Conditions of Contract

Services

Version: October 2019

East Hampshire Chichester Chalk Groundwater Model Update

[redacted]

1. DEFINITIONS

1.1. In the Contract, unless the context otherwise requires the following words and expressions shall have the following meanings assigned to them.

1.1.1. Agency
The Environment Agency, its successors and assigns.

1.1.2. Agency Property
All property issued or made available for use by the Agency to the Contractor in connection with the Contract.

1.1.3. The Appendix
The Appendix to these Conditions.

1.1.4. The Contract
These Conditions including the Appendix, any Special Conditions, Specification, Pricing Schedule, Contractor's tender, acceptance letter and any relevant documents agreeing modifications exchanged before the Contract is awarded, and any subsequent amendments or variations agreed in writing.

1.1.5. The Contractor
The person, firm company or body who undertakes to supply the Services to the Agency as defined in the Contract.

1.1.6. Contract Period
The time period stated in the Appendix or otherwise provided in the Contract, for the performance of the Services.

1.1.7. Contractor Personnel
means all directors, officers, employees, agents, consultants and contractors of the Contractor and/or of any sub-contractor engaged in the performance of its obligations under this Contract

1.1.8. Contract Price
The price exclusive of VAT set out in the Contract for which the Contractor has agreed to supply the services.

1.1.9. Contract Supervisor
Any duly authorised representative of the Agency notified in writing to the Contractor for all purposes connected with the Contract. Any Notice or other written instruction given by or made to the Contract Supervisor, shall be taken as given by or made to the Agency.

1.1.10. Contracting Authority
means any contracting authorities (other than the Environment Agency) as defined in regulation 2 of the Public Contract Regulations 2015 (SI 2015/102) (as amended).

1.1.11. Data Protection Legislation

means: (i) the General Data Protection Regulation (Regulation (EU) 2016/679) or GDPR, the Law Enforcement Directive (Directive (EU) 2016/680) ("LED") and any applicable national implementing Laws as amended from time to time (ii) the Data Protection Act 1998 ("DPA 1998") and/or the Data Protection Act 2018 ("DPA 2018") to the extent that it relates to processing of personal data and privacy; (iii) all applicable Law about the processing of personal data and privacy

1.1.12. Data Protection Schedule
The Schedule attached to this Contract describing how the Parties will comply with the Data Protection Legislation.

1.1.13. Intellectual Property Rights
All Intellectual Property Rights including without limitation, patents, patent applications, design rights, registered designs, utility models, trade and service marks and applications for same, copyright know-how, rights in semi-conductor chip topography, and in each case whether protectable at law or not, and if protectable, whether an application has been made for such protection or not, and all similar industrial, commercial, monopoly or other intellectual property rights whether present or future, vested or contingent wherever protected.

1.1.14. Law
means any law, 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 with which the Contractor is bound to comply

1.1.15. Notice
Any written instruction or notice given to the Contractor by the Contract Supervisor, delivered by:

i. fax, or hand delivery to the Contractor’s registered office or other address notified for the purposes of the Contract and deemed to have been served at the date and time of delivery;

First class post to the Contractor’s registered office. Such Notices are deemed to have been served 48 hours after posting.

1.1.16.Results
All things produced in performing the Services including maps, plans, photographs, drawings, tapes, statistical data, experimental results, field data, analysis of results, published and unpublished results and reports, inventions, computer programmes and user documentation.

1.1.17.The Resulting Rights
All Intellectual Property Rights in the Results that are originated, conceived, written or made by the Contractor, whether alone or with others in the performance of the Services or otherwise resulting from the Contract.

1.1.18.Permission

Express permission given in writing before the act being permitted.

1.1.19.Services
All Services detailed in the Specification including any additions or substitutions as may be requested by the Contract Supervisor.

1.1.20.Regulations
Means the Public Contract Regulations 2015 (SI 2015/102) as amended.

1.2. Except as set out above and in the Data Protection Schedule, the Contract shall be interpreted in accordance with the Interpretation Act 1988.

1.3. All headings in these Conditions are for ease of reference only, and shall not affect the construction of the Contract.

1.4. Any reference in these Conditions to a statutory provision will include all subsequent modifications.

1.5. All undefined words and expressions are to be given their normal English meaning within the context of this Contract. Any dispute as to the interpretation of such undefined words and expressions shall be settled by reference to the definition in the Shorter Oxford English Dictionary.

2. PRECEDENCE

To the extent that the following documents form the Contract, in the case of conflict of content, they shall have the following order of precedence:

- Conditions of Contract including Appendix, Data Protection Schedule and any Special Conditions;
- Specification;
- Pricing Schedule, Programme;
- Drawings, maps or other diagrams.

3. CONTRACT SUPERVISOR

The Contractor shall strictly comply with any instruction given by the Contract Supervisor concerning or about the Contract provided such instructions are reasonable and consistent with the nature, scope and value of the Contract. All such instructions shall be in writing. The Contractor is not obliged to comply with any verbal instruction from the Contract Supervisor that is not confirmed in writing within 7 working days.

4. THE SERVICES

4.1. With the exception of Agency derived Data, the Contractor shall provide all staff, equipment, materials and any other requirements necessary for the

performance of the Contract using reasonable skill, care and diligence, and to the reasonable satisfaction of the Contract Supervisor.

4.2. The Contractor shall only employ in the execution and superintendence of the Contract persons who are suitable and appropriately skilled and experienced. The Contract Supervisor shall be at liberty to object to and require the Contractor to remove any person employed in or about the Contract who is unsuitable, misconducts himself, is incompetent or negligent in the performance of his duties or persists in conduct which could endanger the health or safety of others. Such persons shall not be employed again on the Contract without the Permission of the Contract Supervisor.

5. ASSIGNMENT

5.1. The Contractor shall not assign, transfer or sub-contract the Contract, or any part of it, without the Permission of the Contract Supervisor.

5.2. Any assignment, transfer or sub-contract entered into, shall not relieve the Contractor of any of his obligations or duties under the Contract.

