



Department  
for Environment  
Food & Rural Affairs

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██████████  
Bangor University  
College Road  
Bangor  
Gwynedd  
LL57 2DG

**Our ref:** FA0172  
**Date:** 10/01/2019

Dear ██████████

## **Award of contract for the supply of Identification of Biological Assays to Authenticate Basmati Rice Varieties**

Following your tender for the supply of Identification of Biological Assays to Authenticate Basmati Rice Varieties to the Department for Environment Food & Rural Affairs, we are pleased to award this contract to you.

This letter (Award Letter) and its Annexes set out the terms of the contract between the Department for Environment Food & Rural Affairs as the Customer and Bangor University as the Contractor for the provision of the Services. Unless the context otherwise requires, capitalised expressions used in this Award Letter have the same meanings as in the terms and conditions of contract set out in Annex 1 to this Award Letter (the “**Conditions**”). In the event of any conflict between this Award Letter and the Conditions, this Award Letter shall prevail. Please do not attach any Contractor terms and conditions to this Award Letter as they will not be accepted by the Customer and may delay the conclusion of the Agreement.

For the purposes of the Agreement, the Customer and the Contractor agree as follows:

The Services shall be performed at the Contractor’s premises (Bangor University, College Road, Bangor, Gwynedd, LL57 2DG).

Some services will be sub-contracted out to LGC Genomics Ltd and carried out on their premises at Pindar Rd, Hoddesdon EN11 0WZ.

- 1) The charges for the Services shall be as set out in Schedule 3 of the Contract.

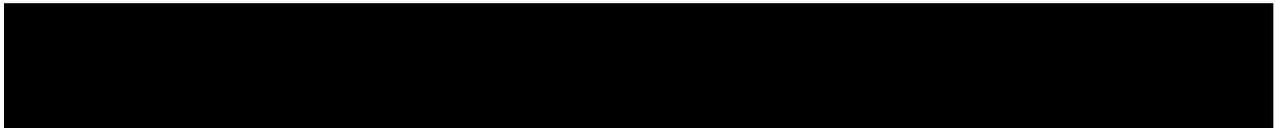
- 2) The Specification of the Services to be supplied is as set out in Schedule 2 of the Contract.
- 3) The Term shall commence on 01/01/2019 and the Expiry Date shall be 31/08/2019.
- 4) The address for notices of the Parties are:

**Customer**

Defra  
2<sup>nd</sup> Floor, Seacole Block  
Marsham Street  
London  
SW1 4DF

**Contractor**

Bangor University  
College Road  
Bangor  
Gwynedd  
LL57 2DG



- 5) The following persons are Key Personnel for the purposes of the Agreement:

Name	Title
------	-------

	Dr
--	----

	Mr
--	----

- 6) For the purposes of the Agreement the Staff Vetting Procedures, data security requirements, equality and diversity policy and environmental policy are stated in the terms and conditions of the contract.
- 7) The Customer may require the Contractor to ensure that any person employed in the provision of the Services has undertaken a Disclosure and Barring Service check. The Contractor shall ensure that no person who discloses that he/she has a conviction that is relevant to the nature of the Services, relevant to the work of the Customer, or is of a type otherwise advised by the Customer (each such conviction a "**Relevant Conviction**"), or is found by the Contractor to have a Relevant Conviction (whether as a result of a police check, a Disclosure and Barring Service check or otherwise) is employed or engaged in the provision of any part of the Services.

**Payment**

All invoices should be sent, quoting a valid purchase order number (PO Number), to: [Accounts-Payable.def@sscl.gov.uk](mailto:Accounts-Payable.def@sscl.gov.uk) or Shared Services Connected Limited, PO Box 790, Phoenix House, Celtic Springs Business Park, Newport, Gwent, NP10 8FZ. Within 10 Working Days of receipt of your acceptance of this letter via Bravo, we will send you a unique PO Number. You must be in receipt of a valid PO Number before submitting an invoice.

To avoid delay in payment it is important that the invoice is compliant and that it includes a valid PO Number, PO Number item number (if applicable) and the details (name and telephone number) of your Customer contact (i.e. Contract Manager). Non-compliant invoices will be sent back to you, which may lead to a delay in payment. If you have a query regarding an outstanding payment please contact our Accounts Payable section either by email to [Accounts-Payable.def@sscl.gov.uk](mailto:Accounts-Payable.def@sscl.gov.uk) or by telephone 0845 603 7262 between 09:00-17:00 Monday to Friday.

## **Liaison**

For general liaison your contact will continue to be [REDACTED] or in their absence, [REDACTED]

We thank you for your co-operation to date, and look forward to forging a successful working relationship resulting in a smooth and successful supply of the Services. Acceptance of the award of this contract will be made by electronic signature carried out in accordance with the 1999 EU Directive 99/93 (Community framework for electronic signatures) and the UK Electronic Communications Act 2000. Acceptance of the offer comprised in this Agreement must be made within 7 days from the date of this Award Letter and the Agreement is formed on the date on which the Contractor communicates acceptance on the Customer's electronic contract management system ("Bravo"). No other form of acknowledgement will be accepted. Please remember to quote the reference number above in any future communications relating to this contract.

Yours sincerely

[REDACTED]



Department  
for Environment  
Food & Rural Affairs

# **Short Form Contract Contract for Identification of Biological Assays to Authenticate Basmati Rice Varieties**

**Contract Reference FA0172**

**December 2018**

## Contents

1. Interpretation .....	4
2. Basis of Agreement .....	8
3. Supply of Services .....	8
4. Term .....	9
5. Charges, Payment and Recovery of Sums Due .....	9
6. Premises and equipment.....	10
7. Staff and Key Personnel.....	11
8. Assignment and sub-contracting.....	12
9. Intellectual Property Rights.....	12
10. Governance and Records .....	13
11. Confidentiality, Transparency and Publicity .....	14
12. Freedom of Information.....	15
13. Protection of Personal Data and Security of Data.....	16
14. Liability.....	20
15. Force Majeure.....	21
16. Termination.....	21
17. Compliance.....	23
18. Prevention of Fraud and Corruption.....	24
19. Dispute Resolution.....	24
20. General .....	25
21. Notices.....	26
22. Governing Law and Jurisdiction .....	26
SCHEDULE 1 - PROCESSING, PERSONAL DATA AND DATA SUBJECTS.....	27
SCHEDULE 2 - SPECIFICATION.....	26

SCHEDULE 3 - PAYMENT SCHEDULE.....	35
Annex 1 - KPIs.....	36
Annex 2 - Travel and Subsistence Policy.....	37
Annex 3 - Varieties of Basmati Rice that can use the description 'Basmati'.....	38
Annex 4 - Tender Response from the Contractor.....	39
Annex 5 - Contractor Clarifications.....	50

# 1. Interpretation

## 1.1 In these terms and conditions:

Term	Description
“Agreement”	means the contract between (i) the Customer acting as part of the Crown and (ii) the Contractor constituted by the Contractor’s acceptance of the Award Letter via Bravo;
“Award Letter”	means the letter from the Customer to the Contractor printed above these terms and conditions;
“Bravo”	means the Customer’s electronic contract management system
“Central Government Body”	means a body listed in one of the following sub-categories of the Central Government classification of the Public Sector Classification Guide, as published and amended from time to time by the Office for National Statistics:  Government Department;  Non-Departmental Public Body or Assembly Sponsored Public Body (advisory, executive, or tribunal);  Non-Ministerial Department; or  Executive Agency;
“Charges”	means the charges for the Services as specified in the Award Letter;
“Confidential Information”	means all information, whether written or oral (however recorded), provided by the disclosing Party to the receiving Party and which (i) is known by the receiving Party to be confidential; (ii) is marked as or stated to be confidential; or (iii) ought reasonably to be considered by the receiving Party to be confidential;
“Contractor”	means the person named as Contractor in the Award Letter;
“Controller”	has the meaning given in the GDPR;

“Customer”	means the person identified in the letterhead of the Award Letter;
“Data Loss Event”	means any event that results, or may result, in unauthorised access to Personal Data held by the Contractor under this Agreement, and/or actual or potential loss and/or destruction of Personal Data in breach of this Agreement, including any Personal Data Breach;
“Data Protection Impact Assessment”	means an assessment by the Controller of the impact of the envisaged processing on the protection of Personal Data;
“Data Protection Legislation”	means (i) the GDPR, the LED and any applicable national implementing Laws as amended from time to time (ii) the DPA 2018 to the extent that it relates to processing of personal data and privacy; and (iii) all applicable Law about the processing of personal data and privacy;
“Data Protection Officer”	has the meaning given in the GDPR;
“Data Subject”	has the meaning given in the GDPR;
“Data Subject Request”	means a request made by, or on behalf of, a Data Subject in accordance with rights granted pursuant to the Data Protection Legislation to access their Personal Data;
“DPA 2018”	means the Data Protection Act 2018;
“Expiry Date”	means the date for expiry of the Agreement as set out in the Award Letter;
“FOIA”	means the Freedom of Information Act 2000;
“GDPR”	means the General Data Protection Regulation (Regulation (EU) 2016/679);
“Information”	has the meaning given under section 84 of the FOIA;
“Key Personnel”	means any persons specified as such in the Award Letter or otherwise notified as such by the Customer to the Contractor in writing;

“Law”	means any law, statute, subordinate legislation within the meaning of section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements of any regulatory body with which the relevant Party is bound to comply;
“LED”	means Law Enforcement Directive (Directive (EU) 2016/680);
“Party”	the Contractor or the Customer (as appropriate) and “Parties” shall mean both of them;
“Personal Data”	has the meaning given in the GDPR;
“Personal Data Breach”	has the meaning given in the GDPR;
“Processor”	has the meaning given in the GDPR;
“Protective Measures”	means appropriate technical and organisational measures which may include: pseudonymising and encrypting Personal Data, ensuring confidentiality, integrity, availability and resilience of systems and services, ensuring that availability of and access to Personal Data can be restored in a timely manner after an incident, and regularly assessing and evaluating the effectiveness of the such measures adopted by it;
“Purchase Order Number”	means the Customer’s unique number relating to the order for Goods to be supplied by the Contractor to the Customer in accordance with the terms of the Agreement;
“Request for Information”	has the meaning set out in the FOIA or the Environmental Information Regulations 2004 as relevant (where the meaning set out for the term “request” shall apply);
“Services”	means the services to be supplied by the Contractor to the Customer under the Agreement;
“Specification”	means the specification for the Services (including as to quantity, description and quality) as specified in the Award Letter;

“Staff”	means all directors, officers, employees, agents, consultants and contractors of the Contractor and/or of any sub-contractor of the Contractor engaged in the performance of the Contractor’s obligations under the Agreement;
“Staff Vetting Procedures”	means vetting procedures that accord with good industry practice or, where applicable, the Customer’s procedures for the vetting of personnel as provided to the Contractor from time to time;
“Sub-processor”	means any third party appointed to process Personal Data on behalf of the Contractor related to this Agreement;
“Term”	means the period from the start date of the Agreement set out in the Award Letter to the Expiry Date as such period may be extended in accordance with Clause 4.2 or terminated in accordance with the terms and conditions of the Agreement;
“VAT”	means value added tax in accordance with the provisions of the Value Added Tax Act 1994; and
“Working Day”	means a day (other than a Saturday or Sunday) on which banks are open for business in the City of London.

