



BioAtlantis

Nature Working Naturally™

License Application for Sustainable hand-harvesting of *Ascophyllum nodosum* at Clew Bay (SAC Site Code 1482). In accordance with National Parks & Wildlife Service conservation objectives for marine and coastal habitats and species, and the EU Habitats Directive 92/43/EEC.

Reply to Submissions (Summary) *(ref: FS 6269)*

Prepared by: BioAtlantis Ltd.
Date of issue: 02/03/2015

BioAtlantis Ltd,
Clash Industrial Estate,
Tralee,
Co. Kerry.

Contents

SECTION 1: Cover letter.....	3
SECTION 2: Issues raised in submissions.....	7
SECTION 3: Response to submissions (Summary).....	9

SECTION 1: Cover letter

Dear Sir/Madam,

BioAtlantis has carefully read all the submissions made and is satisfied that it has addressed all the issues raised. Comprehensive responses to each are attached.

It could be said that the submissions fall into two broad groups, those of a technical, scientific or environmental nature and those related to the concerns of local harvesters and the issues that they perceive will impact them should a licence be granted. The latter group makes up a clear majority of submissions.

We are confident that we have addressed all of the technical, scientific and environmental issues in a comprehensive and robust manner.

With respect to the second group of submissions related to the concerns of local harvesters, our vision is very clear. If our licence application is successful our objective will be to see as little change as possible in terms of current harvesting activities in Clew Bay, save that the company will work to develop the sustainable seaweed harvesting business in Clew Bay to its full potential and allow all local harvesters increase their incomes if that is their wish.

BioAtlantis has no wish to jeopardise the livelihood of any individuals as a result of its licence application. In the event that we are successful in obtaining a licence for Clew Bay, it is not our intention to restrict existing harvesting practice. Traditional hand harvesters have taken care of the seaweed resource for generations and we want this to continue. That's why we are proposing a partnership with local harvesters.

Partnership approach as envisaged by BioAtlantis

Our vision is for a partnership arrangement with local harvesters which would see BioAtlantis working with them to maximise their returns from their harvesting activity. We believe we can work together to our mutual benefit.

- Harvesters will have the option of continuing to harvest as much seaweed as they did in the past from the same areas. However, areas that have been recently over-harvested may have to be allowed a period of fallowing to allow regrowth.
- Harvesters will have the added certainty of a guaranteed buyer for their crops.
- This two way commitment between harvester and buyer will provide a greater level of commercial certainty to both sides.
- BioAtlantis will make a commitment to pay a market leading price for seaweed. We are confident that our high value product range and premium customers will allow us to support a market leading price to seaweed harvesters.
- Collection Vessel: All harvesters, regardless of their working arrangements with BioAtlantis, will benefit from the introduction of a pick-up vessel in Clew Bay. This will pick up the seaweed from hand harvesters, thus relieving them of the difficult and time consuming task of transporting the seaweed ashore. This also has much less impact on the environment especially coastal habitats as it lessens the requirement for heavy machinery. It will also allow harvesters to cut smaller

quantities to fit a weather window as they will not be required to cut a full load. It will also facilitate immediate weighing, checking and payment systems.

- BioAtlantis can bring certain improvements to the harvesting process without in any way interfering with traditional hand harvesting methods. For example, the modern food industry requires increasingly exacting traceability standards and BioAtlantis will be able to assist in putting these in place. BioAtlantis is GMP+ accredited. This quality system puts traceability at its core therefore, BioAtlantis believes it is more than competent to help harvesters to put a system in place that meets the environmental requirements of the SAC.
- BioAtlantis will also help introduce operating practices which will document the care taken by harvesters to preserve the SAC to required environmental standards. This will involve our Resource Manager (who will operate the collection vessel) recording the amounts harvested each day and the areas set aside. The Resource Manager who will be from Clew Bay, will monitor the SAC area and plan in advance for sites which have sensitive harbour seal and bird life at certain seasons of the year.
- BioAtlantis are open to supplying other existing processors in Clew Bay with seaweed.
- Investment in Clew Bay: BioAtlantis will incur costs of **€500K+** as follows:
 - Licence application cost to date: **€100k**
 - Site-by-site resource measurement: **€50k**
 - A collection boat will be provided by BioAtlantis which will allow harvesters to focus on harvesting and avoid having to tow seaweed ashore. This will include a crane and a weighing system on the boat together with a traceability system so people can cut daily quantities, which will be collected daily, weighed and traced to the harvest site. Text message or email will be sent via smart phone to confirm payment and allow for quick processing of payment
Cost: €350k +
 - We will employ a local skipper as Resource Manager to operate the vessel. **Cost: €50k per annum.**

BioAtlantis will contact the local harvesting community in the coming days with a view to setting up meetings to establish what arrangements would suit individual harvesters best.

Combining science with tradition

We believe that the best way forward to ensuring the sustainability of hand harvesting is to combine the expertise of local hand harvesters built up over generations with the best that industry has to offer in terms of adding value to the crop. Other companies want to move towards modern methods, which may not be as environmentally friendly. BioAtlantis in contrast wants to ensure that the traditional method continues. BioAtlantis favours the traditional method with a sickle or knife at low tide and leaving 8-12 inches of material behind post-harvest. This provides harvesters with a full view of the cutting process and allows them to take care not to disturb the substrate and not harvest too low or damage the holdfast. Indeed, this traditional method forms the basis of our application.

Competition in the seaweed industry

Since its establishment, BioAtlantis has sourced its raw material requirement from Ireland's main seaweed harvesting company, Arramara Teo, a Connemara-based state owned seaweed processor. However, in May 2014 Arramara's main shareholder Udarás na Gaeltachta sold the business to the Canadian company, Acadian Seaplants.