5.3. Nothing in this Contract confers or purports to confer on any third party any benefit or any right to enforce any term of the Contract.

6. CONTRACT PERIOD

The Contractor shall perform the Services within the time stated in the Appendix, subject to any changes arising from Condition 10 (Variations,) and/or Condition 11 (Extensions of time.).

The Authority wish to include a break clause within the contract following the delivery of Task 3. The Authority retain the right to end the contract at this point at their sole discretion and will give 30 days' notice of their wish to implement this break clause.

7. PROPERTY

7.1. All property issued by the Agency to the Contractor in connection with the Contract shall remain the property of the Agency, and shall be used in the execution of the Contract, and for no other purpose whatsoever without the prior approval of the Contract Supervisor.

7.2. The Contractor shall keep all Agency Property in safe custody and good condition, set aside and clearly marked as the property of the Agency.

7.3. On expiry or earlier termination of the Contract the Contractor shall, if so required, either surrender such property to the Agency or otherwise dispose of it as instructed by the Contract Supervisor.

8. MATERIALS

8.1. With the exception of Agency derived Data, the Contractor shall be responsible for establishing his own sources of supply for goods and materials and will be responsible for ensuring the reasonable and proper conduct by his suppliers and staff whilst on the Agency's premises.

8.2. The Contractor shall not place, or cause to be placed, any orders with suppliers or otherwise incur liabilities in the name of the Agency or any representative of the Agency.

9. SECURITY

9.1. The Contractor shall be responsible for the security of all goods and equipment belonging to the Agency and used by the Contractor in the provision of the Services, belonging to the Contractor, or Contractors staff, or sub-contractors whilst on Agency premises.

9.2. This Condition shall not prejudice the Agency's rights under Condition 15.

10. VARIATIONS

10.1. The Contract Supervisor may vary the Contract by adding to, deleting or otherwise modifying the Services to be supplied, by written order to the Contractor provided such variations are reasonable and consistent with the nature, scope and value of the Contract.

10.2. The value of any such variation, other than any variation arising out of Condition 10.3, shall be determined by reference to the rates contained in the Pricing Schedule. Where the Services so ordered are not covered in the Pricing Schedule, they shall be valued at a fair and reasonable rate agreed between the Contract Supervisor and the Contractor.

10.3. Where a variation is the result of some default or breach of the Contract by the Contractor or some other cause for which he is solely responsible, any additional cost attributable to the variation shall be borne by the Contractor.

10.4. The Contractor may also propose a variation to the Services but no such variation shall take effect unless agreed and confirmed in writing by the Contract Supervisor.

10.5. No variation shall have the effect of invalidating the Contract, or placing the Contract at large, if that variation is reasonably consistent with the nature, scope and value of the Contract. The Agency may vary the Contract to comply with a change in English Law. Such a change will be effected by the Contract Supervisor notifying the Contractor in writing.

10.6. The Agency may assign, novate or otherwise dispose of its rights and obligations under the Contract or any part thereof to:

10.6.1. any Contracting Authority; or

10.6.2. any other body established by the Crown or under statute in order substantially to perform any of the functions that had previously been performed by the Agency; or

10.6.3. any private sector body which substantially performs the functions of the Agency, provided that any such assignment, novation or other disposal shall not increase the burden of the Contractor's obligations under the Contract.

10.7. Any change in the legal status of the Agency such that it ceases to be a Contracting Authority shall not affect the validity of the Contract. In such circumstances the Contract shall bind and inure to the benefit of any successor body to the Agency.

11. EXTENSIONS OF TIME

11.1. Should the performance of the Contract be directly delayed by any cause beyond the reasonable control of the Contractor, and provided that the Contractor shall first have given the Contract Supervisor written notice within five working days after becoming aware that such delay was likely to occur, then the Contract Supervisor, if satisfied that this Condition applies:

11.1.1. in the case of any delay of which the Agency is not the cause, may grant the Contractor such extension of time, as in his opinion is reasonable, having regard without limitation, to any other delays or extensions of time that may have occurred or been granted under the Contract. The Contract Price shall not increase as a result of such an extension of time.

11.1.2. in the case of any delay of which the Agency is the cause, shall grant the Contractor a reasonable extension of time to take account of the delay.

11.2. No extension of time shall be granted where in the opinion of the Agency the Contractor has failed to use reasonable endeavours to avoid or reduce the cause and/or effects of the delay.

11.3. Any extension of time granted under this Condition shall not affect the Agency’s rights to terminate or determine the Contract under Conditions 13 and 14.

12. DEFAULT

12.1. The Contractor shall be in default if he:

12.1.1. fails to perform the Contract with due skill, care, diligence and timeliness;

12.1.2. refuses or neglects to comply with any reasonable written instruction given by the Contract Supervisor;

12.1.3. is in breach of the Contract.

12.2. Where in the opinion of the Contract Supervisor, the Contractor is in default, the Contract Supervisor may serve a Notice giving at least five working days in which to remedy the default.

12.3. If the Contractor fails to comply with such a Notice the Contract Supervisor may, without prejudice to any other rights or remedies under the Contract, take over for as such a period as is necessary the performance of the relevant part of the Contract and make other arrangements for its completion. Any extra costs arising from this action, will be paid by the Contractor or deducted from any monies owing to him.

13. TERMINATION

13.1. The Agency may immediately, without prejudice to any other rights and remedies under the Contract, terminate all or any part of the Contract by Notice in writing to the Contractor, Receiver, Liquidator or to any other person in whom the Contract may become vested, if the Contractor:

13.1.1. fails in the opinion of the Contract Supervisor to comply with (or take reasonable steps to comply with) a Notice under Condition 12.2.

13.1.2. becomes bankrupt or insolvent, or has a receiving order made against him, or makes and arrangement with his creditors or (being a corporation) commences to be wound up, not being a voluntary winding up for the purpose of reconstruction or amalgamation, or has a receiver, administrator, or administrative receiver appointed by a Court.