1.2 In these terms and conditions, unless the context otherwise requires:

1.2.1 references to numbered clauses are references to the relevant clause in these terms and conditions;

1.2.2 any obligation on any Party not to do or omit to do anything shall include an obligation not to allow that thing to be done or omitted to be done;

1.2.3 the headings to the clauses of these terms and conditions are for information only and do not affect the interpretation of the Agreement;

1.2.4 any reference to an enactment includes reference to that enactment as amended or replaced from time to time and to any subordinate legislation or byelaw made under that enactment; and

1.2.5 the word ‘including’ shall be understood as meaning ‘including without limitation’.

## 2. Basis of Agreement

- 2.1 The Award Letter constitutes an offer by the Customer to purchase the Services subject to and in accordance with the terms and conditions of the Agreement.
- 2.2 The offer comprised in the Award Letter shall be deemed to be accepted by the Contractor on receipt by the Customer of the Contractor's notification of acceptance via Bravo within 7 days of the date of the Award Letter.

## 3. Supply of Services

- 3.1 In consideration of the Customer's agreement to pay the Charges, the Contractor shall supply the Services to the Customer for the Term subject to and in accordance with the terms and conditions of the Agreement.
- 3.2 In supplying the Services, the Contractor shall:
  - 3.2.1 co-operate with the Customer in all matters relating to the Services and comply with all the Customer's instructions;
  - 3.2.2 perform the Services with all reasonable care, skill and diligence in accordance with good industry practice in the Contractor's industry, profession or trade;
  - 3.2.3 use Staff who are suitably skilled and experienced to perform tasks assigned to them, and in sufficient number to ensure that the Contractor's obligations are fulfilled in accordance with the Agreement;
  - 3.2.4 ensure that the Services shall conform with all descriptions and specifications set out in the Specification;
  - 3.2.5 comply with all applicable laws; and
  - 3.2.6 provide all equipment, tools and vehicles and other items as are required to provide the Services.
- 3.3 The Customer may by written notice to the Contractor at any time request a variation to the scope of the Services. In the event that the Contractor agrees to any variation to the scope of the Services, the Charges shall be subject to fair and reasonable adjustment to be agreed in writing between the Customer and the Contractor.

## 4. Term

- 4.1 The Agreement shall take effect on the date specified in Award Letter and shall expire on the Expiry Date, unless it is otherwise extended in accordance with clause 4.2 or terminated in accordance with the terms and conditions of the Agreement.
- 4.2 The Customer may extend the Agreement for a period of up to 6 months by giving not less than 10 Working Days' notice in writing to the Contractor prior to the Expiry Date. The terms and conditions of the Agreement shall apply throughout any such extended period.

## 5. Charges, Payment and Recovery of Sums Due

- 5.1 The Charges for the Services shall be as set out in the Award Letter and shall be the full and exclusive remuneration of the Contractor in respect of the supply of the Services. Unless otherwise agreed in writing by the Customer, the Charges shall include every cost and expense of the Contractor directly or indirectly incurred in connection with the performance of the Services.
- 5.2 All amounts stated are exclusive of VAT which shall be charged at the prevailing rate. The Customer shall, following the receipt of a valid VAT invoice, pay to the Contractor a sum equal to the VAT chargeable in respect of the Services.
- 5.3 The Contractor shall invoice the Customer as specified in the Agreement. Each invoice shall include such supporting information required by the Customer to verify the accuracy of the invoice, including the relevant Purchase Order Number and a breakdown of the Services supplied in the invoice period.
- 5.4 In consideration of the supply of the Services by the Contractor, the Customer shall pay the Contractor the invoiced amounts no later than 30 days after verifying that the invoice is valid and undisputed and includes a valid Purchase Order Number. The Customer may, without prejudice to any other rights and remedies under the Agreement, withhold or reduce payments in the event of unsatisfactory performance.
- 5.5 If there is a dispute between the Parties as to the amount invoiced, the Customer shall pay the undisputed amount. The Contractor shall not suspend the supply of the Services unless the Contractor is entitled to terminate the Agreement for a failure to pay undisputed sums in accordance with clause 16.4. Any disputed amounts shall be resolved through the dispute resolution procedure detailed in clause 19.

- 5.6 If a payment of an undisputed amount is not made by the Customer by the due date, then the Customer shall pay the Contractor interest at the interest rate specified in the Late Payment of Commercial Debts (Interest) Act 1998.
- 5.7 Where the Contractor enters into a sub-contract, the Contractor shall include in that sub-contract:
- 5.7.1 provisions having the same effects as clauses 5.3 to 5.6 of this Agreement; and
- 5.7.2 a provision requiring the counterparty to that sub-contract to include in any sub-contract which it awards provisions having the same effect as 5.3 to 5.7 of this Agreement.
- 5.8 In this clause 5.8, “sub-contract” means a contract between two or more Contractors, at any stage of remoteness from the Authority in a subcontracting chain, made wholly or substantially for the purpose of performing (or contributing to the performance of) the whole or any part of this Agreement.
- 5.9 If any sum of money is recoverable from or payable by the Contractor under the Agreement (including any sum which the Contractor is liable to pay to the Customer in respect of any breach of the Agreement), that sum may be deducted unilaterally by the Customer from any sum then due, or which may come due, to the Contractor under the Agreement or under any other agreement or contract with the Customer. The Contractor shall not be entitled to assert any credit, set-off or counterclaim against the Customer in order to justify withholding payment of any such amount in whole or in part.

## 6. Premises and equipment

- 6.1 If necessary, the Customer shall provide the Contractor with reasonable access at reasonable times to its premises for the purpose of supplying the Services. All equipment, tools and vehicles brought onto the Customer’s premises by the Contractor or the Staff shall be at the Contractor’s risk.
- 6.2 If the Contractor supplies all or any of the Services at or from the Customer’s premises, on completion of the Services or termination or expiry of the Agreement (whichever is the earlier) the Contractor shall vacate the Customer’s premises, remove the Contractor’s plant, equipment and unused materials and all rubbish arising out of the provision of the Services and leave the Customer’s premises in a clean, safe and tidy condition. The Contractor shall be solely responsible for making good any damage to the Customer’s premises or any objects contained on the Customer’s premises which is caused by the Contractor or any Staff, other than fair wear and tear.

- 6.3 If the Contractor supplies all or any of the Services at or from its premises or the premises of a third party, the Customer may, during normal business hours and on reasonable notice, inspect and examine the manner in which the relevant Services are supplied at or from the relevant premises.
- 6.4 The Customer shall be responsible for maintaining the security of its premises in accordance with its standard security requirements. While on the Customer's premises the Contractor shall, and shall procure that all Staff shall, comply with all the Customer's security requirements.
- 6.5 Where all or any of the Services are supplied from the Contractor's premises, the Contractor shall, at its own cost, comply with all security requirements specified by the Customer in writing.
- 6.6 Without prejudice to clause 3.2.6, any equipment provided by the Customer for the purposes of the Agreement shall remain the property of the Customer and shall be used by the Contractor and the Staff only for the purpose of carrying out the Agreement. Such equipment shall be returned promptly to the Customer on expiry or termination of the Agreement.
- 6.7 The Contractor shall reimburse the Customer for any loss or damage to the equipment (other than deterioration resulting from normal and proper use) caused by the Contractor or any Staff. Equipment supplied by the Customer shall be deemed to be in a good condition when received by the Contractor or relevant Staff unless the Customer is notified otherwise in writing within 5 Working Days.

## 7. Staff and Key Personnel

- 7.1 If the Customer reasonably believes that any of the Staff are unsuitable to undertake work in respect of the Agreement, it may, by giving written notice to the Contractor:
- 7.1.1 refuse admission to the relevant person(s) to the Customer's premises;
  - 7.1.2 direct the Contractor to end the involvement in the provision of the Services of the relevant person(s); and/or
  - 7.1.3 require that the Contractor replace any person removed under this clause with another suitably qualified person and procure that any security pass issued by the Customer to the person removed is surrendered,
- and the Contractor shall comply with any such notice.
- 7.2 The Contractor shall:
- 7.2.1 ensure that all Staff are vetted in accordance with the Staff Vetting Procedures;

- 7.2.2 if requested, provide the Customer with a list of the names and addresses (and any other relevant information) of all persons who may require admission to the Customer's premises in connection with the Agreement; and
- 7.2.3 procure that all Staff comply with any rules, regulations and requirements reasonably specified by the Customer.
- 7.3 Any Key Personnel shall not be released from supplying the Services without the agreement of the Customer, except by reason of long-term sickness, maternity leave, paternity leave, termination of employment or other extenuating circumstances.
- 7.4 Any replacements to the Key Personnel shall be subject to the prior written agreement of the Customer (not to be unreasonably withheld). Such replacements shall be of at least equal status or of equivalent experience and skills to the Key Personnel being replaced and be suitable for the responsibilities of that person in relation to the Services.

## **8. Assignment and sub-contracting**

- 8.1 The Contractor shall not without the written consent of the Customer assign, sub-contract, novate or in any way dispose of the benefit and/ or the burden of the Agreement or any part of the Agreement. The Customer may, in the granting of such consent, provide for additional terms and conditions relating to such assignment, sub-contract, novation or disposal. The Contractor shall be responsible for the acts and omissions of its sub-contractors as though those acts and omissions were its own.
- 8.2 Where the Customer has consented to the placing of sub-contracts, the Contractor shall, at the request of the Customer, send copies of each sub-contract, to the Customer as soon as is reasonably practicable.
- 8.3 The Customer may assign, novate, or otherwise dispose of its rights and obligations under the Agreement without the consent of the Contractor provided that such assignment, novation or disposal shall not increase the burden of the Contractor's obligations under the Agreement.

## **9. Intellectual Property Rights**

- 9.1 All intellectual property rights in any materials provided by the Customer to the Contractor for the purposes of this Agreement shall remain the property of the Customer but the Customer hereby grants the Contractor a royalty-free, non-exclusive and non-transferable licence to use such materials as required until

termination or expiry of the Agreement for the sole purpose of enabling the Contractor to perform its obligations under the Agreement.

- 9.2 All intellectual property rights in any materials created or developed by the Contractor pursuant to the Agreement or arising as a result of the provision of the Services shall vest in the Contractor. If, and to the extent, that any intellectual property rights in such materials vest in the Customer by operation of law, the Customer hereby assigns to the Contractor by way of a present assignment of future rights that shall take place immediately on the coming into existence of any such intellectual property rights all its intellectual property rights in such materials (with full title guarantee and free from all third party rights).
- 9.3 The Contractor hereby grants the Customer:
- 9.3.1 a perpetual, royalty-free, irrevocable, non-exclusive licence (with a right to sub-license) to use all intellectual property rights in the materials created or developed pursuant to the Agreement and any intellectual property rights arising as a result of the provision of the Services; and
- 9.3.2 a perpetual, royalty-free, irrevocable and non-exclusive licence (with a right to sub-license) to use:
- a. any intellectual property rights vested in or licensed to the Contractor on the date of the Agreement; and
  - b. any intellectual property rights created during the Term but which are neither created or developed pursuant to the Agreement nor arise as a result of the provision of the Services,
- including any modifications to or derivative versions of any such intellectual property rights, which the Customer reasonably requires in order to exercise its rights and take the benefit of the Agreement including the Services provided.
- 9.4 The Contractor shall indemnify, and keep indemnified, the Customer in full against all costs, expenses, damages and losses (whether direct or indirect), including any interest, penalties, and reasonable legal and other professional fees awarded against or incurred or paid by the Customer as a result of or in connection with any claim made against the Customer for actual or alleged infringement of a third party's intellectual property arising out of, or in connection with, the supply or use of the Services, to the extent that the claim is attributable to the acts or omission of the Contractor or any Staff.