As one of the Arramara's main customers, BioAtlantis has genuine concerns about the risk to its raw material supply posed by the sale to a competitor company. Consequently, in January 2014, BioAtlantis applied to the Department of the Environment, Heritage & Local Government for a licence to harvest seaweed in Clew Bay. BioAtlantis took out an advertorial in the Mayo News on 16th December 2014, to ensure everyone with an interest in our proposal would be aware of our application.

BioAtlantis believes that competition is the foundation for any healthy business sector. It is important for the future development of all stakeholders in the seaweed processing supply chain that no one company should have exclusive access to this valuable indigenous resource. If BioAtlantis is granted the licence for Clew Bay it will remove the risks currently associated with our raw material supply and secure our business for the future and guarantee the future of traditional hand harvesting by those who have been engaged in it for generations. More importantly, providing access to BioAtlantis for the small area of Clew Bay will maintain competition in the sector for the benefit of all concerned.

Irish jobs

BioAtlantis as a company is expanding rapidly, creating new jobs in Ireland, and exporting innovative Irish made products to more than 30 countries around the world. It plans to double in size in the next 2-5 years. The application for a harvesting licence at Clew Bay has been made in order to safeguard the company's supply of seaweed to ensure that it can realise its full job creation and economic potential in the coming years. The company is well regarded by Enterprise Ireland and this is reflected in its continued support for its research efforts and job expansion.

Adding value

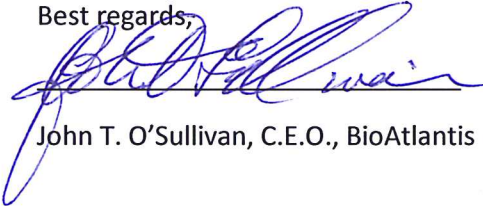
BioAtlantis is not merely a seaweed trading company nor is it just focussed on primary processing of the material. The company is involved in science-based development of a range of innovative agriculture products which are derived from seaweed. We have partnered with a wide array of research institutions over the last ten years and are currently engaged in research partnerships with over 26 research institutes and universities worldwide, with three patents on molecules extracted from seaweed. In this context the company is naturally anxious to secure its supply of high quality natural seaweed into the future.

Regulating the sector

Ultimately our preferred option would be for some sensible regulatory regime to be put in place by the Government which would protect the interests of local harvesters and commercial concerns like BioAtlantis. There is room for all of us in the sector but it requires some form of regulatory regime that supports competition and multiple players in the sector, unfortunately such a structure does not currently exist.

We would like to take this opportunity to thank all those who took time to write their submissions during public consultation. We have worked to take all views on board. In this document, BioAtlantis provide (a) a response to each issue raised during public consultation and (b) reply letters to each submission letter/email received. In addition to those who will make their decision on this application, we also encourage those who wrote their submissions during public consultation to take time to read the letters which we have written in reply to them. They should also feel free to contact us directly.

Best regards,



John T. O'Sullivan, C.E.O., BioAtlantis Ltd.

Date: 2nd March 2015

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SECTION 2: Issues raised in submissions

Each submission received by the Department during public consultation has been assigned codes in accordance with the order in which they were received (i.e. submission no.1, no.2, etc). The number associated with each submission is marked on the top right hand corner of each submission document. BioAtlantis has issued a reply to each of the individual submissions received (See Appendix 1). For clarity, the reply to each submission is indicated using codes. For example, reply number 'R1' is written in response to submission no. 1, etc. Each reply written by BioAtlantis is provided in Appendix 1 to this document. A brief summary of the issues which arose during public consultation are provided in the table below, in order of their frequency in which they occurred. For responses to each issue, please see Section 3.

Issue raised	% of total submissions (approx.)	Response written by BioAtlantis
Traditional harvesting, local employment	81%	✓Yes (See Appendix I)
Exclusivity & free market	53%	✓Yes (See Appendix I)
Income, livelihood, financial aspects	40%	✓Yes (See Appendix I)
Consultation	39%	✓Yes (See Appendix I)
Sustainable methods used by harvesters	19%	✓Yes (See Appendix I)
Monopoly	15%	✓Yes (See Appendix I)
Track record of BioAtlantis, resource science & environmental responsibility	13%	✓Yes (See Appendix I)
Impact on SAC	12%	✓Yes (See Appendix I)
Measurement of the resource	11%	✓Yes (See Appendix I)
Other companies	11%	✓Yes (See Appendix I)
Recreation & sport	9%	✓Yes (See Appendix I)
"Sell off" of the licence by the company	9%	✓Yes (See Appendix I)
Periwinkle collection	8%	✓Yes (See Appendix I)
Periwinkle numbers	8%	✓Yes (See Appendix I)
Aquaculture	7%	✓Yes (See Appendix I)
Tourism	7%	✓Yes (See Appendix I)
Collection of seaweed or shellfish, etc,	7%	✓Yes (See Appendix I)
Clew Bay Oyster Fishery Order & Co-op	4%	✓Yes (See Appendix I)
Pollution	4%	✓Yes (See Appendix I)
Infrastructure and congestion (e.g. piers)	4%	✓Yes (See Appendix I)
Fish & fishing	4%	✓Yes (See Appendix I)
Link between BioAtlantis and Clew Bay	3%	✓Yes (See Appendix I)
Maps showing aquaculture sites	3%	✓Yes (See Appendix I)
Shoreline, erosion, etc	3%	✓Yes (See Appendix I)
Crustaceans	3%	✓Yes (See Appendix I)
Hauliers & other service providers	1%	✓Yes (See Appendix I)
Ability to use the Resource & cited quantities	1%	✓Yes (See Appendix I)
Need for the resource	1%	✓Yes (See Appendix I)
Ability to process the resource	1%	✓Yes (See Appendix I)
Ability to add value	1%	✓Yes (See Appendix I)

