accordance with EU Directive 2001/42 has been undertaken by the UK Government, and as far as we are aware no reference to such a Strategic Environmental Assessment is made in your Environmental Statement of January 2005. Accordingly, we would be grateful if you would clarify your assertion and provide us with the appropriate references and documentation.

We are not aware of any formal commitment between the aggregate extraction licence holders and the UK Government to undertake a major review of all marine aggregate extraction in the Great Yarmouth block in 2013, nor of the terms of reference of such a review. As a result, we would be grateful if you would clarify this assertion and provide us with the appropriate references and documentation. We should also be interested to receive your advice regarding the reasoning as to why this major review should be delayed until 2013, rather than be commenced immediately.

**Accordingly, we reserve further comment on these two matters under the Government View Procedure until you have advised us as requested above.**

Plume Study.

The basis of our objection to the Plume Study carried out for Area 401/2 has been:

1. The Plume Study for Area 401/2 is using the Plume Study for Area 254 as a proxy i.e. extrapolating from the conclusions reached regarding Area 254 and then applying them to Area 401/2 on the basis that the two dredging areas are essentially similar.
2. The Plume Study for Area 254 was simply a computer model, using synthesised data, and therefore had no empirical or factually verified basis with respect to its conclusions.

Accordingly, it has been our view that the Plume Study for the re-licensing of Area 401/2 is wholly inadequate. This is particularly so given that Area 401/2 holds a licence that has been operating for several years, and therefore the opportunity to collect empirical data to validate the Plume Study has been readily available. However the licence holder, Hanson Marine Aggregates Limited, has declined/neglected to do so, and now in the absence of this factual data relies on a computer model used at another site in the Great Yarmouth Block which, in turn, has no empirical data either.

Moreover, given that two-thirds of the dredged material from Area 401/2 is being returned overboard from the dredger (Reference: ES, Appendix E, section 5.2), we find the claim to be most dubious that “*No significant permanent deposition of fine sediment is predicted by the model. Temporary deposition of fine sediment is predicted to be less than 0.5 mm in thickness for both spring and neap tide conditions*” (Reference: ES, Appendix E, section 5.1.(4)).

In reality two-thirds of every tonne extracted is being returned, and the applicant is claiming that the overwhelming majority of this material is being returned to the seabed within 300 metres of the dredged area (Reference: ES, Appendix E, section 6 (i) and (ii)). If this is so, would not the deposited material be greater than 0.5 mm ?

It seems to us that it is most important to verify this assertion, and the actual truth of the matter. Particularly so given that the current Environmental Statement is asserting that the marine benthos outside the immediate dredged locality in Area 401/2 is not being smothered by plume material and, although its abundance has been reduced during the current licence period, it has still been able to maintain its biodiversity (Reference: EMU letter 29<sup>th</sup> July 2005, page 5, section on Plume Study).

**Accordingly, we maintain our Recommendation for Government View:**

**In our opinion, the plume dispersion model is failing to accurately predict the deposition character and depth of dredged material returned to sea. We have seen no evidence that its prediction of 0.5mm sediment deposition is accurate, and what evidence does exist suggests the contrary. Accordingly, we believe that no new licence should be granted until the plume dispersion model has been empirically tested and validated.**

Biological and Ecological Impact.

As the applicant has noted in the original Environmental Statement, a key issue in the decision whether to relicence Area 401/2 is whether there are “compelling environmental disadvantages.” (ref. ES, Appendix C, section C.8). If such compelling environmental disadvantages exist, then the application to relicence would fail.

There are two areas which potentially fall into this category. The first is the impact of dredging on the coast (coastal impact study), and we have already detailed serious concerns in this regard which the applicant and its consultants have failed to address (see Appendix I to this letter). The second is the biological and ecological impact about which a wide range of concerns have been raised by both ourselves and other parties during the consultation process. We now comment further on our concerns, and the response of the applicant’s consultant (ref. EMU letter dated 29<sup>th</sup> July 2005 and accompanying Technical Notes).

Central to our concern is the fact that the applicant's January 2005 Environmental Statement makes little reference to the ecological structure of the marine community in Area 401/2 and offers a management regime during the licence period where this concept is largely absent. As we noted in our earlier submission, 24<sup>th</sup> March 2005, the need for an ecosystem approach in these matters has been articulated strongly by DEFRA in its publication *Safeguarding Our Seas, 2002*.