'Termination under the Regulations'

13.2. The Agency may terminate the Contract on written Notice to the Contractor if:

13.2.1. the contract has been subject to a substantial modification which requires a new procurement procedure pursuant to regulation 72(9) of the Regulations;

13.2.2. the Contractor was, at the time the Contract was awarded, in one of the situations specified in regulation 57(1) of the Regulations, including as a result of the application of regulation 57(2), and should therefore have been excluded from the procurement procedure which resulted in its award of the Contract; or

13.2.3. The Contract should not have been awarded to the Contractor in view of a serious infringement of the obligations under the Treaties and the Regulations that has been declared by the Court of Justice of the European Union in a procedure under Article 258 of the TFEU.

14. DETERMINATION

14.1. Without prejudice to any other rights or remedies under the Contract, the Agency reserves the right to determine the Contract at any time by giving not less than one month's Notice, (or such other time period as may be appropriate).

14.2. The Agency shall pay the Contractor such amounts as may be necessary to cover his reasonable costs and outstanding and unavoidable commitments necessarily and solely incurred in properly performing the Contract prior to determination.

14.3. The Agency will not pay for any costs or commitments that the Contractor is able to mitigate and shall only pay those costs that the Agency has validated to its satisfaction. The Agency's total liability under this Condition shall not in any circumstances exceed the Contract Price that would have been payable for the Services if the Contract had not been determined.

15. INDEMNITY

15.1. Without prejudice to the Agency's remedies for breach of Contract, the Contractor shall fully indemnify the Agency and its staff against any legally enforceable and reasonably mitigated liability, loss, costs, expenses, claims or proceedings in respect of:

15.1.1. death or injury to any person;

15.1.2. loss or damage to any property excluding indirect and consequential loss;

15.1.3. infringement of third party Intellectual Property Rights

which might arise as a direct consequence of the actions or negligence of the Contractor, his staff or agents in the execution of the Contract.

15.2. This Condition shall not apply where the damage, injury or death is a direct result of the actions, or negligence of the Agency or its staff.

16. LIMIT OF CONTRACTOR'S LIABILITY

16.1. The limit of the Contractor's liability for each and every claim by the Agency, other than for death or personal injury, whether by way of indemnity or by reason of breach of contract, or statutory duty, or by reason of any tort shall be:

16.1.1. the sum stated in the Appendix;

16.1.2. if no sum is stated, the Contract Price or five million pounds whichever is the greater.

17. INSURANCE

17.1. The Contractor shall insure and maintain insurance against liabilities under Condition 15 (Indemnity) in the manner and to the values listed in the Appendix to these Conditions. If no sum is stated, the value insured shall be £5M (five million pounds.)

17.2. If specifically required by the Agency, nominated insurances shall be in the joint names of the Contractor and the Agency.

17.3. The Contractor shall, upon request, produce to the Contract Supervisor documentary evidence that the insurances required are fully paid up and valid for the duration of the Contract.

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 Contract or for showing or refraining from showing favour or disfavour to any person in relation to the Contract.

18.2. The Contractor shall take all reasonable steps, in accordance with good industry practice, to prevent fraud by the Contractor's staff and the Contractor (including its shareholders, members and directors) in connection with the Contract and shall notify the Agency 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 Contractor's staff engages in conduct prohibited by this clause 18 or commits fraud in relation to the Contract or any other contract with the Crown (including the Agency) the Agency may:

18.3.1. terminate the Contract and recover from the Contractor the amount of any loss suffered by the Agency resulting from the termination, including the cost reasonably incurred by the Agency of making other arrangements for the supply of the Goods and any additional expenditure incurred by the Agency throughout the remainder of the Contract; or

18.3.2. recover in full from the Contractor any other loss sustained by the Agency in consequence of any breach of this clause.

18.4. The Contractor shall not, directly or indirectly through intermediaries commit any offence under the Bribery Act 2010 (as amended), in any of its dealings with the Agency.

19. MONITORING AND AUDIT

19.1. The Contract Supervisor may inspect and examine the Services being carried out on the Agency's premises, or elsewhere at any reasonable time. Where the Services are being performed on other than the Agency's premises, reasonable notice to inspect shall be given to the Contractor. The Contractor shall give all such facilities as the Contract Supervisor may reasonably require for such inspection and examination.

20. CONTRACT PRICE

20.1. The Contract Price will be paid by the Agency to the Contractor as amended by any Variations ordered under Condition 10 (Variations).

20.2. In addition to the Contract Price, the Agency will pay to the Contractor such Value Added Tax (if any) as may properly be chargeable at rates ruling at the time of invoice.

21. INVOICING AND PAYMENT

21.1. Invoices shall only be submitted for work already satisfactorily completed, and accompanied by such information as the Contract Supervisor may reasonably require to verify the Contractor's entitlement to payment. Such invoices will be paid in 30 days from receipt by the Agency.

21.2. If any sum is payable under the Contract by the Contractor to the Agency, whether by deduction from the Contract or otherwise, it will be deducted from the next available invoice.

21.3. If the Contractor enters into a sub-contract with a supplier for the purpose of performing its obligations under the Contract, it shall ensure that a provision is included in the sub-contract which requires payment to be made of all sums due from it to the sub-contractor within 30 days from the receipt of a valid invoice.

22. INTELLECTUAL PROPERTY RIGHTS

22.1. All Prior Rights used in connection with the Services shall remain the property of the party introducing them. Details of each party's Prior Rights are set out in the Prior Right Schedule to this contract.

22.2. All Results shall be the property of the Agency.

22.3. The Resulting Rights in any Results, and any interim results shall, from the time they arise, be the property of the Agency and the Agency shall be free, should it so wish, to apply at its own expense for patent or other protection in respect of the Results or any interim results. The Agency's intention to apply for such patent or other protection shall be notified to the Contractor. Such applications for patents or other registered intellectual property rights shall be filed in the name of the Agency.