Ability to establish in house research	1%	✓Yes (See Appendix I)
Proof of concept	1%	✓Yes (See Appendix I)
Costs incurred by BioAtlantis	1%	✓Yes (See Appendix I)
Activities at School house bay	1%	✓Yes (See Appendix I)
Noise	1%	✓Yes (See Appendix I)
Amenity at Rosmindle pool area	1%	✓Yes (See Appendix I)
Draft fishing	1%	✓Yes (See Appendix I)
Food chains	1%	✓Yes (See Appendix I)
Birds	1%	✓Yes (See Appendix I)
Flood defences	1%	✓Yes (See Appendix I)
Controversy over sale of Arramara to Acadian	1%	✓Yes (See Appendix I)
Scale of harvesting by BioAtlantis	1%	✓Yes (See Appendix I)
Impact on mussel farms	1%	✓Yes (See Appendix I)
Foreshore licences	1%	✓Yes (See Appendix I)
Energy consumption	1%	✓Yes (See Appendix I)
Duration of licence and monitoring	1%	✓Yes (See Appendix I)
Folio rights	1%	✓Yes (See Appendix I)
Otter <i>Lutra Lutra</i>	1%	✓Yes (See Appendix I)
Limitations of Kelly et al., 2001	1%	✓Yes (See Appendix I)

SECTION 3: Response to submissions (Summary)

This Section provides a brief summary of the responses by BioAtlantis to the issues raised. The issues raised are indicated in the second column from the left, ordered in accordance with the frequency in which these issues occurred. In addition to the summary response by BioAtlantis as provided in the third column, more detailed responses are also provided in the individual reply letters written by BioAtlantis (See Appendix 1). These reply letters address each person who took time out to write their submission. We encourage all those who wrote their submissions to read the reply letters written especially for them. For each issue that is listed below, the submission Ref. number refers to the individual submission letters/emails received during public consultation, which raised that issue. The figures for “% of total” submissions indicates the % of the total submissions which raised a particular issue.

No.	Issue raised	Summary of response	Submissions		Reply to specific submission (Y/N) (see Appendix I)
			Ref No.	% of total	
1	Traditional harvesting, local employment	BioAtlantis, as an indigenous Irish company, will work in partnership with local, traditional hand harvesters, landowners and those with fishing interests in the Clew Bay area. Statements to this effect were mentioned in the Mayo News advertorial on December 16 th 2014. As BioAtlantis has a requirement for seaweed, we will be able to offer contracts to local harvesters to fulfil that supply. This represents a more permanent relationship than ad hoc purchasing of seaweed.	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 68, 70, 71, 72, 74	81%	Yes ✓ See Appendix 1
2	Exclusivity & free market	BioAtlantis will make a commitment to pay a market leading price for seaweed. We are confident that our high value product range and premium customers will allow us to do so.	1, 2, 11, 14, 15, 16, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 33, 34, 37, 38, 39, 40, 41, 42, 43, 45, 48, 49, 50, 50, 51, 52, 54, 55, 56, 57, 61, 63, 64, 68	53%	Yes ✓ See Appendix 1
3	Income, livelihood, financial aspects	As stated above, BioAtlantis will make a commitment to pay a market leading price for seaweed. BioAtlantis will also operate a collection vessel in the Clew Bay area. This will be under the control of the Resource Manager (a Clew Bay local). The advantage of this is that it will save the harvesters time and money, as they otherwise have to tow seaweed ashore. It will also allow harvesters to cut smaller amounts as the seaweed will be collected daily, thus avoiding the danger of losing their harvest due to a change in weather conditions. It also allows for instant weighing and fast payment.	1, 11, 13, 15, 16, 17, 19, 20, 22, 24, 26, 28, 32, 33, 34, 35, 38, 39, 50, 54, 55, 57, 59, 61, 62, 64, 66, 70, 71, 74	40%	Yes ✓ See Appendix 1
4	Consultation	BioAtlantis met with ~10 local harvesters to date. We wish to meet more to explain what we propose. This is stated in our application.	2, 5, 6, 11, 14, 15, 23, 25, 27, 28, 30, 31, 34, 35, 37, 40, 41, 42, 43, 46, 48, 49, 50, 51, 52, 55, 56, 57, 61	38.7%	Yes ✓ See Appendix 1
5	Sustainable methods used by harvesters	BioAtlantis want to maintain the traditional methods used by harvesters for generations. This is outlined in our application.	1, 15, 16, 20, 21, 22, 24, 26, 33, 35, 38, 39, 50, 74	18.7%	Yes ✓ See Appendix 1
6	Monopoly	We believe that competition is the foundation for any healthy business sector. It is important for the future development of all stakeholders in the seaweed processing supply chain that no one company should have exclusive access to this valuable	12, 15, 16, 22, 26, 50, 62, 63, 64, 66, 72	14.7%	Yes ✓ See Appendix 1