This absence of an ecosystem approach is a serious failure. However, in the applicant's favour there are two mitigating arguments. Firstly, knowledge of the marine ecosystem is still very limited and the extent of such knowledge of the marine ecosystem is certainly not comparable to its terrestrial counterpart. Therefore when the term ecosystem management is used, it has to be admitted that the term still possesses a great deal of imprecision. However, this should not be seen as a "get out of jail free card" and absolve the applicant of any attempt to employ an ecosystem approach to its environmental assessment and management regime. On the contrary, it should concentrate the mind. In particular, it places great emphasis on the need for the environmental assessment and management regime to proceed in a manner consistent with the precautionary principle (i.e. when a serious risk is believed to exist, but scientific knowledge is not yet capable of assessing the magnitude of that risk, then it is essential to proceed with precaution).

The second mitigating factor is that the applicant's consultant has responded to the criticism of ourselves, and others, that the Environmental Statement lacks a clear definition and deployment of the ecosystem approach to its methodology. In the consultant's response the following statement is made with regard to the use of the term "ecological structure" and the rate of recovery of the marine community in dredged areas:

'In responding to this comment it is important to firstly try and define the term "ecological structure". With respect to fish resources, we define ecological structure as, "*the habitats and species present in an area that are required to support and sustain fish resources at a satisfactory level*". [italics in the original] Ref. Technical Note 3, page 3, attached to EMU letter dated 29<sup>th</sup> July 2005.

Whilst this definition is helpful, it is still a long way short of the DEFRA definition of the ecosystem approach to environmental assessment and marine management. Namely:

*"An ecosystem-based approach to management represents a new and more strategic way of thinking. It puts the emphasis on a management regime that maintains the health of ecosystems alongside appropriate human use of the marine environment, for the benefit of current and future generations. This requires setting clear environmental objectives both at the general and specific level, basing management of the marine environment on the principles of sustainable development, conservation of biodiversity, robust science, the precautionary principle and stakeholder involvement."* Ref, *Safeguarding Our Seas*, section 1.17.

**Accordingly, we remain seriously concerned that the applicant and its consultants are still failing to make a serious attempt to adopt and employ the ecosystem approach.** In particular, the consultant's reply of 29<sup>th</sup> July 2005 makes no reference to the DEFRA approach, and even when they do apply the term "ecological structure" to an assessment of the impact on fisheries, the applicant and its consultant are still reluctant to accept the primary validity of our observation that an assessment of the impact of aggregate dredging on fisheries can have little validity if the Environmental Statement has not studied the impact of dredging on the meiofauna and phytoplankton [the foundations of the marine ecosystem and its structure] in the locality (ref. page 7 of EMU letter dated 29<sup>th</sup> July 2005). As a result, we maintain our assertion **that the**

**applicant's Environmental Statement does not record a management policy for the re-licensing of Area 401/2 based on the ecosystem approach (DEFRA 2002), and therefore re-licensing should not be permitted until the applicant has formulated a management policy to govern aggregate extraction in Area 401/2 based on the principles of the ecosystem approach.**

On a more positive note, we accept that the applicant and its consultant are now prepared to more accurately assess the importance of the *Sabellaria spinulosa* (Ross worm) communities in the locality and to take steps to protect them. However, the key question is whether these steps are adequate ?

In this context, it must first be observed that there has been some ambiguity as to whether the 1993/95 benthic survey or the 2004 benthic survey would serve as the baseline for the management of the site. The applicant's consultant has now acknowledged that the 1993/95 survey will serve as the baseline, contrary to the earlier proposals (ES, January 2005).

We welcome this change. However for this change to have meaning, it is essential that the data from the 1993/95 benthic survey is made publicly available to all consultees. **Accordingly, is our recommendation for the Government View procedure that the 1993/95 benthic survey should be re-published by the applicant and made available to all consultees prior to any determination on whether to re-licence Area 401/2.**

With regard to the *Sabellaria spinulosa* communities we note the following observations by the applicant's consultant in their letter and Technical Notes, dated 29<sup>th</sup> July 2005:

1. The full extent of the *Sabellaria spinulosa* communities is not yet known.
2. An additional survey should be designed and undertaken to establish the extent of these communities within Area 401/2, but the survey would be undertaken **after** the granting of new dredging permission. The design of the survey would be made in consultation with JNCC/EN and CEFAS, to whom the results of the survey would also be reported. The report would act a conservation plan in order to maintain these communities at a "favourable conservation status".
3. In order to protect known communities which have established "reef features" no dredging should occur within 1 km.
4. It is believed that *Sabellaria spinulosa* communities experience a natural cycle of accretion and degeneration, with the result that a community exists in a nascent form before its mature form as a "reef" and, similarly, the exact distribution and location of communities within an area (such as Area 401/2) will vary over time. Hence, the location of communities established in 1993/95 may be different from the location of communities in 2004 and, in turn, may be different again from the location of communities in 2013 [the proposed expiry date of the re-licensing period].
5. It is believed [based on benthic survey results for Area 401/2] that *Ophiura* (brittlestar) communities in Area 401/2 show a correlation in occurrence with *Sabellaria spinulosa* communities and that, in turn, other species such as starfish, urchins and crabs display a dependence for their presence on brittlestars.
6. It is believed that the *Ophiura* community in Area 401/2 does not form a biotope in its own right; rather, along with a wide range of other marine species, forms part of a biotope based on *Sabellaria spinulosa*.

This list of clarifications is most helpful.

However, it does raise a number of important questions, especially when trying to address the issues of whether there are any “compelling environmental disadvantages” which would disqualify the application to re-licence Area 401/2. These are:

1. Given that the full extent and location of *Sabellaria spinulosa* reefs (an Annex I habitat under Directive 92/43) is presently unknown, should the decision whether to re-licence Area 401/2 be suspended until the full mapping exercise is complete ? Otherwise is there not a real danger that existing reefs may be destroyed, simply because their existence is unknown ?
2. Given the belief that *Sabellaria spinulosa* communities undergo a natural cycle of accretion and degeneration, is there not a real danger that immature reefs (i.e. reefs that are in an earlier stage of formation prior to maturity) may be destroyed by dredging before they actually become “reefs” in accordance with the Annex I definition ? If this is so, is not the destruction of immature reefs contrary to the requirements of a management regime which is seeking to preserve this habitat at a “favourable conservation status” ?
3. Given that *Sabellaria spinulosa* communities are believed to be the key biotope in Area 401/2 (i.e. they support a specific ecological structure composed of a wide range of marine species bound together in a complex structure of dependency), should not the mapping of the full extent of *Sabellaria spinulosa* communities also include a study of the exact nature of this biotope within Area 401/2 and seek to characterise the full extent and nature of other marine species living within this biotope ? If this were to be done, would this not serve as an important first step towards obtaining the knowledge necessary to establish a management regime in Area 401/2 which is based on the ecosystem approach ?
4. If this extended study of the *Sabellaria spinulosa* biotope were to be undertaken (in accordance with the timescale and for the reasons given above), should not this study include an assessment of the meiofauna and phytoplankton present in the biotope given that such creatures are the foundation of the ecological structure of this biotope ? And, is not a proper study of the meiofauna and phytoplankton in this biotope essential to a clear understanding of the ecological structure (“habitats and species in an area that are required to support and sustain fish resources at a satisfactory level” ref. Technical Note 4, Commercial and Recreational Fisheries) necessary to support a sustainable fishery in Area 401/2 and the Great Yarmouth area in general ?

**Accordingly, it is our Recommendation for Government View:**

**There remains a clear concern that the applicant and its consultants are still failing to make a serious attempt to adopt and employ the ecosystem approach. As a consequence, the applicant’s Environmental Statement does not record a management policy for the re-licensing of Area 401/2 based on the ecosystem approach (DEFRA 2002). Therefore, re-licensing should not be permitted until such a management policy exists.**

**The 1993/95 benthic survey should be re-published by the applicant and made available to all consultees prior to any determination on whether to re-licence Area 401/2.**

**The full mapping of existing *Sabellaria spinulosa* communities and reefs should be completed prior to any determination on whether to re-licence Area 401/2.**

**Given the recognition that the Sabellaria spinulosa communities are the dominant biotope in Area 401/2, the mapping of these communities should be undertaken in a comprehensive manner in order to record the full nature of other marine species in this biotope, including meiofauna and phytoplankton, so that the ecological structure of this biotope may be determined in order to facilitate the development of an ecosystem management approach, both with regard to the biotope itself and the sustainable development of the fishery in the Great Yarmouth area.**

Conclusion.