Unless otherwise agreed in writing between the Contractor and the Agency, the Contractor hereby:

22.3.1. assigns to the Agency all Resulting Rights

22.3.2. grants the Agency a non-exclusive, non-transferable (save for the purposes of sub-licensing, reorganisation or transfer to a successor body, for the purposes of all the successor body's normal business use), irrevocable , royalty free perpetual licence to the Agency in respect of all the Contractor's Prior Rights necessary in order for the Agency to use or exploit the Resulting Rights.

22.4. The Contractor undertakes to the Agency not to use, exploit or deal with any of the Agency's Prior Rights, other than in the performance of the Contract unless the Contractor has first obtained a written licence from the Agency, in specific terms to do so.

22.5. The Agency undertakes to the Contractor not to use or exploit the Contractor's Prior Rights, save as provided in Condition 22.3.2.

22.6. The Contractor warrants to the Agency that the performance of the Services, the Contractor's Prior Rights and the Results shall not in any way infringe any intellectual property rights of any third party.

22.7. If the Contractor is prevented from carrying out his obligations under the Contract due to any infringement or alleged infringement of any Intellectual Property Rights, the Agency may without prejudice to any other rights and remedies under the Contract, exercise the powers and remedies available to it under Conditions 13 and 14, Termination and Determination respectively.

22.8. The Contractor shall not be liable if such infringement arises from the use of any design, technique or method of working provided by or specified by the Agency.

22.9. The Contractor waives in favour of the Agency its rights to object to derogatory treatment of the Results of the Work and the Contractor also agrees that he will not assert or seek to enforce against the Agency and/or any other person, firm or company any of its moral rights as defined in the Copyright Designs and Patents Act 1988 (as amended) without the prior agreement of the Agency.

22.10. The Contractor shall not be liable for any consequential losses, damage or injuries arising from third party misuse of the Results, of which the Contractor is not aware.

23. WARRANTY

The Contractor warrants that the Services supplied by him will be discharged with reasonable skill, care and diligence.

24. STATUTORY REQUIREMENTS

The Contractor shall fully comply with all relevant statutory requirements in the performance of the Contract, including, but not limited to the giving of all necessary notices and the paying of all fees.

25. ENVIRONMENT, SUSTAINABILITY AND DIVERSITY

25.1. The Contractor in the performance of this Contract should adopt a sound proactive environmental approach, designed to minimise harm to the environment, to conserve energy, water, wood, paper and other resources, reduce waste and phase out the use of single-use plastic, ozone depleting substances and minimise the release of greenhouse gases, volatile organic compounds and other substances damaging to health and/or the environment, and be able to provide proof of so doing to the Agency on demand.

25.2. The Agency is committed to ensuring that workers employed within its supply chains are treated fairly, humanely and equitably. The Agency expects the Contractor to share this commitment and to understand any areas of risk associated with this and work to ensure they are meeting International Labour Standards. The Contractor ensures that it and its sub-contractors and its supply chain:

25.2.1. comply with the provisions of the Modern Slavery Act 2015;

25.2.2. pay staff fair wages (and pays its staff in the UK not less than the Foundation Living Wage Rate); and

25.2.3. Implement fair shift arrangements, providing sufficient gaps between shifts, adequate rest breaks and reasonable shift length, and other best practices for staff welfare and performance.

25.3. The Contractor should support the Agency to achieve its Public Sector Equality Duty by complying with the Agency's policies (as amended from time to time) on Equality, Diversity and Inclusion (EDI). This includes ensuring that the Contractor (and their sub-contractors) in the delivery of its obligations under this Contract:

25.3.1. eliminates discrimination, harassment, victimisation and any other conduct that is prohibited by or under the Equality Act 2010;

25.3.2. advances equality of opportunity between people who share a protected characteristic and those who do not; and

25.3.3. fosters good relations between people who share a protected characteristic and those who do not.

25. PUBLICITY

The Contractor shall not advertise or publicly announce that he is supplying Services or undertaking work for the Agency without the Permission of the Contract Supervisor.

26. LAW

This Contract shall be governed and construed in accordance with the Law, and subject to the jurisdiction of the courts of England.

27. WAIVER

27.1. No delay, neglect or forbearance by the Agency in enforcing any provision of the Contract shall be deemed to be a waiver, or in any other way prejudice the rights of the Agency under the Contract.

27.2. No waiver by the Agency shall be effective unless made in writing.

27.3. No waiver by the Agency of a breach of the Contract shall constitute a waiver of any subsequent breach.

28. ENFORCEABILITY AND SURVIVORSHIP

28.1. If any part of the Contract is found by a court of competent jurisdiction or other competent authority to be invalid or legally unenforceable, that part will be severed from the remainder of the Contract which will continue to be valid and enforceable to the fullest extent permitted by law.

28.2. The following clauses shall survive termination of the Contract, howsoever caused: 13, 14, 15, 22, 23, 24, 27, 29, 30, 31, 32 and 33.

29. DISPUTE RESOLUTION

29.1. All disputes under or in connection with this agreement shall be referred first to negotiators nominated at a suitable and appropriate working level by the Agency and the Contractor.

29.2. If the parties' negotiators are unable to resolve the dispute within a period of forty five days from its being referred to them, the dispute shall be referred at the instance of either party to the parties' respective senior managers or directors (supported as necessary by their advisers).

29.3. If the parties' respective senior managers or directors are unable to resolve the dispute within forty five days the dispute shall be referred to the Centre for Dispute Resolution who shall appoint a mediator and the parties shall then submit to the mediator's supervision of the resolution of the dispute.

29.4. Recourse to this dispute resolution procedure shall be binding on the parties as to submission to the mediation but not as to its outcome. Accordingly all negotiations connected with the dispute shall be conducted in strict confidence and without prejudice to the rights of the parties in any future legal proceedings. Except for any party's right to seek interlocutory relief in the courts, no party may commence other legal proceedings under the jurisdiction of the courts or any other form of arbitration until forty five days after the appointment of the mediator.