		indigenous resource. Providing access to BioAtlantis for the small area of Clew Bay will maintain competition in the sector for the benefit of all concerned.			
7	Track record of BioAtlantis, resource science & environmental responsibility	<p>BioAtlantis is registered by the Department of Agriculture in Ireland for the manufacture and sale of feed material. BioAtlantis are accredited as having 'Good Manufacturing Practices', by GMP+ International B.V., one of the highest feed safety standards in the world, requiring high standards in traceability, quality and safety. A highly qualified professional team is in place in BioAtlantis covering science and engineering fields, including 7 PhDs. BioAtlantis have three patents filed on benefits arising from seaweed extracts and have over 20 peer reviewed publications on the same subject. The Clew Bay project will be resourced properly and specialized personnel will be hired as required.</p> <p>BioAtlantis have developed a sustainable system which is based on best scientific knowledge and provides a range of mitigation measures which will prevent impacts on the resource and protected marine and coastal habitats and species. This sustainable management system includes monitoring the resource and biotope over a long period of time and robust systems to ensure full traceability of all harvest activities and their sustainability.</p>	16, 22, 26, 33, 34, 36, 39, 46, 47, 50,	13.3%	Yes ✓ See Appendix 1
8	Impact on SAC	BioAtlantis assessed the requirements by NPWS and the EU to ensure that conservation objectives for marine and coastal habitats and species in Clew Bay are not impacted by hand harvesting. A range of mitigation measures have been developed along with a harvesting Code of Practice which is informed by best scientific knowledge. A Natura Impact Statement has also been submitted.	6, 13, 24, 28, 32, 53, 58, 60, 70	12%	Yes ✓ See Appendix 1
9	Measurement of the resource	A pilot study was performed as a preliminary test of methods, feasibility, time, experimental design and <i>A. nodosum</i> variability. This involved on-site measures, use of data from Hession et al., 1998, and aerial photographs and satellite images. With the pilot study complete, analysis will be up-scaled to involve direct assessments to validate figures. This is stated in Appendix 4 in the section "Securing the Code of Practice during the operation phase" (pg.3 of Appendix 4). Replicate numbers will be sufficient to reflect variation of <i>A. nodosum</i> growth parameters pertinent to robust experimental design.	19, 36, 45, 46, 63, 64, 67, 75	10.7%	Yes ✓ See Appendix 1
10	Other companies	BioAtlantis is open to supplying other companies in Clew Bay with harvested seaweed. On page 121 of our application we state that any commercial user having requirements of >0.5 tonnes per annum (e.g. hotels, health Spas), will be approached by BioAtlantis to discuss their requirements. However, we are open to supplying other companies in Mayo with larger quantities if they desire.	1, 20, 36, 47, 66, 71, 74, 75	10.7	Yes ✓ See Appendix 1
11	Recreation &	Appendix 7 & section 3.6.2 of the main application document	4, 6, 7, 8, 13, 28, 32	9.3%	Yes ✓

	sport	details mitigation measures which prevent potential in-combination effects between harvesting and recreational and tourist-related activities. This includes seasonal avoidance of Collanmore, Westport harbour and Roman Island. The Code of Practice (Appendix 4) explains to harvesters the importance of preventing interactions with tourism & recreation. This will be adapted as required into the future, as stated in our application.			See Appendix 1
12	"Sell off" of the licence by the company	BioAtlantis will not sell a harvesting licence as an asset. We are building a long term company and aim to be the global brand leader in seaweed-based biostimulant and nutraceutical technologies. We have three patents filed and are 100% committed to Ireland and Clew Bay.	16, 20, 22, 26, 35, 38, 50	9.3%	Yes ✓ See Appendix 1
13	Periwinkle collection	This licence will not stop people picking periwinkles and other shellfish.	4, 6, 7, 8, 13, 32	8%	Yes ✓ See Appendix 1
14	Periwinkle numbers	Impacts on periwinkles and shellfish habitats will be minimised, as sustainable traditional techniques will be employed. This will include mitigation measures outlined on page 124 and 125 of the application and included in the Code of Practice (Appendix 4): <ul style="list-style-type: none"> • Harvesters will leave sufficient <i>A. nodosum</i> material behind • Harvesting will at low tide when periwinkles are generally less active and dormant or resting at the base of the <i>A. nodosum</i> canopy • Harvesters will be made aware of periwinkle reproductive requirements • 'By-catch' will be identified and returned to the water. 	4, 6, 7, 8, 13, 32	8%	Yes ✓ See Appendix 1
15	Aquaculture	Impacts on aquaculture are unlikely. Aquaculture sites in Clew Bay were identified in our application, based on existing and planned operations data from the Marine Institute (2014). Map BioA_10_14_001.8 in Appendix 2 provides these details. According to the Marine Institute: <i>"The likely overlap between these activities [harvest of seaweed on intertidal reef communities] and intertidal shellfish culture is considered small as the (reef) habitat is not considered suitable for shellfish culture".</i> Potential in combination impacts between harvesting and aquaculture which could impact on SAC conservation objectives were mitigated against, included in the Code of Practice (Appendix 4) and summarised as follows: <ul style="list-style-type: none"> • Code of practice for seasonal avoidance of sensitive harbour seal sites must be adhered to for all haul out sites. • Code of practice for environmentally safe navigation must be followed to ensure no in combination effects which would damage mudflats and sandflats. 	6, 11, 35, 44, 57	6.7%	Yes ✓ See Appendix 1