Our recommendations for Government View have already been recorded above.

**However, we should like to record the following additional points for the attention of the Government View procedure:**

**If the applicant is correct in asserting that a Strategic Environmental Assessment has already been undertaken with respect to the East Coast (Great Yarmouth) block of dredging licences, then we believe that this Strategic Environmental Assessment should be made available to all consultees. At the present time, this Strategic Environmental Assessment has not informed this Environmental Statement for Area 401/2 and, as a result, we do not believe that comments can be accurately made by consultees under the Government View procedure until this information is available.**

**We believe that, at the present time, there exist potentially compelling environmental disadvantages with respect to the re-licensing of Area 401/2. These disadvantages take the form of serious unanswered questions regarding the applicant's Coastal Impact Study (see relevant foregoing section and Appendix I), and serious issues regarding the mapping and protection of the marine biological community within Area 401/2 and the surrounding area (see foregoing section on Biological and Ecological Impact).**

We also believe that it would be of great assistance if it could be clarified, either by the applicant or the licensing Government Department, whether a full regional Environmental Assessment of the Great Yarmouth block of dredging licences will be undertaken in 2013 and, if this is to be so, why this Regional Environmental Assessment cannot be commenced now.

Yours sincerely

S. D. Eades  
On behalf of MARINET,  
Marine Network of FOE Local Groups.

Enc. Appendix I

## **Appendix I.**

This Appendix is a re-statement of the Coastal Impact Study section originally submitted by MARINET on 24<sup>th</sup> March 2005 to the applicant's consultant (EMU Ltd) under the Government View procedure. It is reprinted here without amendment or alteration.

### Coastal Impact Study.

The coastline itself, from Winterton to Lowestoft, is made of soft materials (sand and clay cliffs, sand dunes) as opposed to hard materials (rock) and, in places, is bolstered by seawalls and groynes. As a result, it is inherently vulnerable to erosion.

The applicant does not believe that dredging in Area 401/2 has caused any damage to the adjacent coastline, nor that a continuation of dredging will cause any future damage.

It is to be noted that Area 401/2 is part of a large block of dredging sites, numbering around nineteen sites in total (sixteen according to the applicant) located between 6km to 26 km offshore. Reference: ES, Appendix D, Figure 1.

The inshore area between this block of dredging sites is characterised by a system of sandbanks and channels, the most notable sandbanks (moving from the coast eastwards) being Caister Sand, Scroby Sand linked to Corton Sand and Holm Sand, and Cross Sand; and, the most notable channels being Yarmouth Road (consisting of Caister Road linked to Corton Road), and Barley Picle. Reference: ES, Appendix D, Figure 1.

The maximum depth of the Yarmouth Road is 25 metres, and Barley Picle's maximum depth is 35 metres. The entrance to Yarmouth Road is via the southerly entrance (Corton Channel) whose maximum depth is 20 metres. Reference: Appendix D, Figures 8 and 9 (regarding depths) and R. Docrwa (personal communication to MARINET) regarding Corton Channel.

The applicant does not record how many of the sites within the offshore block are being actively dredged at the present time, or the scale of activity at these sites, both historically and at the present time. This is unfortunate because it is likely that these sites are collectively operating as one unit when it comes to assessing the impact on the coastline, and therefore this information is essential in order to understand the impact of Area 401/2.

The applicant's view that no damage is being caused to the coastline is based on the following arguments:

*“While some of the sediment at the seabed surface will undoubtedly be mobile within the proposed dredging area, all the evidence is that such transport will take place parallel, not perpendicular to the shoreline. In our opinion, therefore, sediments within the proposed dredging area are very unlikely to ‘interact’ with the sediments in the system of near shore sandbanks, and even less so with the coastline itself.”* Reference: ES, Appendix D, section 2.7.

and

*“In general, dredging can have two direct effects on the coastline. Firstly, the beaches can suffer from ‘beach draw-down’. However the western edge of the dredging area is over 8km from*

*the shore, where the water depths are greater than 20m and a system of sandbanks is located between the dredging area and the coastline. These sandbanks will prevent the direct interchange of material between the coast and the dredging area. Therefore there is no possibility of beach 'draw-down' taking place due to the existing or proposed dredging.*