29.5. If, with the assistance of the mediator, the parties reach a settlement, such settlement shall be put in writing and, once signed by a duly authorised representative of each of the parties, shall remain binding on the parties.

29.6. The parties shall bear their own legal costs of this dispute resolution procedure, but the costs and expenses of mediation shall be borne by the parties equally.

29.7. Any of the time limits in Conditions 30 may be extended by mutual agreement. Such agreed extension shall not prejudice the right of either party to proceed to the next stage of resolution.

30. GENERAL

30.1. Neither party to the Contract will be liable to the other for any delay in performing or failing to perform its obligations (other than a payment obligation) under the Contract because of any cause outside its reasonable control. Such delay or failure will not constitute a breach of the Contract and the time for performance of the affected obligation will be extended by a reasonable period.

30.2. The Contract contains the whole agreement between the parties and supersedes all previous communications, representations and arrangements, written or oral. It is accepted that the Contract has not been entered into on the basis of any representations that are not expressly contained in the Contract.

31. FREEDOM OF INFORMATION ACT

31.1. The Agency is committed to open government and to meeting its responsibilities under the Freedom of Information Act 2000 (as amended) ('Act') and the Environmental Information Regulations 2004 (as amended) (Regulations').

31.2. The Contractor agrees that:

31.2.1. All information submitted to the Agency may need to be disclosed by the Agency in response to a request under the Act or the Regulations; and

31.2.2. The Agency may include information submitted (in whole or in part) in the publication scheme which it maintains under the Act or publish the Contract, including from time to time agreed changes to the Contract, to the public.

31.3. If the Contractor considers that any of the information included in its tender, or that it has submitted to the Agency or that is otherwise contained in the Contract, is commercially sensitive, it shall identify and explain (in broad terms) what harm may result from disclosure if a request is received, and the time period applicable to that sensitivity. The Contractor acknowledges that if it has indicated that information is commercially sensitive, such information may still be required to be disclosed by the Agency under the Act or the Regulations. The receipt of any material marked 'confidential' or equivalent by the Agency shall not be deemed to infer that the Agency agrees any duty of confidentiality by virtue of that marking.

32. DATA PROTECTION

32.1. In the event that the Contract requires data to be processed within the meaning of the Data Protection Legislation the Data Protection Schedule shall be completed by the Parties and provisions and definitions therein shall apply and bind the Parties as part of this Contract.

Appendix 1 to Conditions Services

Ref: [redacted]
Title: East Hampshire Chichester Chalk Groundwater Model Update

		Condition
1	Contract Supervisor	3

[redacted]

2	Contractor	

«Groundwater Science Ltd»

Address:
Windsor House
Windsor Place
Shrewsbury
SY1 2BY

3	Completion	6

Contract Start Date	«14th December 2020»
Contract End Date	«01st December 2021»

4	Delivery	11

Address:-
Insert delivery address if different to above

5	Insurance	17

Professional Indemnity Min. Cover	£1 million
Third Party Minimum Cover	£1 million
Public Liability Min. Cover	£1 million

6	Limit on Liability	16

Limit on Contractors Liability	£1 million

Appendix 2 - Specification

Overview:

Historically the East Hants Chichester Chalk (EHCC) model has underpinned the outcomes of many Restoring Sustainable Abstractions (RSA) and Water Framework Directive (WFD) water resource investigations. Portsmouth Water use the model to feed into their Water Resources model which in turn informs the Water Resource Management Plan and Drought Plans. Portsmouth Water have also used the numerical model to delineate catchments based on actual abstractions to use alongside the SPZ's and improve understanding of the catchments.

This model was last updated in 2012 and is a valuable asset which needs to be maintained so it is fit for purpose. It is essential for sharing a common conceptual understanding with key stakeholders to support optimal resource development therefore the model should be updated now.

Drivers for future work:

Drivers for updating the model include:

1) Maintenance of the model. Maintaining a valuable asset, by updating with new modelling software Modflow6. Update the time series data to 2020. Last updated to Oct 2011.
2) Incorporating new conceptual understanding and refine key areas. Also, to update the geological model with Chalk surfaces mapped by BGS published in April 2020.
3) Portsmouth Water WINEP no deterioration investigation for Soberton in the Meon Catchment. (deadline March 2022). Improvement to the current model needs to be made in representing flows in the River Meon. The process of reviewing the conceptual understanding will inform the WINEP investigation and the updated model should be ready to provide scenarios.
4) Worlds End /Maindell development project. Groundwater modelling and risk assessment of impacts on surface water bodies. This will be carried out using the current EHCC model. However, if source development proves to be viable then there may be a requirement to use the new model to assess impacts of this scheme.
5) The model will be used for future drought permit assessments including the impact of increasing the abstraction at Portsmouth Water source at Slindon and the Southern Water source at Madehurst on Swanbourne Lake and other water features.
6) The model will be used to carry out a review of the Ems augmentation scheme and scenarios are included to assess the effectiveness of the scheme.
7) The model will inform the new authorisations determinations that are required by August 2022. EA to provide information on the location and details of

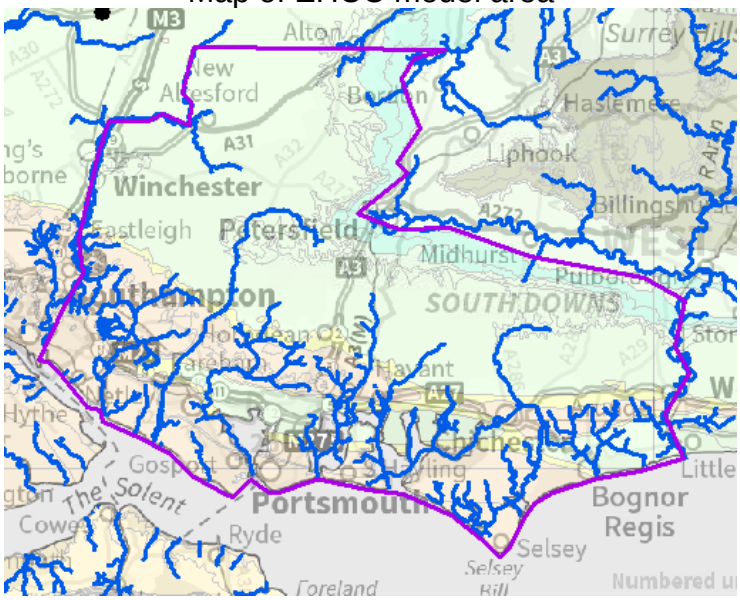
those received, which will improve the data in particular for the Chichester Coastal Plains.