No.	Issue raised	Summary response	Submission		Reply to specific submission (Y/N) (see Appendix I)
			Ref. No.	% of total	
16	Tourism	<p>Impacts on tourism or interactions therein have been assessed in detail in Appendix 7 to this application. Page 14 and 18 of Appendix 4 details the Code of Practice for ensuring interactions are avoided or minimised. In-combination effects and interactions with existing and planned tourism-related operations/activities, were also assessed in Appendix 7, and described in Section 3.6 of the main application document. Potential impacts on SAC conservation objectives were mitigated against, and summarised as follows:</p> <p>Current operations:</p> <ul style="list-style-type: none"> • Risk 1 (Annex II species & birdlife): <ul style="list-style-type: none"> ➢ Mitigation: harvest will not take place at harbour seal & bird sites at sensitive times of the year, thus preventing any in combination effects from occurring. • Risk 2 (Annex I habitats and species): <p>Mitigation: harvesters will not work within 50m of bases where equipment or vessels are manually introduced in the water. This ensures that exacerbation of anthropogenic disturbance does not occur.</p> • Risk 3 (Collanmore island): <ul style="list-style-type: none"> ➢ Mitigation: Harvest will only occur on Collanmore between Sept-April. This will prevents exacerbation of anthropogenic disturbance which may occur during peak tourist season. <p>Planned operations:</p> <ul style="list-style-type: none"> • Risk 1: Mayo County Council targets Roman Island for development of marine-based activities and tourism (ref: Mayo County Council 2010), raising the potential for interactions. • Risk 1: Funding granted in Mayo County Council 2014 Budget for new marine tourism/leisure infrastructure at Westport Harbour (ref: Hynes P, 2014), thus raising the potential for interactions. • Mitigation measures: <ul style="list-style-type: none"> - Harvesters will avoid Roman Is. & Westport harbour at peak tourist season (May-August). - Harvesters will not work within 50m of bases where equipment or vessels are manually introduced in the water. 	6, 7, 13, 28, 32	6.7%	Yes ✓ See Appendix 1

No.	Issue raised	Summary response	Submission		Reply to specific submission (Y/N) (see Appendix I)
			Ref. No.	% of total	
17	Collection of seaweed or shellfish, etc,	This licence will not stop people collecting shellfish. Seaweed harvesting for personal use (<0.5tonnes) will not be affected (as stated in the application).	7, 13, 32, 38, 75	6.7%	Yes ✓ See Appendix 1
18	Clew Bay Oyster Fishery Order & Co-op	See point 15 above.	6, 32, 45	4%	Yes ✓ See Appendix 1
19	Pollution	There is a very low risk that pollution will occur due to hand harvesting. On page 77 of our application we state: <i>"It is highly improbable that a chemical hazard will occur given that no chemicals will be carried on board the boat, except for small quantities of standard cleaning material and fuel oil. Fuel oil is unlikely to leak as boat engines will be regularly maintained"</i> .	4, 6, 32	4%	Yes ✓ See Appendix 1
20	Infrastructure and congestion (e.g. piers)	Harvesting will be undertaken by local hand harvesters. BioAtlantis will introduce just one collection vessel which will be used to pick up the seaweed from the harvesters, thus preventing a significant increase in traffic or usage of piers.	6, 28, 32	4%	Yes ✓ See Appendix 1
21	Fish & fishing	Hand harvesting will be undertaken by local hand harvesters at low tide, at sustainable levels in order to ensure maintenance of <i>A. nodosum</i> canopies and maintenance of the overall ecosystem. The Burrishoole Catchment will be excluded from harvest activities as indicated on map BioA_10-14-001.1 (Appendix 2 of our application). Angler's space will be respected at all times (see pg. 18 of Appendix 4)	13, 28, 66	4%	Yes ✓ See Appendix 1
22	Link between BioAtlantis and Clew Bay	Many of the existing harvesters in Clew Bay supplied a company in Kerry in the past. They had a very positive relationship with the company with whom the C.E.O. of BioAtlantis was previously involved.	1, 5	2.7%	Yes ✓ See Appendix 1
23	Maps showing aquaculture sites	Map number BioA_10_14_001.8 in Appendix 2 was revised and constructed based on recent data from the Marine Institute report (2014). The updated version was provided as part of our revised application, and in advance of entry into public consultation. While a number of applications were not included in the map in the north of the complex, BioAtlantis is aware of these applications and mitigation measures are in place in our application to ensure no impact on protected species and habitats in the SAC, particularly with respect to protected mammalian and avian species.	6, 44	2.7%	Yes ✓ See Appendix 1
24	Shoreline, erosion, etc	There will be no impact on the foreshore that would give rise to denudation or erosion. Harvesting will take place in a sustainable manner using sustainable techniques. Mitigation measures are in place to ensure that overharvesting will not occur. The method is outlined in Appendix 4 to our application.	28, 32	2.7%	Yes ✓ See Appendix 1
25	Crustaceans	Hand harvesting will take place at a sustainable level to ensure that sufficient canopy coverage and habitat for crustaceans is maintained. Mitigation measures, monitoring and traceability systems have been	7, 13	2.7%	Yes ✓ See Appendix 1