*The second concern is that dredging may affect the supply of sediment to the shoreline from further offshore. From conclusions drawn from the evolution of the sandbank system in the review on Section 2, it is considered the major supply of sediment for the beaches in the region comes from cliff erosion.. It is highly improbable that any sediment transported through or from the dredging area will directly reach the coastline, and if any tendency for such sediment transport existed, it would be intercepted by the near shore bank system.” Reference: ES, Appendix D, section 6.7*

Also, with respect to wave conditions, the applicant relies on computer models and asserts that:

*“It can be safely concluded that the proposed continuation of the dredging in Area 401/2 will not affect wave conditions either along the shoreline, or even along the seaward edge of the sandbank system off this coastline.” Reference: ES, Appendix D, section 5.1.*

However the applicant’s portrait of no adverse impact from dredging on the adjacent coastline, either historically or in the future, does not concur with the reports submitted to MARINET by its members and other persons/organisations on the East Coast.

Therefore, the question arises whether the applicant’s portrait in the Environmental Statement and Appendix D is accurate.

A number of points appear to us to require consideration, and these have been largely ignored in the Environmental Statement and its related Coastal Impact Study. These are:

1. Prior to the commencement of dredging in the East Coast licences some forty or so years ago, the offshore sandbanks had a very different character to that which they possess today. This is important because these sandbanks are a primary means of “defence” for the coastline against erosion by waves and severe storms.

The Coastal Impact Assessment does not consider the historical nature of these sandbanks. This is an important deficiency, given that the applicant recognises the importance and role of these sandbanks in protecting the coastline from erosion:

*“The sandbanks, east of Great Yarmouth, reduce the severity of the wave climate experienced at the coastline by dissipating energy through frictional effects and breaking as waves pass over them. As any decrease in the height of these banks could increase the severity of the wave conditions further inshore it is necessary to assess the likely effects of dredging on these banks in the same rigorous manner as assessing the effects of dredging the coastline in other coastal impact studies. As described above, the wave analysis showed negligible impact from the proposed and existing dredging on waves arriving at the near shore banks.” Reference: ES, Appendix D, section 6.6.*

We will come to a consideration of the wave analysis in a moment, but let us first consider the historical character of these offshore sandbanks and the possibility that dredging may have altered

their character because, if their character has been so altered, this would be a significant material fact for the Government View procedure.

Firstly, it must be noted that the applicant's Coastal Impact Study provides no historical information as to the nature of these sandbanks i.e. their range, topography, composition and so forth, prior to the commencement of dredging (i.e. pre-1960s) and their subsequent evolution since the commencement of dredging. In our view, this is a serious deficiency of the Study. Not only is this essential information absent from the Study, but it also means that no assessment has been made of the cumulative effect of dredging in the East Coast block of licences upon the coastline during the last forty years.

Secondly, our own research (Percy Trett, naturalist, personal communication to MARINET) has revealed that one of these sandbanks, Scroby Sand, used to be permanently above sea level whereas today it is always below low tide level.

In our communication with Mr. Trett, we have learnt that Scroby Sand in 1947 used to measure three-quarters of a mile by one-quarter of a mile in extent, and that this extent is for sand above high water on a spring tide. The sandbank was shaped like a comma, composed of very fine sand with a clay ridge, supported marram dunes, and could be safely remained upon overnight by naturalists undertaking surveys of the seal and tern colonies which lived there. At low water on a neap tide, the sandbank would measure 7 miles by 1 mile.

Clearly, a sandbank of this character would provide important shielding to the adjacent coastline from waves and winter storms, especially when linked to the associated sandbanks also located offshore.

Mr. Trett, who as a naturalist was part of the regular survey of the seal and tern colonies, has noted that a storm surge in the winter of 1953 cut the island (Scroby Sand) in half, but that in the following years the size and extent of the sandbank regenerated.

Then again, according to Mr. Trett, a winter storm surge levelled the island (Scroby Sand) in 1963, but this time the expected regeneration (which had occurred historically following such surges) did not take place. In Mr. Trett's opinion, this was due to the commencement of offshore aggregate dredging in the licensed areas adjacent to both Scroby Sand and the other sandbanks. In short, this dredging appropriated the disturbed sand and thus denied the sand to the process involved in the natural regeneration of these sandbanks.

This record described here has not been recorded or assessed by the applicant. It is important to be clear on one point. Although this record has been provided to us in detail by one individual (and supported by the testimony of others), it is not anecdotal. It is a factual record which exists and can be substantiated by archived records.