8) The updated model will inform the CAMS ledger update.
9) Development of Abstraction Licensing Strategies, providing naturalised and scenario flow for Water Resource regulation work, Climate Change, Source Protection Zones, Drought scenarios etc.
10) The model is also likely to be used by WRSE in the future to consider the impact of climate change and alternative climate scenarios on river flows, groundwater levels and water resource reliability. In addition, it could be used to test abstraction scenarios to deliver environmental improvements under the EAs National Framework Environmental Ambition work.
11) The model may be required in the future to look at the implications of land use changes when working with Natural Processes, Environmental Land Management Policy and climate change
12) The updated model will be used to review and delineate Source Protection Zones when required (or in line with our programme) – not part of this update.

History of the model and what it has been used for to date:

The EHCC model was originally built in 2005 replacing separate groundwater models for East Hampshire and the Chichester Chalk Block. The original modelling project was set up in 5 phases with Phases 1 and 2 producing a conceptual and numerical model. Phase 3 allowed for additional field data to be collected in Sussex to refine and inform the conceptual understanding and then Phases 4 and 5 were the subsequent model updates carried out by Amec. The 4R (runoff and recharge) and MODFLOW components of the model were later updated up to Oct 2011. The model was refined to improve calibration following the collection of additional field data with the objective of using the model for sustainable abstraction investigations on the rivers and springs draining the eastern (Sussex) half of the model.

Map of EHCC model area



Project Plan

The project will involve reviewing and updating the conceptual model, incorporating recently acquired geological information, updating the relevant datasets (including PE and rainfall), updating the model with Modflow6 code, refinement/calibration, and model scenarios and reporting. This update will be split over two financial years with completion of the model due by **1st December 2021**.

Project structure and timescales

The Employer expects to let the contract in December 2020 and have a completion date of 1st December 2021. As the project will be split over two financial years, a break clause has been set into the contract, to ensure funds have been received to continue into the second financial year (April-Dec 2021).

A summary of the tasks and payment milestones can be found at the end of the scope. Due to funding constraints we would require tasks 1-3 to be completed by the end of March 2021, and tasks 4-7 to be completed by 1st December 2021.

The project team will consist of Environment Agency staff from Solent and South Downs and the South East Groundwater Modelling Unit. Additionally, it will include members of the three Water Companies who have abstractions within the East Hants Chichester Chalk Groundwater Model area; Southern Water, Portsmouth Water and South East Water. The Employer intends on appointing an external reviewer to the project team once this tender has been awarded.
Please note the appendices mentioned in the scope are available on request.

Modelling objectives

The overall modelling objectives are to:

- Review and update the existing conceptual model for the East Hants Chichester Chalk groundwater model
- Update the model in liaison with the Project steering group and external reviewer to ensure the model is the agreed tool to be used for regulatory purposes and support strategic water resource decisions
- Provide a model to be used by the appropriate stakeholders to meet specified drivers
- Update the existing groundwater model, using the best techniques and data available and convert the current model to MODFLOW6 code
- Bring the model up to date (February 2020)
- Refine and improve calibration of key focus areas of the model.
- Update and recalibrate the recharge model using latest gridded rainfall and PE data sets

Specific objectives can be found in the conceptual and numerical sections of this Scope.

MODFLOW6 conversion

The EHCC GW model is implemented using a version of the USGS MODFLOW which has been adapted by the Agency's National Groundwater and Contaminated Land Centre (NGWCLC) to allow for the representation of variation of hydraulic conductivity with depth within model layers (referred to as MODFLOW-VKD). The code has been further modified to incorporate a module for running stream support schemes. One of the objectives of the project is to convert or rebuild the current model with MODFLOW6 code.

Throughout Task 1, the Consultant will need to be aware of this intention to update the model to MODFLOW6 and the implications of this on the other tasks. At the end of the Conceptual stage, the Consultant will need to investigate the practicalities of converting or updating the model to MODFLOW6 code and during Task 3, the Consultant will be required to present ideas and lead a discussion on the model construction. This should include the proposed use of relevant features of MF6. MODFLOW6 can accommodate structured and unstructured grids. However, for this project it should be assumed that the model will maintain the current row and column grid structure.

TASK 1: REVIEW EXISTING MODEL AND COLLATE DATA

Purpose:

- To review existing model documentation to gain familiarisation with the current model and conceptual understanding. The conceptual and numerical model reports can be made available on request to provide the background required for this tender.
- To identify recommendations from the last update and information on key areas which need refinement.
- To collate and review data and information available since the previous update. (From October 2011/Run 127)

Task 1.1 Familiarisation of the existing East Hants Chichester Chalk model

Purpose: To review existing model documentation to gain familiarisation with the current model and conceptual understanding.

Background: The East Hampshire and Chichester Chalk Groundwater modelling project started in 2005 - replacing separate groundwater models for East Hampshire and the Chichester Chalk (EHCC) Block. Phases 1 and 2 of the project produced a conceptual and numerical model, the latter described in Entec (2007).
In October 2011, AMEC E&I UK Ltd (AMEC) was commissioned by the Environment Agency to update the 4R (runoff and recharge) and MODFLOW (groundwater) components of the model, The model was refined to improve calibration following the collection of additional field data with the objective of using the model for sustainable

abstraction investigations on the rivers and springs draining the eastern (Sussex) half of the model.