		<p>developed to ensure that these standards are adhered to (see Appendix 4). Specific mitigation measures also deal with potential by-catch such as crustaceans. On page 10 of our Code of Practice we state:</p> <ul style="list-style-type: none"> Seaweed must be harvested in nets with mesh space large enough to allow for Amphipods, isopods or other by-catch to escape. Typically, 2 hours will be available for animals to migrate out of the nets before transfer to the collection vessel. Inadvertent co-removal of periwinkles, amphipods, isopods or other <i>Animalia</i> identified on the collection vessel must be collected and returned to the water. 			
26	Hauliers & other service providers	BioAtlantis will use hauliers and service providers to transport the seaweed and provide other services.	47	1.3%	Yes ✓ See Appendix 1
27	Ability to use the Resource & cited quantities	In January 2015, BioAtlantis expanded into a larger facility in order to utilize increased volumes of <i>A. nodosum</i> raw material. We also plan to expand into different markets based on proven, patented results. Thus, we do have a requirement for larger quantities of seaweed.	47	1.3%	Yes ✓ See Appendix 1
28	Need for the resource	BioAtlantis have grown at an average rate of 45% per annum since 2007 and sell value added products in over 30 countries worldwide. BioAtlantis will double in size and increase employment from 25 to 50 over the next 2-5 years, and will also provide sustainable long term employment to existing traditional local hand harvesters in Clew Bay. Our recent expansion into a new facility will allow BioAtlantis to expand our product range and move into different markets with new products.	47	1.3%	Yes ✓ See Appendix 1
29	Ability to process the resource	BioAtlantis have fully automated facilities for extracting and isolating molecules from seaweed. Our move to a larger facility in January 2015 which will cater for increased processing and expansion of our processing technologies.	47	1.3%	Yes ✓ See Appendix 1
30	Ability to add value	BioAtlantis is one of the few companies in Ireland who add value to seaweed. The company have three patents filed on benefits arising from seaweed extracts and have over 20 peer reviewed publications on the same subject. BioAtlantis are currently collaborating with >26 universities and research institutes worldwide. BioAtlantis will launch a new product range for pig and poultry in 2015.	47	1.3%	Yes ✓ See Appendix 1
31	Ability to establish in house research	<p>BioAtlantis have an established R&D department with a collective expertise across the natural sciences, including molecular genetics, chemistry, innate immunity, microbiology, monogastric health and engineering. Important aspects to research at BioAtlantis include:</p> <ul style="list-style-type: none"> ➤ Laboratory facilities: BioAtlantis have established laboratories and plant growth facilities at our headquarters in Tralee, which caters for our multidisciplinary team of scientists. ➤ Scientific Leadership: BioAtlantis are scientific leaders in their field and coordinators of an EU Framework 7 project (see www.thriverite.eu) and participants in two other research consortia (www.co-free.eu and www.biofector.info). ➤ Monogastric and human health: BioAtlantis have funded 5 PhDs 	47	1.3%	Yes ✓ See Appendix 1

		<p>and 4 MSc. students in partnership with Professor John O'Doherty, University College Dublin (UCD). This has resulted in two patents and over 20 peer reviewed science papers.</p> <ul style="list-style-type: none"> ➤ Crop science: BioAtlantis have funded MSc. students in collaboration with Enterprise Ireland and University College Cork (UCC) and have collaborated for over 8 years with the Agri-Food and Biosciences Institute (AFBI, Northern Ireland) in the area of crop production and plant health. A patent from this work has also been filed. ➤ Collaborations: BioAtlantis are currently working in collaboration with over 26 universities worldwide. 			
32	Proof of concept	<p>BioAtlantis have created a Code of Practice for sustainable hand harvesting in Clew Bay (Appendix 4 of our application). These standards require full traceability and monitoring of activities, along with assessments of compliance with the Code of Practice and mitigation measures. This will be critical in ensuring the protection of marine and coastal habitats and species, in accordance with EU Law and NPWS conservation objectives for the SAC.</p>	47	1.3%	Yes ✓ See Appendix 1
33	Costs incurred by BioAtlantis	<p>Investment in Clew Bay: BioAtlantis will incur costs of €500k+ as follows:</p> <ul style="list-style-type: none"> ➤ Licence application cost to date: €100k ➤ Site-by-site resource measurement: €50k ➤ A collection boat will be provided by BioAtlantis which will allow harvesters to focus on harvesting and avoid having to tow seaweed ashore. This will include a crane and a weighing system on the boat together with a traceability system so people can cut daily quantities, which will be collected daily, weighed and traced to the harvest site. Text message or email will be sent via smart phone to confirm payment and allow for quick processing of payment Cost: €350k + ➤ We will employ a local skipper as Resource Manager to operate the vessel. Cost: €50k per annum. 	1	1.3%	Yes ✓ See Appendix 1
34	Activities at School house bay	<p>In our application, we have considered a variety of sailing activities, including dinghy sailing and keel boat sailing in Clew Bay and areas in the vicinity School House Bay (pages 16, 17 & 18 of Appendix 7 to our application) and have mitigated accordingly from an environmental perspective, including:</p> <ol style="list-style-type: none"> Harvest will only occur on Collanmore between Sept-April. This prevents any in combination effects at peak tourist season. Hand harvesters will not work within 50m of bases where equipment or vessels are manually introduced in the water. This ensures that no in combination effects occur. <p>Given the comments from submission No. 4, BioAtlantis will ensure:</p> <ul style="list-style-type: none"> • Harvest will only occur at Schoolhouse Bay (just east of Collanmore) between Sept-April, thus preventing in-combination effects which 	4	1.3%	Yes ✓ See Appendix 1