## 10. Governance and Records

- 10.1. The Contractor shall:

- 10.1.1. attend progress meetings with the Customer at the frequency and times specified by the Customer and shall ensure that its representatives are suitably qualified to attend such meetings; and
- 10.1.2. submit progress reports to the Customer at the times and in the format specified by the Customer.
- 10.2. The Contractor shall keep and maintain until 6 years after the end of the Agreement, or as long a period as may be agreed between the Parties, full and accurate records of the Agreement including the Services supplied under it and all payments made by the Customer. The Contractor shall on request afford the Customer or the Customer's representatives such access to those records as may be reasonably requested by the Customer in connection with the Agreement.

## 11. Confidentiality, Transparency and Publicity

- 11.1. Subject to clause 11.2, each Party shall:
  - 11.1.1. treat all Confidential Information it receives as confidential, safeguard it accordingly and not disclose it to any other person without the prior written permission of the disclosing Party; and
  - 11.1.2. not use or exploit the disclosing Party's Confidential Information in any way except for the purposes anticipated under the Agreement.
- 11.2. Notwithstanding clause 11.1, a Party may disclose Confidential Information which it receives from the other Party:
  - 11.2.1. where disclosure is required by applicable law or by a court of competent jurisdiction;
  - 11.2.2. to its auditors or for the purposes of regulatory requirements;
  - 11.2.3. on a confidential basis, to its professional advisers;
  - 11.2.4. to the Serious Fraud Office where the Party has reasonable grounds to believe that the other Party is involved in activity that may constitute a criminal offence under the Bribery Act 2010;
  - 11.2.5. where the receiving Party is the Contractor, to the Staff on a need to know basis to enable performance of the Contractor's obligations under the Agreement provided that the Contractor shall procure that any Staff to whom it discloses Confidential Information pursuant to this clause 11.2.5 shall observe the Contractor's confidentiality obligations under the Agreement; and

11.2.6. where the receiving Party is the Customer:

- a) on a confidential basis to the employees, agents, consultants and contractors of the Customer;
- b) on a confidential basis to any other Central Government Body, any successor body to a Central Government Body or any company to which the Customer transfers or proposes to transfer all or any part of its business;
- c) to the extent that the Customer (acting reasonably) deems disclosure necessary or appropriate in the course of carrying out its public functions; or
- d) in accordance with clause 12.

and for the purposes of the foregoing, references to disclosure on a confidential basis shall mean disclosure subject to a confidentiality agreement or arrangement containing terms no less stringent than those placed on the Customer under this clause 11.

11.3. The Parties acknowledge that, except for any information which is exempt from disclosure in accordance with the provisions of the FOIA, the content of the Agreement is not Confidential Information and the Contractor hereby gives its consent for the Customer to publish this Agreement in its entirety to the general public (but with any information that is exempt from disclosure in accordance with the FOIA redacted) including any changes to the Agreement agreed from time to time. The Customer may consult with the Contractor to inform its decision regarding any redactions but shall have the final decision in its absolute discretion whether any of the content of the Agreement is exempt from disclosure in accordance with the provisions of the FOIA.

11.4. The Contractor shall not, and shall take reasonable steps to ensure that the Staff shall not, make any press announcement or publicise the Agreement or any part of the Agreement in any way, except with the prior written consent of the Customer.

## 12. Freedom of Information

12.1 The Contractor acknowledges that the Customer is subject to the requirements of the FOIA and the Environmental Information Regulations 2004 and shall:

12.1.1 provide all necessary assistance and cooperation as reasonably requested by the Customer to enable the Customer to comply with its obligations under the FOIA and the Environmental Information Regulations 2004;

- 12.1.2 transfer to the Customer all Requests for Information relating to this Agreement that it receives as soon as practicable and in any event within 2 Working Days of receipt;
- 12.1.3 provide the Customer with a copy of all Information belonging to the Customer requested in the Request for Information which is in its possession or control in the form that the Customer requires within 5 Working Days (or such other period as the Customer may reasonably specify) of the Customer's request for such Information; and
- 12.1.4 not respond directly to a Request for Information unless authorised in writing to do so by the Customer.
- 12.2 The Contractor acknowledges that the Customer may be required under the FOIA and the Environmental Information Regulations 2004 to disclose Information concerning the Contractor or the Services (including commercially sensitive information) without consulting or obtaining consent from the Contractor. In these circumstances the Customer shall, in accordance with any relevant guidance issued under the FOIA, take reasonable steps, where appropriate, to give the Contractor advance notice, or failing that, to draw the disclosure to the Contractor's attention after any such disclosure.
- 12.3 Notwithstanding any other provision in the Agreement, the Customer shall be responsible for determining in its absolute discretion whether any Information relating to the Contractor or the Services is exempt from disclosure in accordance with the FOIA and/or the Environmental Information Regulations 2004.

## **13. Protection of Personal Data and Security of Data**

- 13.1. The Parties acknowledge that for the purposes of the Data Protection Legislation, the Customer is the Controller and the Contractor is the Processor unless otherwise specified in Schedule 1. The only processing that the Contractor is authorised to do is listed in Schedule 1 by the Customer and may not be determined by the Contractor.
- 13.2. The Contractor shall notify the Customer immediately if it considers that any of the Customer's instructions infringe the Data Protection Legislation.
- 13.3. The Contractor shall provide all reasonable assistance to the Customer in the preparation of any Data Protection Impact Assessment prior to commencing any processing. Such assistance may, at the discretion of the Customer, include:

- a. a systematic description of the envisaged processing operations and the purpose of the processing;
- b. an assessment of the necessity and proportionality of the processing operations in relation to the Services;
- c. an assessment of the risks to the rights and freedoms of Data Subjects; and
- d. the measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of Personal Data.

13.4. The Contractor shall, in relation to any Personal Data processed in connection with its obligations under this Agreement:

- a. process that Personal Data only in accordance with Schedule 1 unless the Contractor is required to do otherwise by Law. If it is so required the Contractor shall promptly notify the Customer before processing the Personal Data unless prohibited by Law;
- b. ensure that it has in place Protective Measures which are appropriate to protect against a Data Loss Event, which the Customer may reasonably reject (but failure to reject shall not amount to approval by the Customer of the adequacy of the Protective Measures), having taken account of the:
  - i. nature of the data to be protected;
  - ii. harm that might result from a Data Loss Event;
  - iii. state of technological development; and
  - iv. cost of implementing any measures;
- c. ensure that :
  - i. the Staff do not process Personal Data except in accordance with this Agreement (and in particular Schedule 1);
  - ii. it takes all reasonable steps to ensure the reliability and integrity of any Staff who have access to the Personal Data and ensure that they:
    - 1. are aware of and comply with the Contractor's duties under this clause;
    - 2. are subject to appropriate confidentiality undertakings with the Contractor or any Sub-processor;
    - 3. are informed of the confidential nature of the Personal Data and do not publish, disclose or divulge any of the Personal Data to any

third party unless directed in writing to do so by the Customer or as otherwise permitted by this Agreement; and

4. have undergone adequate training in the use, care, protection and handling of Personal Data; and

d. not transfer Personal Data outside of the European Union unless the prior written consent of the Customer has been obtained and the following conditions are fulfilled:

i. the Customer or the Contractor has provided appropriate safeguards in relation to the transfer (whether in accordance with the GDPR Article 46 or LED Article 37) as determined by the Customer;

ii. the Data Subject has enforceable rights and effective legal remedies;

iii. the Contractor complies with its obligations under the Data Protection Legislation by providing an adequate level of protection to any Personal Data that is transferred (or, if it is not so bound, uses its best endeavours to assist the Customer in meeting its obligations); and

iv. the Contractor complies with any reasonable instructions notified to it in advance by the Customer with respect to the processing of the Personal Data;

e. at the written direction of the Customer, delete or return Personal Data (and any copies of it) to the Customer on termination of the Agreement unless the Contractor is required by Law to retain the Personal Data.

13.5. Subject to clause 13.6 the Contractor shall notify the Customer immediately if, in relation to any Personal Data processed in connection with its obligations under this Agreement, it:

a. receives a Data Subject Request (or purported Data Subject Request);

b. receives a request to rectify, block or erase any Personal Data;

c. receives any other request, complaint or communication relating to either Party's obligations under the Data Protection Legislation;

d. receives any communication from the Information Commissioner or any other regulatory authority;

e. receives a request from any third party for disclosure of Personal Data where compliance with such request is required or purported to be required by Law; or

f. becomes aware of a Data Loss Event.

- 13.6. The Contractor's obligation to notify under clause 13.5 shall include the provision of further information to the Customer in phases, as details become available.
- 13.7. Taking into account the nature of the processing, the Contractor shall provide the Customer with full assistance in relation to either Party's obligations under Data Protection Legislation in relation to any Personal Data processed in connection with its obligations under this Agreement and any complaint, communication or request made under Clause 13.5 (and insofar as possible within the timescales reasonably required by the Customer) including by promptly providing:
- a. the Customer with full details and copies of the complaint, communication or request;
  - b. such assistance as is reasonably requested by the Customer to enable the Customer to comply with a Data Subject Request within the relevant timescales set out in the Data Protection Legislation;
  - c. the Customer, at its request, with any Personal Data it holds in relation to a Data Subject;
  - d. assistance as requested by the Customer following any Data Loss Event;
  - e. assistance as requested by the Customer with respect to any request from the Information Commissioner's Office, or any consultation by the Customer with the Information Commissioner's Office.
- 13.8. The Contractor shall maintain complete and accurate records and information to demonstrate its compliance with this clause 13. This requirement does not apply where the Contractor employs fewer than 250 staff, unless:
- a. the Customer determines that the processing is not occasional;
  - b. the Customer determines the processing includes special categories of data as referred to in Article 9(1) of the GDPR or Personal Data relating to criminal convictions and offences referred to in Article 10 of the GDPR; or
  - c. the Customer determines that the processing is likely to result in a risk to the rights and freedoms of Data Subjects.
- 13.9. The Contractor shall allow for audits of its Personal Data processing activity by the Customer or the Customer's designated auditor.
- 13.10. Each Party shall designate its own Data Protection Officer if required by the Data Protection Legislation.
- 13.11. Before allowing any Sub-processor to process any Personal Data related to this Agreement, the Contractor must:

- a. notify the Customer in writing of the intended Sub-processor and processing;
  - b. obtain the written consent of the Customer;
  - c. enter into a written agreement with the Sub-processor which give effect to the terms set out in this clause 13 such that they apply to the Sub-processor; and
  - d. provide the Customer with such information regarding the Sub-processor as the Customer may reasonably require.
- 13.12. The Contractor shall remain fully liable for all acts or omissions of any of its Sub-processors.
- 13.13. The Customer may, at any time on not less than 30 Working Days' notice, revise this clause by replacing it with any applicable controller to processor standard clauses or similar terms forming part of an applicable certification scheme (which shall apply when incorporated by attachment to this Agreement).
- 13.14. The Parties agree to take account of any non-mandatory guidance issued by the Information Commissioner's Office. The Customer may on not less than 30 Working Days' notice to the Contractor amend this Agreement to ensure that it complies with any guidance issued by the Information Commissioner's Officer.
- 13.15. When handling Customer data (whether or not Personal Data), the Contractor shall ensure the security of the data is maintained in line with the security requirements of the Customer as notified to the Contractor from time to time.
- 13.16. This clause 13 shall apply during the Term and indefinitely after its expiry.