Copies of model reports and model files will be provided to the Consultant at the start of the contract.

The model consists of 2 main components:

• The ‘recharge and runoff’ model (the East Hampshire and Chichester Chalk Runoff and Recharge Model) - a daily time step model which incorporates soil moisture balance, interflow, runoff and recharge processes to calculate inputs to the top boundary of the groundwater flow model. The latest version of this code (RRRR041a) also allows for a daily ‘drip’ release from the unsaturated zone.

• The ‘groundwater flow’ model (the East Hampshire and Chichester Chalk Groundwater Model) - a two layer model simulating flow in the Chalk aquifer, run on an average 10 day time step (three per month). This model is implemented using a version of the USGS MODFLOW which has been adapted by the Agency’s National Groundwater and Contaminated Land Centre (NGWCLC) to allow for the representation of variation of hydraulic conductivity with depth within model layers (referred to as MODFLOW-VKD). The code has been further modified to incorporate a module for running stream support schemes.

Refinements reported in 2012 included:

- the addition of extremely high transmissivity zones facilitating groundwater flow along the northern flanks of the Paleogene-filled Chichester Syncline, to exit the Chalk more easily as spring flow at Havant, Fishbourne and Swanbourne Lake;
- the introduction of higher transmissivity corridors along river and winterbourne valleys to reduce the frequency of simulated surface flow in the upper sections by lowering heads so as to match actual behaviour more closely;
- small increases to Chalk specific yield across much of the model, except in the low storage, highly karstic zone draining to Swanbourne Lake;
- corrections and adjustments to MODFLOW Stream cell locations, connections, elevations and parameterisation in selected areas – often based on more focused local checking against 1:10k map line work and survey spot heights

Sub-tasks:

1.1.1 Consultant to review the existing model documentation and model files as necessary to gain an understanding of the model in its current format. [The conceptual and numerical model reports can be made available on request to provide the background required for this tender].

1.1.2 Consultant to identify recommendations from the last update and information on key areas which need refinement.

Task 1.2 Data collection: Update of model dependent datasets

Purpose: To collate and review data and information available since the previous update. (From October 2011/Run 127)

Approach: Data collection and collation should concentrate on the study area and the time period between current model end (October 2011) to February 2020. As this is an update to the model, there will be a list of sites where the data will need to be extended to present date, and to a lesser extent inclusion of new sites.
The Employer will supply a spreadsheet detailing all available data for the Consultant to review and request the format and time series of the required datasets. Note the potential greater number of observation boreholes that are now available which may require additional work (see subtask 1.2.3 for details).
All data should be requested early on in the project to avoid delays acquiring data from third parties or Water Companies.
The greater part of the data will be sourced from the Employer or water companies. In any event, the Consultant is reminded that any data obtained as part of this task shall remain the exclusive property of the Employer. The appropriate data licences will also need to be acquired.
Changes will be required to the PE and the rainfall inputs (see task Appendix B and task 1.2.3 for further information).

Sub-tasks:

1.2.1 Initially the Employer shall provide a spreadsheet listing all the data available for the model update. The consultant should then request required information at the start of the project.

1.2.2 The consultant should review all existing datasets listed below which may have previously been Q/A'd and assess which datasets need to be updated.

1.2.3 As an absolute minimum (unless the Employer has agreed otherwise) the Consultant will be expected to have acquired, updated where necessary, inspected and quality assured the following data covering the above stated study period:

- ***The most recent bedrock/superficial (1:10,000 and 1:50,000) maps for the EHCC model area.***
- **Incorporate recent additional mapping of Chalk stratigraphical surfaces and information on karst in the model area. Work EA commissioned BGS in 2019/2020**
- ***A review of the interpretations of the results of any new (from previous model) pumping tests***
- ***A review of available borehole geophysical and/or fluid logging in the area (electronic or hard copy) to establish key flow horizons that may be important for the conceptual model and potential layering of the model (Environment Agency). Available data includes Water Company source information, BGS interpreted flow logs for 18 boreholes across the model area and some additional geophysical logs may also be available.***
- ***Consider updating Soil data. Any updated or more recent soils maps (1km grid), mineral assessment reports and memoirs for the EHCC***

Catchment (Cranfield University (via LandIS.org)). There may be a need to change some datasets due to resolution.

- ***Appropriate gridded rainfall data for the area covering the model extent. (We will be changing to the GEAR or HadUK datasets – to be discussed).***
- ***Potential evapo-transpiration (monthly/weekly figures distributed on a daily basis). We will be changing to the EA PE dataset (Environment Agency).***
- ***Consider updating land use data. The land cover map has been updated (2007 and 2015) since the model was first built (CEH). There may be a need to change some datasets due to resolution. The potential change to recharge due to significant changes of landuse should be considered.***
- ***Daily river-flow records and 15-minute river level data (where available) for permanent current and disused gauging sites (Environment Agency).***
- ***Occasional current meter gauging surveys along low flow sections of the river network during summer conditions (Environment Agency).***
- ***Groundwater levels for observation boreholes in the chalk and Superficial Deposits (Environment Agency). Note there are a significant number of boreholes (approximately 400) that were not used in the calibration during the original build of the model. Currently active boreholes not on the list (92) and inactive (309) may need to be looked at and therefore time for this should be planned into the scope of works.***
- ***Licensed abstraction quantities (annual, daily and peak daily and hourly) and actual monthly groundwater abstractions for all public water abstraction sites are available from the Employer or Water Companies in various forms (Environment Agency & Water Companies).***
- ***Licensed abstraction quantities (annual, daily and peak daily and hourly) and actual monthly groundwater abstractions for all non-PWS abstraction sites currently in the model as well as any additional abstraction points not in the model that the Environment Agency require to be included (Environment Agency).***
- ***Permitted groundwater and surface water discharge data should be available from the CAMS ledger (actual effluent discharges will be provided where available) (Environment Agency).***
- ***Consider changes to mains leakage to be derived from demand zone leakage rates and population equivalents (Environment Agency and Water Companies)***
- ***Updated lidar data/bed elevation data will be provided by the Employer if available (Environment Agency).***

- ***CAMS/WFD catchment boundaries, river stretches and outflow points (Environment Agency).***
- ***New Authorisations and locations of applications received to date by the Environment Agency***

Task 1.3 Review Conceptual Model.

