Invitation to Tender

Biome Algae Limited

IGM027002 05112021

# Background/Introduction

Biome Algae Limited is a leading seaweed producer based in SW England. Founded in 2020, the company has a track record of growing high quality, traceable seaweed offshore in the most sustainable way possible. Biome provides wholesale seaweed and extracts which support food security and the biomaterials industry. The company has ambitious growth plans and is aiming to be a leading seaweed extract processor by 2025.

The purchase of this system is part of a grant funded application process and therefore procurement will be subject to grant approval of the project as a whole. We will compare tenders received on a lowest compliant tender basis only.

# Project Specifications

2.1 Chemical profile of *Saccharina latissimi* and *Laminaria digitata* (S) – Biomasses characterisation (SW). Analysis of SW to obtain chemical profile.

2.1.1 The seaweed will be chemically analysed, at a minimum for polysaccharides: carbohydrates, proteins, high value extracts, pigments, minerals, phenolics, cellulose, lipids and other secondary products (a profiling of the seaweed).

2.1.2 Identify values (refer to 2.1.1 above) in terms of chemical profile (purity/extract quantity and range of molecules) as well as identify additional targeted molecules for final biorefining plan and adequate processes to obtain them. This will involve testing an adequate range of samples from the St Austell Bay farm site, with an additional farm site for comparison.

2.1.3 Dried vs fresh (SW). Analyse chemical profile of 6 fresh samples compared to 6 dried samples and 6 mixed samples per site to determine whether drying impacts chemical profile of SW. Samples. These will come from the St Austell Bay farm site. And an additional site for comparison.

2.1.4 Spatial variation. Assess samples to determine whether the spatial location impacts the chemical profile composition significantly (2.1.2). The locations will build on data from samples within the St Austell farm site with an additional farm site in Devon/Cornwall (6 fresh and dried samples) as per 2.1.3) for comparison (location to be determined). This will involve adequate sampling between and within sites to determine a reliable statistical analysis for analysis (2.1.5). This should be three within site samples at a minimum.

2.1.5 Building on 2.1.2 to 2.1.4, the samples analysed will ensure that multiple samples are taken spatially from within a single farm site, to ensure compliance with statistical models in terms of analysis to eradicate intra-variability within a site (6 spatially variable samples within the site). Sampling should be random within that site. This is fundamental for all sites being compared. This gives a site-specific analysis of single site variability. Samples are taken randomly within each site for comparison to produce robust data. Farm sites are St Austell and a comparative site within the South West. Quantities are indicated as being below 5 Kg.

2.2 Development of extraction protocols for alginates and other extracts under 2.1.1, with research into their characterization and positioning on the commercial market. The aim of this is to optimise their extraction and purification using a design/test/optimise approach which also identifies the use of these specific extracts and their potential market value.

2.2.1 As part of 2.2, adapt and test industrial protocols to optimise high-value alginate yield from SW species. Determine and recommend optimum protocol in a report; protocol recommended must be oriented to be as neutral as possible and avoid high chemical/heat/pressure inputs (aim to avoid environmental harm). The report is to include test data to support the recommendation. Alginates are the primary target but other extracts would be important to identify and gather data on.

2.2.2 In the case that there is significant spatial variability between physical sites apply the same extraction protocol on two SW batches (for both dried and fresh) to establish refining techniques and methodology for both. This will depend on spatial variability and may not be needed if no significant difference is detected within data sets (evidence required). This will involve small quantities below 5 Kg.

2.2.3 As a priority, characterisation of all alginates extracted from both species. Determine the properties of SW alginates from both species to include chemical composition and ratio, molecular weight, viscosity and gel strength, as well as general aspect (colour, smell).

2.2.4 Identify potential commercial applications of SW alginates by

a. Chemical and rheological (viscosity) analyses, placing SW alginates on commercial range

b. The end product market for SW alginates at this step and provide a report

c. Participate in a half day meeting to decide on agreed commercial value of alginate properties based on outcomes of this first stage

2.3 Integrate extraction process at semi-lab scale. Identify main identified extractable products with valuable by-products, in a bio refinery model with prototype designs that incorporate knowledge and data from 2.1-2.2.4. This will help determine the final blueprint for an engineering designed biorefinery blueprint – the main deliverable from this project.