		<p>could arise at busy times between May and August.</p> <ul style="list-style-type: none"> • Harvesters and operators of boats will be made aware of their requirements to: <ul style="list-style-type: none"> ➢ Keep well clear of boats during racing, etc. ➢ Observe "power gives way to sail" conventions when appropriate. 			
35	Noise	Harvested seaweed will be collected by a single collection vessel in Clew Bay and brought ashore at existing piers.	4	1.3%	Yes ✓ See Appendix 1
36	Amenity at Rosmindle pool area	Seaweed harvesting will be sustainable and will not negatively affect Rosmindle pool. Seaweed will not be collected by trucks at this site.	4	1.3%	Yes ✓ See Appendix 1
37	Draft fishing	Our application will not affect the rights of salmon draft licence holders to cut the seaweed in the adjacent areas to allow for hauling during the fishing season. In our application, we state that low-scale harvesting for personal use (<0.5 tonnes) will not be affected by our application. Utilization of local knowledge is considered on page 33 of our application.	5	1.3%	Yes ✓ See Appendix 1
38	Food chains	Seaweed, limpets and crab food chains will not be significantly affected. Limpets will be protected as the traditional method for hand harvesting will be minimally invasive and is designed to be sustainable (pg. 97 of our application). Animalia by-catch on the collection vessel supplied must be returned to the water (pg. 99 of our application).	7	1.3%	Yes ✓ See Appendix 1
39	Birds	BioAtlantis have liaised with Birdwatch Ireland and NPWS to determine the sites most important to these species. Mitigation measures are in place to ensure that harvest activities do not occur during sensitive times of year at sites that are important during breeding and wintering periods (see Appendix 4 to our application).	7	1.3%	Yes ✓ See Appendix 1
40	Flood defences	In our application, we determined that it is unlikely that hand harvesting will impact on natural flood defences such as Salt marshes. <i>A. nodosum</i> does not grow in large quantities in salt marsh areas and therefore will not be targeted for harvest activities. A mitigation measure is also in place to ensure that <i>A. nodosum</i> , should it be present, will not be harvested at the fringes of salt marshes (see page 118 of our application). Mitigation measures are also in place to prevent an impact on other coastal habitats. BioAtlantis also assessed documents which relate to Mayo County Council's Strategic Flood Risk Assessment (2014). We identified no risk of in-combination effects between harvesting and these objectives (see pg 34 of Appendix 7 to our application).	12	1.3%	Yes ✓ See Appendix 1
41	Controversy over sale of Arramara to Acadian	We agree with comments regarding the sale of Arramara. Údarás na Gaeltachta sold Arramara to Acadian Seaplants who are the biggest global competitor to Irish companies such as BioAtlantis. Acadian under the guise of Arramara have plans to apply for a licence to harvest seaweed from Loop head, Co. Clare to Belmullet, Co. Mayo. BioAtlantis believe that this will weaken competition in the sector. If Acadian is in control of the entire area from Clare to North Mayo, then they can pick	28	1.3%	Yes ✓ See Appendix 1

		and choose harvesters and determine the conditions of supply. It would also place BioAtlantis and other Irish processors in an unacceptable situation where they will be potentially dependent on their major competitor, Acadian, for their supply.			
42	Scale of harvesting by BioAtlantis	Harvesting will be sustainable. We have applied for a maximum sustainable harvestable of 12,900 wet tonnes per annum which is slightly less than those levels determined by Hession et al., 1998. Each site will be assessed prior to harvesting taking place, as described in our application. This will occur at the beginning of the operational phase. Mitigation measures have been designed to ensure that overharvesting does not occur. Moreover, harvesting will be undertaken by local harvesters with experience in how to cut seaweed sustainably.	32	1.3%	Yes ✓ See Appendix 1
43	Impact on mussel farms	BioAtlantis will be providing one collection vessel in Clew Bay. This will not interfere with floating structures in Newport Bay or other areas. Local harvesters from Clew Bay also have an in depth knowledge of the distribution of floating structures.	46	1.3%	Yes ✓ See Appendix 1
44	Foreshore licences	Individuals with a licence for their own foreshore will be unaffected by this application.	49	1.3%	Yes ✓ See Appendix 1
45	Energy consumption	BioAtlantis will transport harvested seaweed to our facilities in Tralee where we manufacture value-added products. The cost of transporting seaweed equates to the cost of drying. Also, since drying can potentially lead to losses in efficacy of seaweed extracts, transporting fresh seaweed is preferably. BioAtlantis will also provide a single collection vessel to pick up harvested seaweed in Clew Bay. This will minimise energy costs and time spent by harvesters will be reduced as they will not have to tow harvested seaweed ashore.	66	1.3%	Yes ✓ See Appendix 1
46	Duration of licence and monitoring	BioAtlantis is open to being audited on an annual basis as a requirement of the licence. BioAtlantis propose a licensing system over a ten year period. As the system will have full traceability, performance can be assessed by regulatory authorities throughout the duration of the licence. This will allow for investment in capital expenditure and research. A three year licence would only allow for a continuance of drying seaweed and export of a commodity product, which is not in the best interest of the harvesters or the seaweed industry in Ireland.	66	1.3%	Yes ✓ See Appendix 1
47	Folio rights	Those with folio rights will not be affected by our application	70	1.3%	Yes ✓ See Appendix 1

No.	Issue raised	Summary response	Submissions		Reply to specific submission (Y/N) (see Appendix I)
			Ref. No.	% of total	
48	Otter <i>Lutra Lutra</i>	<p><i>This is a brief description of the response we issued in reply to the submission by Shay Fennelly, an employee of Aquafact Consultants, the company who is working on Acadian/Arramara's application to harvest from Clare to North Mayo. For more details, please see consult our reply letter to Mr. Fennelly (see Ref: 72).</i></p> <p>Data used in assessment Data published by NPWS (2011) which describes the range and usage requirements of Otter <i>Lutra Lutra</i> in their natural habitats in Clew Bay, was used in our assessment. This data provided a strong framework in which to address risks to otters and mitigate where necessary. As otters occupy both freshwater aquatic, marine aquatic and associated terrestrial habitats, they require unrestricted access to sites and islands throughout Clew Bay. They also require unrestricted access to an adequate food supply. According to NPWS (2011), the conservation objective for otters are to restore the favourable conservation conditions defined by a number of attributes. Each attribute was considered. A range of mitigation measures are in place to ensure no impacts on Otter <i>Lutra Lutra</i>.</p> <p>General mitigation measures:</p> <ul style="list-style-type: none"> • Always follow pre-planned harvest schedules provided by BioAtlantis. This ensures that harvesters arrive to the foreshore by boat or by via existing routes. Moreover, routes used will not increase significantly beyond current levels already used by harvesters in Clew Bay. As there will be a collection vessel provided by BioAtlantis, this will minimise the length of time that harvesters boats are in the water. This reduces the risk of harvesters interacting with otters. • Harvest areas are defined by BioAtlantis. This ensures that harvesters do not enter into areas which are deemed highly sensitive in terms of food supply (e.g. Burrishoole). • All freshwater areas are prohibited from any harvest-related activities. This prevents any interactions in freshwater habitats. • To minimise disturbance or interaction with otters, harvesters will ensure: <ul style="list-style-type: none"> ➢ All activities are maintained within the intertidal <i>Ascophyllum nodosum</i> zone. This ensures that harvest activity takes place in the intertidal zone and will not affect Otter <i>Lutra Lutra</i> holts beyond the intertidal zone. ➢ Harvesters must not interfere with Otter <i>Lutra Lutra</i> couching sites, holts or access paths/routes. Harvesters will be made aware that these areas must not be interfered with or blocked in any way. This will be part of their training. 	72	1.3%	Yes ✓ See Appendix 1