## 14. Liability

- 14.1 The Contractor shall not be responsible for any injury, loss, damage, cost or expense suffered by the Customer if and to the extent that it is caused by the negligence or wilful misconduct of the Customer or by breach by the Customer of its obligations under the Agreement.
- 14.2 Subject always to clauses 14.3 and 14.4:
- 14.2.1 the aggregate liability of the Contractor in respect of all defaults, claims, losses or damages howsoever caused, whether arising from breach of the Agreement, the supply or failure to supply of the Services, misrepresentation (whether tortious or statutory), tort (including negligence), breach of statutory duty or otherwise shall in no event exceed a sum equal to 125% of the Charges paid or payable to the Contractor; and

- 14.2.2 except in the case of claims arising under clauses 9.4 and 18.3, in no event shall the Contractor be liable to the Customer for any:
- a) loss of profits;
  - b) loss of business;
  - c) loss of revenue;
  - d) loss of or damage to goodwill;
  - e) loss of savings (whether anticipated or otherwise); and/or
  - f) any indirect, special or consequential loss or damage.
- 14.3 Nothing in the Agreement shall be construed to limit or exclude either Party's liability for:
- 14.3.1 death or personal injury caused by its negligence or that of its Staff;
  - 14.3.2 fraud or fraudulent misrepresentation by it or that of its Staff; or
  - 14.3.3 any other matter which, by law, may not be excluded or limited.
- 14.4 The Contractor's liability under the indemnity in clause 9.4 and 18.3 shall be unlimited.

## 15. Force Majeure

- 15.1 Neither Party shall have any liability under or be deemed to be in breach of the Agreement for any delays or failures in performance of the Agreement which result from circumstances beyond the reasonable control of the Party affected. Each Party shall promptly notify the other Party in writing when such circumstances cause a delay or failure in performance and when they cease to do so. If such circumstances continue for a continuous period of more than two months, either Party may terminate the Agreement by written notice to the other Party.

## 16. Termination

- 16.1 The Customer may terminate the Agreement at any time by notice in writing to the Contractor to take effect on any date falling at least 1 month (or, if the Agreement is less than 3 months in duration, at least 10 Working Days) later than the date of service of the relevant notice.

- 16.2 Without prejudice to any other right or remedy it might have, the Customer may terminate the Agreement by written notice to the Contractor with immediate effect if the Contractor:
- 16.2.1 (without prejudice to clause 16.2.5), is in material breach of any obligation under the Agreement which is not capable of remedy;
  - 16.2.2 repeatedly breaches any of the terms and conditions of the Agreement in such a manner as to reasonably justify the opinion that its conduct is inconsistent with it having the intention or ability to give effect to the terms and conditions of the Agreement;
  - 16.2.3 is in material breach of any obligation which is capable of remedy, and that breach is not remedied within 30 days of the Contractor receiving notice specifying the breach and requiring it to be remedied;
  - 16.2.4 undergoes a change of control within the meaning of section 416 of the Income and Corporation Taxes Act 1988;
  - 16.2.5 breaches any of the provisions of clauses 7.2, 11, 12, 13 and 17;
  - 16.2.6 becomes insolvent, or if an order is made or a resolution is passed for the winding up of the Contractor (other than voluntarily for the purpose of solvent amalgamation or reconstruction), or if an administrator or administrative receiver is appointed in respect of the whole or any part of the Contractor's assets or business, or if the Contractor makes any composition with its creditors or takes or suffers any similar or analogous action (to any of the actions detailed in this clause 16.2.6) in consequence of debt in any jurisdiction; or
  - 16.2.7 fails to comply with legal obligations in the fields of environmental, social or labour law.
- 16.3 The Contractor shall notify the Customer as soon as practicable of any change of control as referred to in clause 16.2.4 or any potential such change of control.
- 16.4 The Contractor may terminate the Agreement by written notice to the Customer if the Customer has not paid any undisputed amounts within 90 days of them falling due.
- 16.5 Termination or expiry of the Agreement shall be without prejudice to the rights of either Party accrued prior to termination or expiry and shall not affect the continuing rights of the Parties under this clause and clauses 2, 3.2, 6.1, 6.2, 6.6, 6.7, 7, 9, 10.2, 11, 12, 13, 14, 16.6, 17.4, 18.3, 19 and 20.7 or any other provision of the Agreement that either expressly or by implication has effect after termination.
- 16.6 Upon termination or expiry of the Agreement, the Contractor shall:

- 16.6.1 give all reasonable assistance to the Customer and any incoming Contractor of the Services; and
- 16.6.2 return all requested documents, information and data to the Customer as soon as reasonably practicable.

## 17. Compliance

- 17.1 The Contractor shall promptly notify the Customer of any health and safety hazards which may arise in connection with the performance of its obligations under the Agreement. The Customer shall promptly notify the Contractor of any health and safety hazards which may exist or arise at the Customer's premises and which may affect the Contractor in the performance of its obligations under the Agreement.
- 17.2 The Contractor shall:
  - 17.2.1 comply with all the Customer's health and safety measures while on the Customer's premises; and
  - 17.2.2 notify the Customer immediately in the event of any incident occurring in the performance of its obligations under the Agreement on the Customer's premises where that incident causes any personal injury or damage to property which could give rise to personal injury.
- 17.3 The Contractor shall:
  - 17.3.1 perform its obligations under the Agreement in accordance with all applicable equality Law and the Customer's equality and diversity policy as provided to the Contractor from time to time; and
  - 17.3.2 take all reasonable steps to secure the observance of clause 17.3.1 by all Staff.
- 17.4 The Contractor shall supply the Services in accordance with the Customer's environmental policy as provided to the Contractor from time to time.
- 17.5 The Contractor shall comply with, and shall ensure that its Staff shall comply with, the provisions of:
  - 17.5.1 the Official Secrets Acts 1911 to 1989; and
  - 17.5.2 section 182 of the Finance Act 1989.

## 18. Prevention of Fraud and Corruption

- 18.1 The Contractor shall not offer, give, or agree to give anything, to any person an inducement or reward for doing, refraining from doing, or for having done or refrained from doing, any act in relation to the obtaining or execution of the Agreement or for showing or refraining from showing favour or disfavour to any person in relation to the Agreement.
- 18.2 The Contractor shall take all reasonable steps, in accordance with good industry practice, to prevent fraud by the Staff and the Contractor (including its shareholders, members and directors) in connection with the Agreement and shall notify the Customer immediately if it has reason to suspect that any fraud has occurred or is occurring or is likely to occur.
- 18.3 If the Contractor or the Staff engages in conduct prohibited by clause 18.1 or commits fraud in relation to the Agreement or any other contract with the Crown (including the Customer) the Customer may:
- 18.3.1 terminate the Agreement and recover from the Contractor the amount of any loss suffered by the Customer resulting from the termination, including the cost reasonably incurred by the Customer of making other arrangements for the supply of the Services and any additional expenditure incurred by the Customer throughout the remainder of the Agreement; or
- 18.3.2 recover in full from the Contractor any other loss sustained by the Customer in consequence of any breach of this clause.

## 19. Dispute Resolution

- 19.1 The Parties shall attempt in good faith to negotiate a settlement to any dispute between them arising out of or in connection with the Agreement and such efforts shall involve the escalation of the dispute to an appropriately senior representative of each Party.
- 19.2 If the dispute cannot be resolved by the Parties within one month of being escalated as referred to in clause 19.1, the dispute may by agreement between the Parties be referred to a neutral adviser or mediator (the "Mediator") chosen by agreement between the Parties. All negotiations connected with the dispute shall be conducted in confidence and without prejudice to the rights of the Parties in any further proceedings.
- 19.3 If the Parties fail to appoint a Mediator within one month, or fail to enter into a written agreement resolving the dispute within one month of the Mediator being appointed, either Party may exercise any remedy it has under applicable law.

## 20. General

- 20.1 Each of the Parties represents and warrants to the other that it has full capacity and authority, and all necessary consents, licences and permissions to enter into and perform its obligations under the Agreement, and that the Agreement is executed by its duly authorised representative.
- 20.2 A person who is not a party to the Agreement shall have no right to enforce any of its provisions which, expressly or by implication, confer a benefit on him, without the prior written agreement of the Parties.
- 20.3 The Agreement cannot be varied except in writing signed by a duly authorised representative of both the Parties.
- 20.4 The Agreement contains the whole agreement between the Parties and supersedes and replaces any prior written or oral agreements, representations or understandings between them. The Parties confirm that they have not entered into the Agreement on the basis of any representation that is not expressly incorporated into the Agreement. Nothing in this clause shall exclude liability for fraud or fraudulent misrepresentation.
- 20.5 Any waiver or relaxation either partly, or wholly of any of the terms and conditions of the Agreement shall be valid only if it is communicated to the other Party in writing and expressly stated to be a waiver. A waiver of any right or remedy arising from a breach of contract shall not constitute a waiver of any right or remedy arising from any other breach of the Agreement.
- 20.6 The Agreement shall not constitute or imply any partnership, joint venture, agency, fiduciary relationship or other relationship between the Parties other than the contractual relationship expressly provided for in the Agreement. Neither Party shall have, nor represent that it has, any authority to make any commitments on the other Party's behalf.
- 20.7 Except as otherwise expressly provided by the Agreement, all remedies available to either Party for breach of the Agreement (whether under the Agreement, statute or common law) are cumulative and may be exercised concurrently or separately, and the exercise of one remedy shall not be deemed an election of such remedy to the exclusion of other remedies.
- 20.8 If any provision of the Agreement is prohibited by law or judged by a court to be unlawful, void or unenforceable, the provision shall, to the extent required, be severed from the Agreement and rendered ineffective as far as possible without modifying the remaining provisions of the Agreement, and shall not in any way affect any other circumstances of or the validity or enforcement of the Agreement.

## 21. Notices

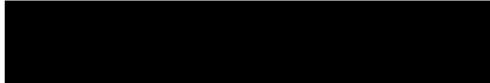
- 21.1 Any notice to be given under the Agreement shall be in writing and may be served by personal delivery, first class recorded or, subject to clause 21.3, e-mail to the address of the relevant Party set out in the Award Letter, or such other address as that Party may from time to time notify to the other Party in accordance with this clause:
- 21.2 Notices served as above shall be deemed served on the Working Day of delivery provided delivery is before 5.00pm on a Working Day. Otherwise delivery shall be deemed to occur on the next Working Day. An email shall be deemed delivered when sent unless an error message is received.
- 21.3 Notices under clauses 15 (Force Majeure) and 16 (Termination) may be served by email only if the original notice is then sent to the recipient by personal delivery or recorded delivery in the manner set out in clause 21.1.

## 22. Governing Law and Jurisdiction

- 22.1 The validity, construction and performance of the Agreement, and all contractual and non contractual matters arising out of it, shall be governed by English law and shall be subject to the exclusive jurisdiction of the English courts to which the Parties submit.

# SCHEDULE 1 - PROCESSING, PERSONAL DATA AND DATA SUBJECTS

1. This Schedule shall be completed by the Customer, who may take account of the view of the Contractor, however the final decision as to the content of this Schedule shall be with the Customer at its absolute discretion.
2. The contact details of the Customer Data Protection Officer are:  

3. The contact details of the Contractor Data Protection Officer are:  

4. The Contractor shall comply with any further written instructions with respect to processing by the Customer.
5. Any such further instructions shall be incorporated into this Schedule.