2.3.1 Replicate Alginate extraction process with larger quantities of SW (2 x 5kg) from the same batch (including purification and characteristic analyses). Replicates are needed to ensure robust data (multiple sample batches). The increased scale also improves data quality and outcomes. The scale up is required to check small quantity analysis matches large batch quantity analysis. This is outside of testing at comparable sites or within sites. This is to determine the robustness of the process on multiple samples from same sites. And to determine final blueprint for an engineering-designed biorefinery blueprint – the main deliverable from this project.

2.3.2 Replicate Alginate extraction with preliminary step to recover first metabolites to include a minimum of pigments, phenolics and an analysis of first liquids co-fractions will contribute to the biorefinery design (mineral, polyols, sugars, cellulose and proteins).

2.3.3 In terms of testing dried, fresh and a mix of both: Three different preliminary maceration\* will be tested for each site and within sites –resultant liquids will be analysed following analyses mentioned in 2.1.1. and 2.3.2. Adequate samples will be tested as detailed in 2.1.1. to 2.3.2. This will be at lab-scale and will result in an engineering level, detailed blue-print for a biorefinery plant for multiple extraction from Biome seaweeds.

(\*maceration = process of softening a solid by soaking)

2.3.4 Design material prototypes (biorefining unit capable of multiple extraction) and in-built processes to obtain the end-products/extracts using the dried extract alginates and bi-products produced across 2.1.1 to 2.3.2. This involves the designing of an operation bio-refining unit (blueprint) to extract multiple extracts using appropriate methods as described in 2.1.1 to 2.3.3. The blueprint for a lab-scale tested biorefinery (key technology) will be a key deliverable of the project.

2.3.5 End-product specification dependent on Biome Algae commercial customer requirements: Biome, as the commercial customer is looking for extracts in various states as per customer requirements (e.g. gel/powder) that can be applied to bio packaging, film and textile markets, Aspects to be considered: thickening, gelling, hydro-soluble material or drying. This will become more apparent as the basic extraction research unfolds and reveals results. These will all be built into the bio-refining blueprint as per 2.3.4.

2.3.6 Provide a report on the characterisation of the solid pulp by-products obtained after alginate extraction to cover, as a minimum, soluble polysaccharides, proteins, pigments, minerals, phenolic, cellulose, lipids. However, it should be noted that Biome expects cellulose recovery and protein would be an integral part of the biorefining process, alongside alginates, under 2.3.5 as a minimum.

2.4 Final Project Meeting. This will decide on commercial value of these by-products based on outcomes of this first stage; allow half a man day.

# ITT Timetable

The anticipated timetable for submission of the tender and commission milestones are set out below:

|  |  |
| --- | --- |
| Activity | Date |
| Date ITT available on Contracts Finder | 8 November 2021 |
| Last date for raising queries | 12 November 2021 |
| Last date for clarifications to queries | 15 November 2021 |
| Deadline to return ITT | 26 November 2021 |
| Evaluation of ITT | 29 November 2021 |
| Award of Contract | This is subject to successfully obtaining grant funding and will normally be no later than 90 days from contract evaluation |

# Conflicts of Interest

Please provide a statement with regards to a conflict of interest for this procurement through the provision of either:-

A Declaration that to your knowledge there is no conflict of interest between your company and Biome Algae Limited that is likely to influence the outcome of this procurement either directly or indirectly through financial, economic or other personal interest which might be perceived to compromise their impartiality and independence in the contexts of this procurement procedure.

Or

A Declaration that there is a likely conflict of interest between your company and Biome Algae Limited that is likely to influence the outcome of this procurement either directly or indirectly through financial, economic or other personal interest which might be perceived to compromise their impartiality and independence in the contexts of this procurement procedure, please provide details of this connection.

This will permit Biome Algae Limited, that in the event of a conflict of interest, appropriate steps are taken to ensure that the evaluation of any submission will be undertaken by an independent and impartial party.