		<p>Site specific measures</p> <ul style="list-style-type: none"> • The freshwater lagoon on east side of InishGowla south must be avoided by harvesters. This prevents any interactions in this freshwater habitat. • Harvest-related activities are prohibited within the Burrishoole Catchment to ensure no impact on catchment, connected lakes, fish and otters. • Harvest-related activities are prohibited at Lough Furnace. This will ensure that there are no negative impacts on fish resources. <p>Other aspects which reduce risk to Otter <i>Lutra Lutra</i>:</p> <ul style="list-style-type: none"> ➤ Harvest activities will not require construction of barriers which would affect access to sites of habitats. ➤ Since harvested seaweed will be collected by a pick vessel provided by BioAtlantis, seaweed will not be transferred by land, thus reducing potential impacts on otters in these locations and species and habitats of relevance to otters within the broader coastal ecosystem. ➤ As stated on page 22 of the NIS, approximately 2-4 harvesters are permitted on small-medium sized sites. Medium to large islands may require between 4-6, while larger islands will likely require approximately 6-10 harvesters. Thus, the low number of people over a wide area reduces the potential for anthropogenic impacts, and in turn will reduce the potential for interactions with otters on the foreshore. ➤ Map 8 of NPWS (2011) identifies a number of linear habitats. These will not be damaged or blocked in any way, therefore ensuring that otters have uninterrupted access to the marine zone. <p>Food security to Otter <i>Lutra Lutra</i></p> <p>According to the conservation objectives described by NPWS (2011) and references therein, Otter <i>Lutra Lutra</i> has a broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater and wrasse and rockling in coastal waters. On page 65 of our application, we identify the Burrishoole Catchment area of Clew Bay as representing an important habitat for migratory fish species such as trout and salmon, and is regarded as a major European and World Index site. In particular, sea trout and salmon smolts enter the sea at Clew Bay, while post-smolt and adult sea trout also feed within the bay. On this basis we have omitted the Burrishoole Channel from our application. This is marked in Appendix 2 in Map BioA_10-14-001.1. We also identify Lough Furnace in our application, a rare deep, permanently stratified, saline lake lagoon located at the north-eastern corner of Clew Bay, which hosts an important population of eel. Exclusion of these sites from the harvesting plan ensures that potential impacts on Otter <i>Lutra Lutra</i> food supply are reduced. It also prevents impacts on important life-cycle stages of trout or salmon.</p> <p>Hand harvesting will take place at low tide and this will ensure that there</p>			
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		<p>are no direct impacts on fish species such as wrasse and rockling, which are important prey species to Otter <i>Lutra Lutra</i>. BioAtlantis will manage activities in a sustainable manner to prevent overharvesting of <i>A. nodosum</i>, prevent <i>A. nodosum</i> mortality and in turn, circumvent any potential for negative effects on species further along the food chain, e.g. fish & otters. As regard the broader diet of Otter <i>Lutra Lutra</i>, mitigation measures are in place to ensure that understory species within the <i>A. nodosum</i> canopy are protected and that bycatch including crustaceans and other species identified on the collection vessel will be returned to the water. These mitigation measures are outlined in the NIS and Code of Practice.</p> <p>Training of harvesters: As described in the Code of Practice (Appendix 4 to our application), harvesters will receive appropriate training on the biological requirements and behaviour of sensitive harbour seal, otters and birds by biologists in BioAtlantis. Support will also be provided by engineers who will ensure that marine and navigation aspects when approaching or avoiding sensitive sites are explained. Training is scheduled to take place during month 1 of the operational phase. Verification of understanding of the training and regular auditing of the system by BioAtlantis will ensure standards are maintained. Harvesters will be trained in all aspects of the Code of Practice as it pertains to otters. Data provided by "Island Otterwatch" will form a basis for training harvesters and in making them aware of the distribution and sighting of otters sites in Clew Bay. This will be of interest to harvesters who own land adjoining the foreshore where otters have been spotted. As part of their training, harvesters in coastal areas will also be made aware of Map 8 of NPWS (2011), which identifies freshwater aquatic linear habitats, which harvesters must not block or damage in any way. This will be part of the training required of harvesters as the operational phase begins in the first month of receiving the application licence. The requirement to train harvesters is stated in Appendix 4.</p>			
49	Limitations of Kelly et al., 2001	<p>As outlined in page 115 and 116 of our application, BioAtlantis will be assessing the potential impact of <i>A. nodosum</i> harvesting on biotope species throughout the long term period of ten years proposed in our licence. This will build on the finding by Kelly et al., 2001.</p>	72	1.3%	Yes ✓ See Appendix 1