It is therefore a serious deficiency of the applicant's Coastal Impact Study not to have considered this matter. It is serious because the erosion and loss of these sandbanks is a material factor in the protection of the adjacent coastline from erosion.

Therefore, it is an essential requirement of the Study to have determined whether the historical pattern of aggregate dredging has been a significant causal or contributory factor to the pattern of coastal erosion which is documented to have occurred offshore and on the adjacent coastline in the past forty years.

This specific analysis is wholly absent from the applicant's Coastal Impact Study.

2. The applicant's Coastal Impact Study asserts that wave conditions have not been affected by aggregate dredging activities, and that therefore neither the offshore sandbanks nor the coastline itself will have been adversely affected.

The information above on the failure of the offshore sand banks to regenerate casts doubt on this assertion.

The question must therefore be asked as to what is the factual basis for the applicant's assertion. In Appendix D, the applicant states the following with regard to the factual data for its wave model:

*“Within the area of interest, there were only two sources of instrumentally measured offshore wave data. The first was from the wave rider buoy 7km offshore from Great Yarmouth, the data from which for commercial reasons was not available. The other source of wave data is Smith's Knoll Light Vessel, some 35km offshore from Great Yarmouth, although no directional information had been collected at this site.”* Reference: ES, Appendix D, section C 3.1.

As a result, the applicant used the following wind data for its wave model:

*“The offshore wave conditions used as input to the wave transformation model are based on extremes derived from HINDWAVE predictions [the computer model] driven by 20 years of wind data measured at Gorleston 1970-1990.”* Reference: ES, Appendix D, section 3.3.

Thus, it is clear that offshore wave data were not used in this model, and that the data took the form of wind speeds for a land based station (Gorleston), and for a twenty year period which is almost fifteen years distant from the present (i.e. not contemporaneous).

In Appendix 1 to the Coastal Impact Study [Appendix D of the Environmental Statement] this matter of wind data in the calibration of the computer model is referred to:

*“Suitable wind data is available from coastal stations only, which may not be representative of conditions over the sea. A speed-up function is necessary, which may be dependent upon both speed and direction. Calibration of the model usually takes the form of adjustment of this factor. Its magnitude may be determined by a general examination of the anemograph site, or by comparison with the offshore wind frequencies, or by a comparison between predicted and measured wave heights, if available.”*

As has already been noted, a comparison with offshore wind frequencies and offshore wave heights was not available (Reference: ES, Appendix D, section C 3.1.). Therefore one must assume that the calibration of the computer model [HINDWAVE] for increased wind speed and variations of wind direction offshore ( i.e. in the area of the sandbanks) must have been accomplished by a general examination of the anemograph site [Gorleston].

However, no details of this “general examination of the anemograph site” are provided, and therefore the accuracy of the calibration of this computer model is undetermined.

Also, Appendix 1 [Appendix D] notes:

*“The model is dependent upon having a long sequence of high quality hourly wind velocities, which are assumed constant across the wave generation area. The calculations do not include an estimation of long period swell, which may render the model unsuitable for use in certain areas of application.”*

As has already been noted, the Gorleston wind data is fifteen years out of date. This does not exactly square with the requirement for “a long sequence of high quality hourly wind data velocities, which are assumed constant across the wave generation area.” Indeed, the applicant provides no detail as to the nature of the Gorleston wind data.

Further, as has been noted earlier, the offshore sandbanks are most vulnerable during winter storm surges. This is when wave heights and velocities are at their greatest. In the applicant’s computer model “calculations do not include an estimation of long period swell.” This suggests that the computer model is incapable of assessing those precise offshore wave conditions (winter surges) which are most likely lead to erosion of the offshore sandbanks. Hence, as a direct consequence, this suggests that the computer model is incapable of assessing whether aggregate dredging is intensifying those wave conditions; and, as a further consequence, whether waves of increased height and velocity are arriving at the beaches.

There is, therefore, a large area of uncertainty as to the accuracy of the applicant’s Coastal Impact Study and wave model.

What conclusions are therefore to be drawn from the foregoing analysis ?

The applicant asserts that sediment movements offshore are parallel, not perpendicular, to the coast and therefore there is no exchange of material between the dredging sites and the coast i.e. material is not supplied to the coast from offshore. Further, it is asserted that the pattern of waves, in height and velocity, arriving on the coast from offshore has not changed over time or due to offshore dredging. And, additionally, it is asserted that beach material (sand) arises along the coastline due to wave erosion of the sand cliffs and not from any other source.