**Exclusion**

Biome Algae Limited shall exclude applicants from participation in this procurement procedure where they have established or are otherwise aware that the applicant, to include administrative, management or supervisory staff that have powers of representation, decision or control of the applicants company, has been the subject of a conviction by final judgment of one of the following reasons:-

Participation in a criminal organisation

Corruption

Fraud

Terrorist offences or offences linked to terrorist activities

Money laundering or terrorist financing

Child labour and other forms of trafficking in human beings

# Consortium or sub-contracting

Where a consortium or sub-contracting approach is proposed, all information requested should be given in respect of the proposed prime contractor or consortium leader. Relevant information should also be provided in respect of consortium members or sub-contractors who will play a significant (greater than 25%) role in the delivery of the services under any ensuing Contract.

# Tender Application Requirements

Please include:

1. Confirmation that **you the supplier** are able to meet the requirements outlined in the brief above.
2. **Date** your response, used our company’s full postal address (albeit you submission will be by email) and included the **Reference: IGM027002 05112021**
3. Details of who to **contact** in your company in relation to this tender
4. **Company registration number** and **VAT number** (if appropriate)
5. **Completed** **Compliancy Matrix,** Enclosure 1, with costs stated in Pounds Sterling, with and without VAT

# Intellectual Property (IP)

By submitting a tender application, the tenderer acknowledges that the copyright to all material and any arising Intellectual Property produced during the commission of this tender will be the property of Biome Algae Limited. This includes materials, data on chemical analyses, all resultant data from the project, all knowledge gained from the project, reports generated as a result of the project and the biorefinery blueprint.

# Tender Scoring Criteria

The tender will be scored only on their compliance to the specification set out in section 2 and awarded to the lowest compliant tender.

# Tender Returns

Tenders must be returned by email

Tenders are to be returned by:-

Latest date to be returned: **26 November 2021**

Latest time to be returned: **17:00 pm**

**Email,** tenders should be sent electronically to h.atkinson@biomealgae.co.uk with the following message **clearly noted in the Subject box; “**ITT Response to Biome Algae Limited IGM027002 05112021”

Tenderers are advised to request an acknowledgement of receipt of their email.

# Clarification

There will not be any negotiations of any of the substantive terms of the Tender Documents. Only clarification queries will be answered. Any clarification queries arising from the Tender Documents which may have a bearing on the offer should be raised as soon as possible in writing. The deadline for clarification questions is as per the tender timetable (section 3). All e-mailed queries should be sent to:-

Name: Humphrey Atkinson

E-mail: h.atkinson@biomealgae.co.uk

No representation by way of explanation or otherwise to persons or corporations tendering or desirous of tendering as to the meaning of the tender, Contract or other Tender Documents or as to any other matter or thing to be done under the proposed contract shall bind us unless such representation is in writing and duly signed by Dr Angela Mead of Biome Algae Limited. All such correspondence shall be returned with the Tender Documents and shall form part of the Contract.

Tenderers must provide a single point of contact in their organisation for all contact between the Tenderer and Biome Algae Limited

Responses to any queries will be shared through Contracts Finder website

# Disclaimer

The issue of this documentation does not commit Biome Algae Limited to award any contract pursuant to the bid process or enter into a contractual relationship with any provider of the service. Nothing in the documentation or in any other communications made between Biome Algae Limited or its agents and any other party, or any part thereof, shall be taken as constituting a contract, agreement or representation between Biome Algae Limited and any other party (save for a formal award of contract made in writing by or on behalf of Biome Algae Limited).

Bidders must obtain for themselves, at their own responsibility and expense, all information necessary for the preparation of their tender responses. Information supplied to bidders by Biome Algae Limited or any information contained in Biome Algae Limited’s publications are supplied only for general guidance in the preparation of the tender response. Bidders must satisfy themselves by their own investigations as to the accuracy of any such information and no responsibility is accepted by Biome Algae Limited for any loss or damage of whatever kind and howsoever caused arising from the use by bidders of such information.

Bidders shall be responsible for their own costs and expenses in connection with or arising out of their response. Biome Algae Limited reserves the right to vary or change all or any part of the basis of the procedures for the procurement process at any time or not to proceed with the proposed procurement at all.

Cancellation of the procurement process (at any time) under any circumstances will not render Biome Algae Limited liable for any costs or expenses incurred by bidders during the procurement process.

Enclosures:

1. Compliancy Matrix