Data Processing descriptor	Narrative
Identity of the Controller and Processor	<i>N/A -This contract does not require the processing of personal data.</i>
Subject matter of the processing	<i>The requirement is for the utilisation of appropriate molecular biology techniques to create a database of alleles that can distinguish between approved varieties of Basmati rice (Oryza sativa L) that are permitted to be traded within the EU under the description 'Basmati' and non-approved varieties and potential adulterants.</i>
Duration of the processing	<i>N/A -This contract does not require the processing of personal data.</i>
Nature and purposes of the processing	<i>N/A -This contract does not require the processing of personal data.</i>

Type of Personal Data	<i>N/A -This contract does not require the processing of personal data.</i>
Categories of Data Subject	<i>N/A -This contract does not require the processing of personal data.</i>
Plan for return and destruction of the data once the processing is complete  UNLESS requirement under union or member state law to preserve that type of data	<i>Plan for personal data N/A for this contract.</i>  <i>For all other data, as per clause 16.6.2: return all requested documents, information and data to the Customer as soon as reasonably practicable.</i>

# SCHEDULE 2 – SPECIFICATION

## 1. Introduction

- 1.1 Defra's Food Authenticity Programme develops fit for purpose analytical testing methods to detect food fraud and labelling misdescription to support the enforcement of food standards law. The programme underpins Defra's commitment to improving consumer confidence in food labelling and ensuring a resilient food supply chain. In order to develop flexible and effective analytical tools to detect food misdescription, the programme invests in cutting-edge scientific molecular approaches such as 'omics' and DNA technologies to detect food fraud.

Basmati rice imported and sold in the UK is subject to a number of EU and UK regulations which require that food is accurately described and presented so as not to mislead the consumer. Basmati rice commands premium market prices and certain varieties of Basmati rice are eligible for zero import duty under EU law, which creates a risk that unscrupulous food business operators will adulterate or substitute Basmati rice with cheaper varieties for economic gain. Research is now required to develop a new database of alleles to provide authentic markers that can distinguish between approved Basmati rice varieties (including those eligible for zero import duty) and non-approved varieties and possible adulterants.

## 2. Aims

- 2.1 The requirement is for the utilisation of appropriate molecular biology techniques to create a database of alleles that can distinguish between approved varieties of Basmati rice (*Oryza sativa L*) that are permitted to be traded within the EU under the description 'Basmati' and non-approved varieties and potential adulterants. The project shall identify an appropriate set of DNA markers that could subsequently be used in an authentication test for variety.

## 3. Background

- 3.1 Defra's vision is for a world-leading food and drink industry that is competitive, resilient, trusted by the consumer with a strong reputation for the highest standards of food safety and quality<sup>[1]</sup>. Incidents of food and drink mislabelling and fraud can be damaging to public trust in the integrity of the food chain and impact on the competitiveness and resilience of UK businesses. The development of robust analytical tools to help verify product labelling and support food law enforcement is fundamental to improving confidence in food labelling for consumers, businesses and the food industry as a whole.
- 3.2 Defra's food authenticity research programme develops cutting edge technology to detect food fraud and help enforcers verify compliance with food labelling law to ensure the authenticity and integrity of the UK's food supply. Work under the programme specifically addresses one of Defra's high-level research challenges: 'how can Defra support more effective labelling, ensure better detection and combat fraud to ensure consumer confidence in food?'<sup>[2]</sup>. It also aims to deliver on Defra's commitments from the Elliott review regarding standardising testing approaches and analytical laboratory capability in the UK<sup>[3]</sup>

3.3 “Basmati” is the customary name for certain varieties of rice that are grown in specific areas of the Indo Gagentic Plains. India and Pakistan have agreed to protect the geographic indication of Basmati rice varieties covered by European Commission Regulation (EC) 972/2006, as detailed in Council Decisions 2004/617/EC and 2004/618/EC. Rice is approved as Basmati on the basis of having unique properties as measured by various objective criteria, such as grain dimension, amylose content, cooking elongation and aroma <sup>[4]</sup>. The 2017 *Code of Practice on Basmati Rice* lists the 40 varieties of Basmati officially approved by the Indian and Pakistani authorities; research is now required to develop a new database of alleles which will enable enforcement authorities to distinguish between approved varieties of Basmati rice and non-approved varieties and potential adulterants.

3.3 Food fraud is constantly changing, driven by the economic climate, availability of raw materials and ingredients and regulatory developments. EU law lays down provisions for the import at zero duty of certain approved varieties of Basmati rice produced in India and Pakistan. This, coupled with the fact that Basmati commands premium retail prices creates a foreseeable risk of unscrupulous food business operators adulterating or substituting Basmati rice with cheaper varieties. In 2004, an FSA survey examined different brands of rice labelled as ‘Basmati’ in order to provide information on the non-Basmati rice content. From the 363 samples collected from retailers and caterers across the country, 17% of samples had a non-Basmati rice content greater than 20% and 9% of samples had a non-Basmati content greater than 60% <sup>[5]</sup>.

In order to protect consumers from food fraud, the need for research to be able to identify varieties of Basmati rice and distinguish them from non-Basmati varieties is a priority. This is following concerns that have been raised about the increased number of varieties of Basmati rice on and/or entering the market. There is a need to make use of the latest innovative technology which builds on the existing science base to develop flexible and effective analytical tools that will enable us to respond to future food fraud incidents.

3.4 The current gold standard methodology for authentication and quantification of rice samples is based on the analysis of simple sequence repeats (SSR/microsatellite analysis). There are two methods currently available which both use capillary electrophoresis, with either a multi-capillary array where the PCR products are labelled with fluorescent dyes to aid analysis, or by using the lab-on-a-chip format of the Agilent BioAnalyser. These methods have been in use for a number of years for both commercial samples and surveillance purposes and whilst these methods can be used to detect adulteration in Basmati samples which contain one predominant variety, these methods also have significant limitations such as the inability to distinguish between certain eligible and non-eligible varieties. There is a need to explore alternative molecular biological techniques which can overcome the limitations of current microsatellite analyses.

3.6 The creation of a database of alleles for approved Basmati rice varieties (in addition to non-approved varieties and possible adulterants) will enable the subsequent development and validation of an authenticity test that could be used by enforcement and commercial laboratories across the country.

#### **4. Key Objectives**

#### 4.1 Objective 1 – Database development

4.1.1 The Contractor shall utilise appropriate molecular biology techniques (such as single step PCR approaches) to develop a database of alleles that can distinguish between the following types of rice grain samples:

- 1) Approved Basmati varieties that are eligible for zero import duty in EU
- 2) Other approved Basmati varieties not eligible for zero import duty
- 3) A minimum of 10 (ten) non-approved varieties and potential adulterants.

To achieve this, the Contractor shall identify and use an appropriate number of biological assays to genotype the 40 Basmati varieties (in addition to genotyping a selection of non-approved varieties and potential adulterants which are representative of the type of adulteration which takes place in the real world). The Contractor shall refer to Table 1 of the *Code of Practice on Basmati Rice* (Rice Association, 2017), which provides an up to date list of currently approved varieties.

<http://www.riceassociation.org.uk/content/1/47/2017-basmati-code-of-practice.html> . A copy of this table is included in Annex 4 of this specification.

4.1.2 The Contractor has confirmed that the The Rice Association were not able to source the accession of 'Basmati 217' from the Indian and Pakistani Authorities and so it is assumed that it is no longer grown by farmers and used in the rice industry. However, it is still on the list of varieties and has been included as a standard. See Contractor clarification at annexe 5. The Contractor shall inform Defra of any additional cost in relation to the Basmati 217 test should it be feasible for the test to be undertaken.

4.1.3 This objective shall cover the optimisation of sample preparation, including quality control; bioinformatics analysis and the identification and evaluation of an appropriate set of genetic markers that could be used in future to develop a validated Basmati authenticity test. This objective shall also evaluate their suitability to distinguish new varieties and distinguish them from non-Basmati varieties. The contractor shall demonstrate whether the developed database is fit for purpose to support future method development. The contractor may be required to engage with Defra's authenticity expert group (Authenticity Methods Working group) to present progress.

4.1.4 The Contractor shall ensure that particular care is given to sourcing and preparation of authentic reference samples; the Contractor will need to demonstrate that they are able to procure all varieties of the latest approved Basmati rice varieties and demonstrate their authenticity.

#### 4.2 Objective 2 – Work plan

4.2.1 Building on objective 1, the contractor shall produce a work plan for the development and validation of a Basmati authentication test which is capable of being used by official control laboratories. The work plan will subsequently be reviewed by Defra's expert Authenticity Methods Working Group (AMWG).

4.3 The Contractors response outlining how the contractor will delivery these objectives is included in Annex 4 of the contract.

## 5. Project Outputs

5.1 The Contractor shall deliver the following outputs:

5.1.1 A draft report on an EVID 4 template which must contain a database of alleles (in excel format) for the approved varieties of Basmati rice analysed (and for a selection of non-approved varieties and potential adulterants to be agreed with the authority). The report must describe the project work, how the aims and objectives have been met and any supporting evidence. The report shall contain an executive summary, explanation of the database development process, including information on the bioinformatics analysis undertaken. The executive summary shall be a two page summary of the main findings and recommendations and shall refrain from simply bulleting the points in the main report, but shall take a wider look at what the findings mean in the policy context. The draft report will include a suggested work plan for the development and validation of a Basmati authentication test to be used principally by official control laboratories in the UK.

5.1.2 At project meetings the contractor shall provide Defra with project updates, summaries of emerging findings, supported by the data developed under the project and evidence of the quality assurance activities undertaken.

## 6. Timeline

### 6.1 Table 1. Timetable of Deliverables

Milestone Description	Delivery Date

6.2 Defra shall have the option to extend the Contract to incorporate the development and validation of a Basmati authenticity test based on the Company's proposals developed as part of objective 2 (see section 4.2.1 of this Specification of Requirements). This will be subject to budget availability and at the discretion of Defra.

## **7. Performance Management Framework and Key Performance Indicators**

- 7.1 Key Performance Indicators (KPIs) are essential in order to align the Company's performance with the requirements of Defra and to do so in a fair and practical way. KPIs have to be realistic, measurable and achievable; they also have to be met otherwise indicating that the service is failing to deliver. Without the use of service credits in such a situation, this service failure places strain on the relationship as delivery falls short of agreed levels.
- 7.2 The proactive approach to correcting failures and addressing their cause improves the relationship and enables a partnership rather than a confrontational style of working. Its focus is on managing and improving the Service.
- 7.3 The proposed KPIs for this contract are set out at Annex 1.

## **8. Governance and Contract Management**

- 8.1 On commencement of the Contract the Contractor shall attend an inception meeting. Thereafter the Contractor shall participate in monthly review meetings with Defra. Progress against milestones and the quality of the work delivered and the Company's performance shall be discussed as part of these meetings. The Contractor will be appropriately represented at the review meeting, which will usually be conducted via teleconference or held face to face and combined with the project meetings set out in Clause 6.1 – *"Table 1 – Timetable of Deliverables"*.
- 8.2 The Contractor shall appoint a nominated person of appropriate grade to be the Contractor's Authorised Representative to manage the project and to liaise with Defra as required. At any meeting, the Contractor's Authorised Representative will be authorised to make critical decisions.
- 8.3 The Contractor shall be supervised by an official from Defra who will act as nominated officer for the project.
- 8.4 Defra will be responsible for agreeing dates and drafting the agenda for and producing a note of the review meeting.
- 8.5 The Contractor shall maintain their own management reports, including a risk and issues log and present these as requested by Defra at any meeting requested by Defra.

## **9. Service Credit Principles**

- 9.1 Service credits sit within the wider service management approach being pursued by the Company and Defra.
- 9.2 The service credit regime shall be instigated on each occasion where there is a service failure (i.e. where it is recognised by Defra that the standards have fallen below the minimum). This will also give rise to an improvement plan (Remediation Plan) which the Company will use to demonstrate how all issues highlighted will be addressed within a week of Defra's request.