Whilst the character of offshore sediment movement may be as the applicant describes, and whilst cliff erosion may be the primary source of sandy beach material along the coast, the applicant’s portrait of the dynamics of this system begins to appear deficient when other factors are taken into account.

These other factors are:

1. The historical nature of the offshore sandbanks and their function as a form of coastal defence. As we have seen, Scroby Sand was a significant factor in this regard, and this sandbank has altered significantly during the past forty years. This primary defence against onshore coastal erosion has been seriously weakened, and the applicant’s Coastal Impact Study has given no account of this change. Nor has the applicant’s Study attempted to assess whether dredging is a causal or contributory factor in this change. It has to be said that this is a major deficiency in the Study because it is clear that the change in the nature of Scroby Sand, and possibly the other adjacent sandbanks, appears to be a material factor in the protection of the coastline from erosion.

2. With the decline in the height and extent Scroby Sand, and possibly the other adjacent sandbanks, it is reasonable to suppose that the offshore wave pattern, both in terms of height and velocity, has altered. And, that such a change would impact on the coastline itself.

The analysis of the applicant's wave study reveals that offshore wave data did not inform their study. Data from the wave rider buoy 7km offshore from Great Yarmouth (i.e. in the vicinity of the offshore sandbanks) was not available for commercial reasons. We are surprised by this statement. The applicant does not state who owns this information, or why it was not commercially available. This is clearly crucial information for informing the wave study, and we believe the Government View procedure should give rigorous analysis to this point.

The wave model therefore relied on onshore wind speed data which, the applicant clearly indicates, needs to be very carefully calibrated if it is to accurately reflect offshore conditions. In fact, this onshore wind data is fifteen years out of date, and its calibration appears not to have been checked against the wind speeds recorded offshore at the Smith Knoll Light Vessel situated 35km offshore. Further, the calibrations in respect of wind direction and "long period swell" (surges under storm conditions) appear not to have been validated at all, both of which are identified as significant factors by the applicant in establishing the integrity of the wave model.

Therefore, the applicant's assertion that wave conditions (height and velocity) moving from offshore onto the coast have not changed is highly suspect and lacks validity.

In turn, given the serious flaws in this wave model, this means that the true impact of aggregate dredging on the nature of the offshore sandbanks and onshore coastal erosion has not been properly assessed. This is a very fundamental deficiency and, in our opinion, seriously undermines the integrity of the Coastal Impact Study. In short its analysis, and the assertions based on this analysis, lack validity.

This also means that sandy material, which currently supplies the beaches as a result of cliff erosion, will likely be "drawn-down" from the beaches during storms and lost from the natural process of onshore-offshore sediment movement which has traditionally regenerated the beaches during calmer periods. In turn, this would mean that the beaches would possess less sand and become stonier, their profile would steepen, and that cliff erosion would intensify. It is to be noted that precisely these phenomena have been reported to MARINET as occurring along this coastline by MARINET members and other persons/organisations.

Finally, it is to be noted that in Appendix C the applicant records:

*"The Dutch Government has undertaken a strategic environmental impact assessment which has established that extraction down to 2m is generally acceptable outside the 20m depth contour or 20km distant from the Dutch coast, whichever is closer. A further study has been commissioned to consider the potential environmental effects of larger scale production, with potential reserves of up to 400 million tonnes."* Reference: ES, Appendix C, section C.7

Given that the East Coast (Great Yarmouth) block of dredging sites is located between 6km and 26km offshore in water just below 20m in depth, and given that this block is engaged in large scale production (and has been for a number of years), it appears essential to MARINET that the UK Government acts, like the Dutch Government, to undertake a strategic environmental impact assessment (under EU Directive 2001/42) of the East Coast block of licensed dredging sites, and to do so before determining the decision on whether to licence Area 401/2

**Recommendations for Government View:**

**It is our view that Area 401/2 should not be relicensed until**

- (i) The applicant has undertaken a full assessment of the impact of dredging on the offshore sandbanks, and has properly assessed whether changes in the nature of these sandbanks is leading an alteration in the height and velocity of waves arriving on the coastline, and**
- (ii) The UK Government has applied the EU Strategic Environmental Assessment Directive (2001/42) to the East Coast (Great Yarmouth) block of licences.**