- 9.3 Service credits will be applied as follows (with reference to the KPI's outlined in Annex1).
- 9.3.1 KPI 1 – Unless there is clearance from Defra, 2 consecutive failures to meet KPI 1 will result in a deduction in payment of 5% of the subsequent invoice.
- 9.3.2 KPI 2 – Unless there is clearance from Defra, failure to meet KPI 2 will result in a deduction in payment of 10% of the relevant milestone payment, for each milestone for which the failure applies.
- 9.3.3 KPI 3 – Unless there is clearance from Defra, failure to meet KPI 3 will result in a deduction in payment of 10% of the annual price for that reporting period.
- 9.4 Defra has full and complete discretion on whether to claim all, part or none of a service credit to which it is due.
- 9.5 Service Credits will not apply if a KPI is triggered due to circumstances outside the Company's reasonable control. The test of reasonableness will be at Defra's discretion but Defra will consult the Company to determine the circumstances of the breach.
- 9.6 The use of Service Credits does not prejudice Defra's rights under the appropriate clauses of the Contract in the event of inadequate performance by the Company.
- 9.7 The full, agreed service credit regime shall operate from the Contract start date until the end of the Contract.

## 10. References

- 10.1 The references used throughout this Specification of Requirements are provided below:
1. Defra (Department for Environment, Food and Rural Affairs). 2016. Defra's Strategy to 2020. Available from:  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/501709/defra-strategy-160219.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501709/defra-strategy-160219.pdf) (accessed May 2018)
  2. Defra (Department for Environment, Food and Rural Affairs). 2017. Defra group areas of research interest. Available from:  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/603116/defra-areas-of-research-interest-170322.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/603116/defra-areas-of-research-interest-170322.pdf) (accessed May 2018)
  3. Elliot Review. 2014. Available from:  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/350726/elliott-review-final-report-july2014.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/350726/elliott-review-final-report-july2014.pdf) (accessed May 2018)
  4. Rice Association, 2017. Code of Practice on Basmati Rice. Available from:  
<http://www.riceassociation.org.uk/content/1/47/2017-basmati-code-of-practice.html> (accessed May 2018)
  5. Food Standards Agency Basmati Rice Survey. 2004. Available from  
<http://www.food.gov.uk/multimedia/pdfs/fsis4704basmati.pdf> . (accessed May 2018)

## SCHEDULE 3 – PAYMENT SCHEDULE

1. The Customer will pay to the Contractor no more than the fixed sum of:  
£24,659 (exclusive of VAT)
2. Payment will be made in line with Table 2 – Payment Schedule
3. Subject to any variation of the Agreement, the amounts in paragraph 1, above, shall remain firm throughout the duration of the Agreement.
4. In the event that the Agreement is varied, the amount in paragraph 1 shall be adjusted by such reasonable sum as may be agreed, in writing, between the Customer and the Contractor.
5. All travel and subsistence costs shall be in line with Defra’s Travel and Subsistence Policy, (provided at Annex 2) and claimed on an actuals basis. Claims should always be supported by valid receipts for audit purposes and must not exceed any of the stated rates below. Should the stated rates be exceeded, Defra reserves the right to reimburse only up to the stated rate.
6. Payment shall only be made on completion of milestones, as accepted and signed off by Defra’s Project Officer. No partial payments will be made and no other costs will be payable by Defra under this Contract.
7. The Contractor shall ensure that all invoices include the correct purchase order number (as provided by Defra), the contract number, Defra’s contact details, a qualitative description of the work being completed and shall clearly itemise all costs and link these to the milestones achieved and signed off.
8. The Contractor shall be responsible for submitted invoices within ten (10) Working Days of Defra’s Project Officer confirming completion of a milestone.

**Table 2 – Payment Schedule**

Milestone Description	Payment Amount	Delivery Date	Payment Date
<b>Total</b>	<b>£24,659.00</b>		

## Annex 1 Key Performance Indicators

Metric	KPI  (if any of the deliverables are deemed not to meet the Minimum Standard the over-arching KPI itself will be 'failed')	What is required to make this measurable	KPI Measurement	Minimum Standard  (KPI Failure)	Acceptable Standard
Contract Management	<b>KPI 1: Monthly Invoices</b>	Invoices produced within ten (10) working days of Defra confirming the Company's achievement of a milestone	<p>Defra will review all invoices submitted by the Company to check that the following information is included and is correct:</p> <ul style="list-style-type: none"> <li>• Purchase order number</li> <li>• Defra contact details</li> <li>• Contract number</li> <li>• Qualitative description of the work completed</li> <li>• Clearly itemise all costs and link these to the milestones achieved and signed off</li> </ul>	Invoices sent to Defra which contain inaccuracies and/or greater than ten (10) working days after the agreed deadline	Meets expectations – all invoices sent to Defra on time and accurately reflect agreed work
Delivery	<b>KPI 2: Project Management</b>	Milestones achieved by the dates specified in the Specification of Requirements	Defra will review the Company's progress against the milestones and confirm whether the milestones have been achieved in line with the dates specified	Milestones not achieved by the deadline	Milestones achieved by the deadline
Quality	<b>KPI 3: Research Quality</b>	Reports show that the research analysis undertaken has been rigorous, relevant and meets the Key Objectives set out in section 5 of the Specification of Requirements	Defra will assess the quality and completeness of the reports against the Key Objectives set out in section 5 of the Specification of Requirements	Reports are of a poor quality and/or contain errors and/or do not achieve all of the Key Objectives	Reports are of a high quality, error free and achieve all of the Key Objectives

## Annex 2 Travel and Subsistence Policy

### Travel and Subsistence

All Travel and Subsistence should be in line with Defra's Travel and Subsistence Policy. Claims should always be supported by valid receipts for audit purposes and must not exceed any of the stated rates below. Should the stated rate be exceeded, Defra reserve the right to reimburse only up to the stated rate.

### Rail Travel

**All Journeys** – Standard class rail unless a clear business case demonstrating value for money can be presented. This includes international rail journeys by Eurostar and other international and overseas rail operators.

### Mileage Allowance

Mileage Allowance	First 10,000 business miles in the tax year	Each business mile over 10,000 in the tax year
Private cars and vans – no public transport rate*	45p	25p
Private cars and vans – public transport rate	25p	25p
Private motor cycles	24p	24p
Passenger supplement	5p	5p
Equipment supplement**	3p	3p
Bicycle	20p	20p

\*NB the 'no public transport rate' for car and van travel can only be claimed where the use of a private vehicle for the journey is essential e.g. on grounds of disability or where there is no practical public transport alternative. If the use of the vehicle is not essential the 'public transport rate' should be claimed.

\*\* Under HMRC rules this expense is taxable.

### UK Subsistence

Location	Rate
London (Bed and Breakfast)	£115
UK Other (Bed and Breakfast)	£75

### Annex 3

#### Varieties of Basmati Rice that can use the description 'Basmati' (Rice Association, 2017)

<b>Basmati rice varieties eligible for a zero import duty under Commission</b>	
Basmati 217*	Ranbir Basmati (IET 11348)
Basmati 370	Super Basmati
Basmati 386	Taraori Basmati (HBC-19, Karnal Local)
Kernel Basmati (Basmati Pakistan)	Type – 3 (Dehradun)
Pusa Basmati 1(IET 10364)	

<b>Basmati rice varieties eligible for a zero import duty under Commission</b>	
Basmati 198	Kasturi (IET 8580)
Basmati 385	Mahi Suganda
Haryana Basmati (HKR 228/IET 10367)	Chenab Basmati
Kissan Basmati	Shaheen basmati
Basmati 2000	Pusa Basmati 6 (Pusa 1401)
Pusa Basmati 1509	Punjab Basmati 3
Improved Pusa Basmati 1 (Pusa 1460)	Pusa Basmati 1637
Vallabh Basmati 22	Vallabh Basmati 24
Punjab Basmati 2	Pant Basmati 1
Punjab Basmati (Bauni Basmati)	Noor Basmati
NIAB Basmati 2016	Pusa Basmati 1121
Yamini (Basmati CSR 30)	Basmati 515
Pusa Basmati 1609	Pusa Basmati 1728
Malviya Basmati Dhan 10-9	Basmati 564
Vallabh Basmati 21	Vallabh Basmati 23
Pant Basmati 2	

NB: not all of these varieties are commercially available, but are included because they are officially approved in India or Pakistan.

\*See clause 4.1.2.

## Annex 4

### Tender Response from Bangor University

#### Quotation for Identification of Biological Assays to Authenticate Basmati Rice Varieties

##### I. Where and how are you intending to source your reference materials?

The reference materials will be sourced from the collection held at Bangor University. These have been kept stored at 4°C since receipt.

##### Reference materials of Approved Basmati Varieties: 39 available

In October 2017 Bangor received 33 Basmati reference samples provided to the Rice Association [REDACTED]. These reference samples equate to 25 supplied by India and 8 supplied by Pakistan, giving a total of 33 samples out of the list of 41 given in Annex 5 (page 15) of this Request for Quotation document. Bangor University also holds reference materials for 6 of the remaining varieties that were supplied to Bangor from verified sources in India and Pakistan, via the Food Standards Agency, between 2003 and 2011. These sources are summarised in Table 1. and in the scanned lists at the end of this document that accompanied the 2017 shipments from India and Pakistan.

We note that Punjab Basmati 2 appears on the list twice but only one a sample of this variety was received from India. From Pakistan one sample labelled Pujab Basmati was received and we have aligned this reference sample to Pujab Basmati (Bauni Basmati) listed in Annex 5, although confirmation from the Pakistan Authorities will be sought on its true designation. We also note that no sample of Basmati 217 is currently available, this is likely to be due to it being a very old variety that is no longer grown (again confirmation from India and Pakistan authorities will to be sought during this project).

**Table 1.** Source of reference materials for Varieties of Basmati Rice listed in Annex 5.

Samples listed in Annex 5	Number	Notes
Rice Association from Pakistan 2017	8	See list from Pakistan
Rice Association from India 2017	25	See list from India
Reference materials pre 2011 at Bangor	6	Kernal, Super, Type-3, Basmati 198, Basmati 385, Mahi Suganda
Not available	2	Basmati 217 and second sample of Punjab Basmati 2
Total	41	

### Reference materials of Non-approved Varieties

We have identified 20 samples (Table 2) that are available in Bangor's collection that will be informative about potential adulterant alleles and these are proposed to be used. The final selection of non-approved samples will be agreed with Defra before commencing with the genotyping work.

### **II. How many reference materials are you intending to collect?**

In total 60 reference materials that have already been collected will be used for this work. Given the timeframe it may not be possible to source any further samples, however the options for this can be explored in discussions with Defra and the Rice Association.

### **III. How will you demonstrate their provenance and authenticity?**

Relevant documentation and records maintained at Bangor regarding the acquisition of standards will be made available to Defra.

### **IV. Have you consulted with relevant stakeholders in the food industry, food manufacturers, trade associations etc - to ensure your authentic samples and any simulated adulterated samples reflect industry knowledge of the authenticity issues being addressed in your project proposal? If so, please provide details?**

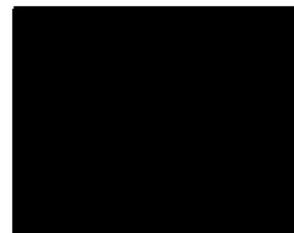
Yes, [REDACTED] has a good working relationship with the Rice Association who consulted with the Industry in Pakistan and India to provide the standards in 2017. [REDACTED] also has longstanding links with rice breeders and industry India and Pakistan, and with the Food Standards Agency. [REDACTED] currently is working on an Innovate UK Industrial project (Ref. 103711) which includes Basmati rice breeders at SKUAST in Kashmir, India (SKUAST) and at NIBGE in Pakistan and is aware of their current breeding priorities and targets for marker-assisted selection for future improved lines. We will continue to work closely with the Rice Association and through them their contacts in the Pakistan and India authorities to resolve queries (noted above and any others that arise during the project) about current status of varieties.

**Table 2.** Non-approved reference materials available in Bangor

<b>Number</b>	<b>Variety</b>	<b>Origin</b>
1	Sierra RU9203126 American Basmati type S68	Nottingham University
2	Basmati C22 Peshwari S-99.3	Nottingham University
3	Basmati_1 S-105.1 (147)	Nottingham University
4	IR6 S36	University of Faisalabad, Pakistan
5	KS282 S37	University of Faisalabad, Pakistan
6	Mugad Sugandha S24	Birsa Agricultural University, Ranchi, India
7	Niab/221-9 S35	University of Faisalabad, Pakistan
8	Pak386 S75	Grain Tech, Pakistan
9	Pusa Suganda 2 S87	United Riceland, India
10	Pusa Suganda S64	United Riceland, India
11	Pusa Sugandha 2009 Tilda	United Riceland, India
12	Shaheen S72	FSA
13	Sherbati awns S86	United Riceland, India
14	Sherbati S49	Grain Tech, Pakistan
15	Sherbati short S85	United Riceland, India
16	Sugandha S97	FSA
17	Super Shabnam S95	FSA
18	Superfine S77	Grain Tech, Pakistan
19	BR1 (Super Basmati 101; BLB1)	NIBGE, Pakistan
20	W005 B296 S2	Unidentified variety from commercial sample

CHARACTERISTICS OF APPROVED BASMATI RICE VARIETIES FROM PAKISTAN

S.No	Name of Variety	Length	Width	Thickness	Amylose (%)	Gel length (mm)	Alkali spread value	Elongation Ratio	Aroma
1.	Bas. 2000	7.68	1.73	1.64	23.2	77.0	5.0	1.93	Present
2.	Shaheen Basmati	7.35	1.67	1.54	24.0	65.0	4.7	1.92	Present
3.	Basmati 515	7.55	1.64	1.58	24.2	67.0	4.6	2.01	Present
4.	Punjab Basmati	7.65	1.50	1.52	23.5	68.0	4.3	1.88	Present
5.	Chenab Basmati	7.60	1.54	1.53	24.0	65.0	4.5	1.85	Present
6.	Kissan Basmati	8.00	1.52	1.50	23.1	61.0	4.8	2.07	Present
7.	Noor Basmati	8.10	1.46	1.43	25.0	66.0	4.2	1.83	Present
8.	NIAB Basmati 2016	7.38	1.64	1.47	24.2	65.0	4.3	1.89	Present



INDIA

Box 1

Sl.no.	Variety	Remarks
1	Pusa Basmati 1509	✓
2	Pusa Basmati 1637	✓
3	Pusa Basmati 6	✓
4	Pusa basmati 1	✓
5	Pusa Basmati 1121	✓
6	Pusa Basmati 1728	✓
7	Pusa Basmati 1609	✓
8	Basmati 564	✓
9	Basmati 386	✓
10	Basmati CSR 30	✓
11	Basmati 370	✓

INDIA

Box 2

Sl.no.	Variety	Remarks
1	Ranbir basmati	✓
2	Kasturi	✓
3	Improved Pusa Basmati 1	✓
4	Malviya Basmati Dhan 10-9	✓
5	Taraori Basmati	✓
6	Haryana Basmati	✓
7	Pant Basmati 1	✓
8	Pant Basmati 2	✓
9	Punjab Basmati 2	✓
10	Punjab Basmati 3	✓
11	Vallabh Basmati 21	✓
12	Vallabh Basmati 22	✓
13	Vallabh Basmati 23	✓
14	Vallabh Basmati 24	✓

## **Quotation for Identification of Biological Assays to Authenticate Basmati Rice Varieties**

**EO2 With respect to DNA database development & route to implementation, please provide the following detail:**

All work will be carried out in accordance with the timeline and milestones in Annex 1 of the Request for Quotation.

### **I. How will you demonstrate that the developed database is fit for purpose to support future method development?**

The project will adhere to the specifications given in Annex 1 of the Request for Quotation and it will produce a database of alleles that can distinguish between approved varieties of Basmati rice (as defined therein) and non-approved varieties and potential adulterants. The database will consist of a minimum of 180 informative loci that reveal polymorphisms within the approved Basmati varieties and between the approved and non-approved rice varieties. This will be appropriate for subsequent method development since a set of between 20-50 informative loci is needed that can be developed in a KASP-based test. The combination of loci should, when assessed as a set, be able to unequivocally distinguish both within approved Basmatias and between them and any likely non-approved rice varieties that may be substituted or mixed into consignments.

KASP is a proprietary technology of LGC genomics and the primers can be purchased from LGC and used by researchers who have access to PCR machine and a fluorescence plate reader. This makes them ideally suited for use in a new test that could replace the current test that uses microsatellites for Basmati authentication (Report on The Collaborative Trial of the Microsatellite Method for the Identification of Certain Basmati Rice Varieties. Food Standard Agency Report October 2005). KASP can genotype at both SNP and InDel variants in DNA sequences, as can SeqSNP (<https://www.lgcgroup.com/services/genotyping/targeted-genotyping-by-sequencing-seqsnp/#.W8w5v62ITeQ>) which uses the same user defined sequences to select assays. SeqSNP has advantages over KASP for the initial genotyping for database development because it is extremely cost-effective and can increase the number of informative loci by over 1000 times (Table 3).

Our experimental design must be informed by the results from the SSR analysis of the approved Basmati rice samples obtained from India and Pakistan in 2017 that was carried out by Eurofins and supplied to the Rice Association and from the Rice Association to Bangor in confidence. This identified that although the majority of the Approved Basmati samples were pure, six may not be pure. Hence replication of these samples is recommended in this genotyping screen due to the existence of possible allelic variation within these samples. In order to keep within budget our design can use one replicate of each of the 33 pure samples and a minimum of two replicates for each of these six impure samples.

The list of non-approved varieties (EO1 Table 2) will be discussed with Defra at the outset. They include varieties known to have been previously used as adulterants. However, they may no longer be used given that the new set of approved varieties are the most likely recent adulterants (although this has not been tested). Since their approval it is possible that the practice of substituting non-approved varieties may have reduced, however there is still a chance that new more economic varieties may be being developed (such as Super Basmati 101 in Pakistan) that

could be substituted with any of the varieties on this list. Hence developing a test that uses known targets of breeding programmes would be prudent. A database of 225 alleles already exists for more than 30 IRRI, Nepalese, Indian and Pakistan rice varieties used for breeding in the Innovate UK Project. This data will be included during the analysis of alleles detected in this Basmati project to help inform selection of the most appropriate and reliable KASP assays for test development.

The genotyping will be contracted out to LGC. We are exploring two options for genotyping, either can begin as soon as possible after all DNA samples have been prepared from the agreed set of standards. It is expected that genotyping will start in early December 2018 and it will take 6 weeks for either method. Genotyping data will be provided to Bangor University. Data will be analysed to select the loci that give the most pairwise allelic differences to distinguish the greatest number of pairs (or groups) of samples. The database of all successful assays will be provided to Defra in the form of an Excel spreadsheet giving the alleles for each of the samples for all successful assays, and indicating the most appropriate for use in subsequent testing.

### 1. SeqSNP to genotype 72 DNA samples with 50,000 assays

**Pros:** 50,000 assays can be used to genotype 72 DNA samples for the same price as option 2. This is expected to give over 20,000 informative assays from which to select the most appropriate set for use in a KASP-based test. The 72 samples can include 60 approved Basmatris (of which 6 varieties can be tested in replicate) and 20 non-approved varieties

**Cons:** Because we are limited to using the Phytopure kits for DNA extraction from polished grains we may not get suitable high molecular weight. Therefore, the samples will be first QC-ed by LGC for suitability for SeqSNP, and if they are not all suitable, then the KASP method will be used (Option 2).

A set of 50,000 BED files will be provided by Bangor to LGC at the start of the project.

### 2. KASP genotyping of 60 DNA samples with 400 assays

**Pros:** KASP analysis has already been carried out successfully in a pilot study with DNA extracted using the Phytopure method from polished grains.

**Cons:** Fewer informative markers will be identified with KASP (180 expected), but this is enough polymorphic comparisons to develop a KASP-based test. The need for replication of 6 approved samples would restrict the number of non-approved varieties to 15 that could be included for KASP analysis with 400 assays.

The KASP loci to be used will include 225 successfully validated assays and 175 new assays. The loci selected have been designed to select regions targeted by breeders using marker-assisted selection including disease resistance and salinity tolerance – these have a high probability of differing in recently improved varieties from such breeding programmes. The set of loci also includes those associated with aroma on chromosome 8 and a number of minor aroma QTLs.

Our prior experience suggests a success rate of 90% which will give us data at 360 loci. Assuming 50% of assays will be polymorphic, this will give 180 informative loci (Table 3).

### Table 3

<b>Method</b>	<b>Total number of assays</b>	<b>% Successful assays</b>	<b>% Polymorphic assays</b>	<b>Expected total successful</b>	<b>Expected total polymorphic</b>
<b>KASP</b>	400	90	50	360	180
<b>SeqSNP</b>	50,000	90	50	45,000	22,500

**II. Assuming method development is feasible, how transferable do you think the method will be and / or what capacity does your facility have to conduct contract testing at the completion of this project?**

### **Workplan for the development and validation of a Basmati Authentication test**

#### **1. Development of Basmati variety authentication test**

This can be done by Bangor University and will require separate pricing. It will involve procurement (from LGC Genomics) of the KASP by Design Primer Mix (to run 2,500 x 10 ul reactions) for each of the KASP assays that we will test. The cost will be [REDACTED] LGC supply KASP mastermix in two sizes [REDACTED]

The total number of assays to test will be determined by the polymorphism patterns in the database produced. It may be that some approved Basmati Varieties may need to be identified as belonging to a group of varieties that all share a common genotype pattern, different from other groups and from all non-approved Basmatris. All of the potential test KASP assays will be tested on as wide a range of rice samples as possible in the agreed budget. Bangor University has a number of quantitative real time PCR machines (Quantstudio 6, Techne PrimePro, CFX Connect) and a plate readers so we can trial the test on a range of platforms that are commonly available in molecular laboratories.

The end of this work will be the production of a Standard Operating Procedure in conjunction with Defra and consultation with end-users. The final test will include the minimum optimum set of KASP assays that can be used to effectively distinguish approved varieties (or variety groups) and non-approved varieties. We anticipate that this will be between 20 – 50 markers, given the number of varieties that must be distinguished.

#### **2. Validation of Basmati variety authentication test through a ring trial with known varieties provided to participants**

Once the variety test SOP is in place a ring trial could be managed and led by Bangor University . It would be designed in agreement with Defra and other stakeholders. Bangor can supply standards and co-ordinate data analysis.

#### **3. Development of a quantitative test to identify different possible mixtures**

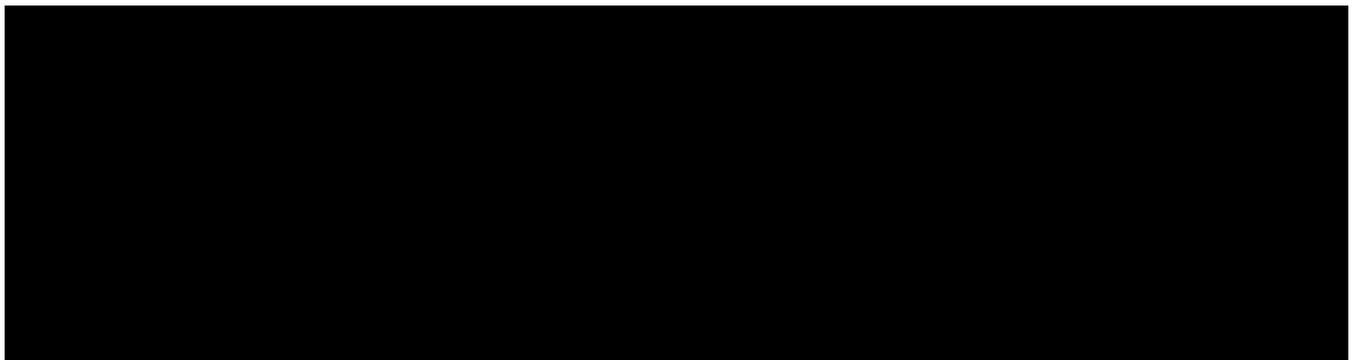
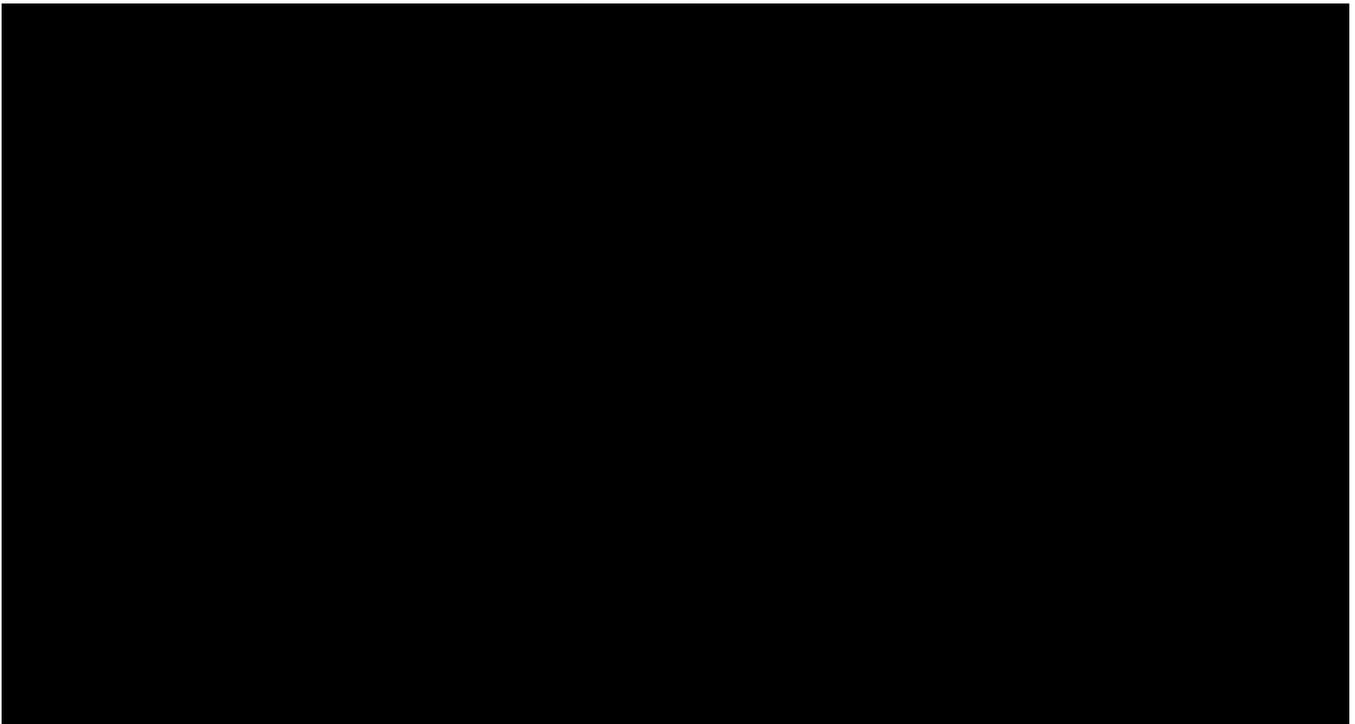
Individual assays from the variety test can be used to develop quantification based on quantitative PCR. This can involve Bangor University as a partner in collaboration with another partner with more experience in quantitative testing. Any quantitative tests should use markers that give appropriate pair-wise differentiation and the priorities for this will need to be agreed when selecting the assays. Standard curves will need to be prepared with the pairwise mixtures and Bangor can be involved in this.

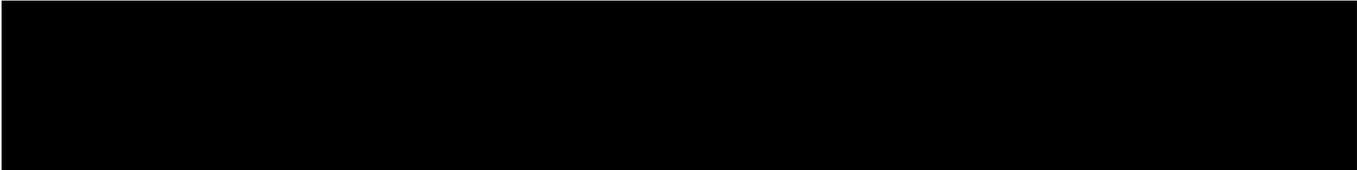
#### **4. Contract testing**

Bangor University's focus is research, developing impact from research and higher education. Therefore, although Bangor University has the capacity to do contract testing it is not a priority at present. However, the Bangor team will be able to provide training to end users, advice on trouble shooting and independent verification during the roll-out phase by other organisations (companies and public analysts) who can do contract testing on a commercial basis.

### **Quotation for Identification of Biological Assays to Authenticate Basmati Rice Varieties**

**I. Please provide information on the breadth of skills/expertise of the project team and how this will ensure successful delivery of project outcomes?**

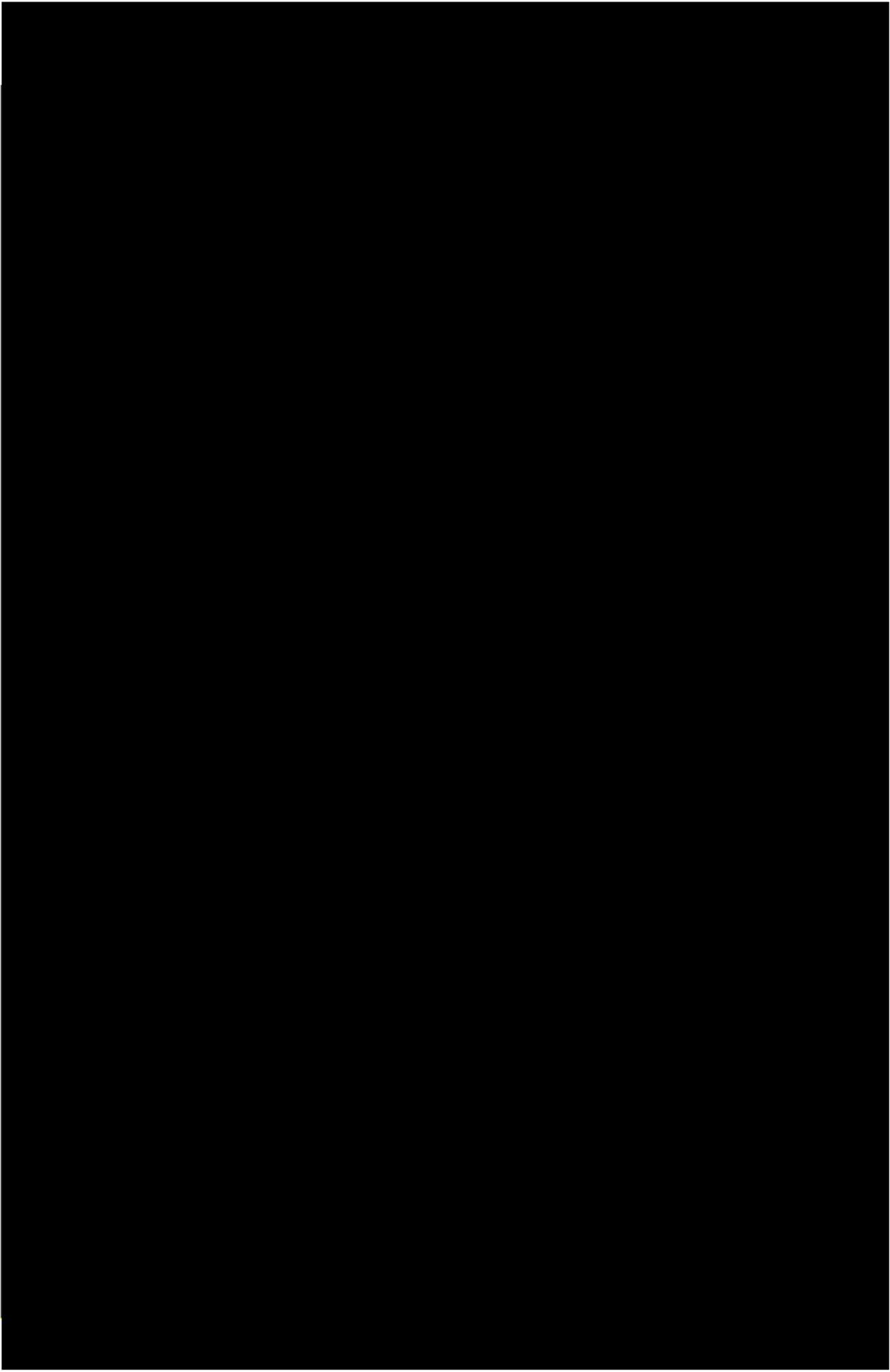




**II. Will the project work be completed in-house or will elements be contracted out?**

The sub-sampling of reference materials, DNA extraction, initial DNA quality control, and all final data analysis and report writing will be done in house at Bangor University.

The genotyping of SNP and InDel loci will be sub-contracted to the LGC Group. LGC will carry out QC to determine whether the DNA is of sufficient quality to proceed with SeqSNP (our preferred option) or whether only KASP genotyping (at their Hoddesdon site) is feasible. They will perform KASP as a service provider to test 400 KASP assays as detailed in the attached quote. If SeqSNP is feasible it will be done by LGC as an NGS service (at their Berlin site) with 50,000 SeqSNP assays and LGC have given us a cost for this as [REDACTED] per sample. Bangor University have been using both both KASP genotyping and NGS services since 2015.



## **Annex 5 Contractor Clarifications**

### **CQ2.**

**In relation to the unavailability of Basmati 217, please can you provide additional information on what further steps will be taken to source this variety and if sourced, the likely timescales for authenticating the samples via SSR (would this also be undertaken by Eurofins)?**

### **Response CQ2 (Bangor University)**

The Rice Association were not able to source this accession from the Indian and Pakistani Authorities and so we assume that it is no longer grown by farmers and used in the rice industry. But it is still on the list and therefore should be included as a standard. I have contacted the International Rice Gene bank at IRRI to see if they have any in stock (it is listed in their database). If IRRI can supply it we could have one or more accessions by early 2018. I have not costed for Eurofins (or Bangor) to test Basmati 217 accessions with SSRs in the Bangor budget, but this could be discussed with Eurofins and the Rice Association, who may be willing to pay for the test. It is possible that Eurofins might be willing to test it free of charge if they can add the result to their database and improved their current testing. The timescale would depend on Eurofins, but it is feasible that it could be done within the project timescale.