Purpose:

- To identify recommendations from the last update and information on key areas which need refinement.
- Update the existing model with data to Feb 2020 and run with scenarios to be agreed to help identify areas which need refinement.
- Create a Refinement Plan for the updated model agreed by the Project Steering Group (PSG).
- Review existing and new geological information.
- Incorporate any information from investigations that have been carried out since the last update.
- Review the current 4R runoff recharge model and transpose the updated conceptual information into a (new or updated) recharge runoff model capable of working with MODFLOW 6 numerical model.
- Calculate preliminary water balance.
- Ensure the PSG are fully involved via regular meetings/ webexes to agree key decisions during this task.

Focus areas

Purpose: To identify recommendations from the last update and information on key areas which need refinement.

Approach: There are a number of areas within the model that are going to be a focus of work by stakeholders and the Environment Agency during the next 5 years, and where calibration and conceptualisation of those areas needs improving. This section will detail the overall approach and list specific areas of interest and tasks associated with those areas. It is proposed that the current model should be run once updated with data to Feb 2020. Selected scenarios decided in discussion with the employer should be run to identify areas where the model needs to be improved. A refinement plan should then be drawn up for PSG consideration and agreement. The following receptors should be focused on:

Swanbourne Lake

Swanbourne Lake is a largely ornamental water feature set in the landscaped parkland to the north of Arundel Castle in Sussex. The area is designated as SSSI and at the centre of the site there is a large, shallow lake, used for boating and

recreation. The chalk in the area is known to be karstic with impacts from abstraction at Madehurst rapidly transmitted to observation boreholes close to the lake. Previous investigations resulted in changes to Portsmouth Water's Slindon licence and Portsmouth Water now have a Drought Permit option to increase abstraction at Slindon.

EA has collected monthly gaugings from the outflow from Swanbourne Lake which help with calibrating the groundwater model in that area.

As the no flow boundary is close to Swanbourne, it should be checked to see if there are any potential flows across this boundary and if this could be an issue. The understanding is that the tidal River Arun is considered to be a no flow boundary due to deep tidal deposits at this location. Evidence from Madehurst pump tests showed that the spread of impacts was solely to the west of the river. These assumptions should be reviewed as part of the conceptual review.

Bedhampton and Havant Springs

There is a general over simulation of flows within the current model mostly associated with the spring flows at Swanbourne Lake and Havant and Bedhampton Springs. It should be considered if the application of the new PE and rainfall datasets improves the overall simulation of flows.

Ems

Due to the impact of abstraction on flows in the Ems, Portsmouth Water operate a groundwater augmentation scheme. The model must be capable of simulating the use of the augmentation scheme. In 2016, the scheme was modified to augment from a different abstraction point and flow and groundwater data are available to help refine the model in that area. A scenario involving varying the abstraction at Walderton should be carried out on the existing model at this stage to identify how well the model represents the augmentation patterns in this catchment and identify changes that need to be made.

Improvements to the representation of winter flows gauged at Westbourne need to be improved. For example, winter flow peaks simulated following a dry summer remain too low in the model.

Meon

The River Meon has always been a challenge to model. It has a very narrow catchment and there are two large abstractions in the middle reaches of the river. In recent years, the two abstractions (Soberton and West Street) have been shut down for long periods so there is a real opportunity to look at hydrometric data and the output of the existing model to better understand abstraction impacts.

During conceptual phase of the modelling, the recent abstraction data should be added to the existing model to compare the model simulation of the shut downs with

the actual measured flows and groundwater levels. This will assist in improving the updated model.

Recently collected data associated with a South East Water investigation at East Meon also needs to be considered within the conceptual phase.

Improvements need to be made to improve flows at West Meon GS and Mislingford.

Aldingbourne Rife
There are still improvements to be made to the latter part of the recession curve.

Sub-tasks:
1.3.1 The Consultant shall review recommendations highlighted in the last update and with discussion with the PSG
1.3.2. The Consultant shall review recently acquired flow and groundwater level data to agree a prioritised refinement plan with the PSG designed to improve calibration. This should involve running the existing model with data updated to Feb 2020.

Geology
Purpose: The Consultant will be expected to review the current geological information available in the model, recent additional mapping of Chalk stratigraphical surfaces and information on karst in the model area. Information from existing and potentially new interpretations of flow logging should be reviewed to decide if the model would benefit from multi layers.

Approach: Some information that the Consultant should consider is:

- Influence of hard bands with relation to groundwater flow?
- Influence of karst hydrogeology

Following the original model build there were still uncertainties associated with the conceptual model related to the sub surface elevations of key stratigraphical surfaces within the Upper Chalk and the distribution and nature of the drift within the Coastal Margin. It was recommended that the Agency ask the BGS to undertake additional work including contouring of the various members of the Upper Chalk (particularly the base of the Seaford Chalk), as well as detailed mapping of the drift on key stretches of the Coastal Margin i.e. those areas where there is the potential for groundwater 'overtopping' of the Chichester Syncline. This would assist in identifying links between lithology and groundwater levels.
In addition to adding more detail to the Chalk mapping, it was suggested that an extension to the BGS Chichester Gravels survey would be useful in other areas of Chalk 'overflow' (such as investigating the role of clay-with-flints in the Hamble catchment and the head deposits in the Wallington, Chichester and Pagham catchments). However there have been insufficient resources to follow this up to date.
In preparation for this update BGS were commissioned to refine subdivisions of the upper part of the White Chalk subcrop (formerly the Upper Chalk). The new chalk surfaces include: base Culver Chalk Formation, base Newhaven Chalk Formation and base Seaford Chalk Formation. These are represented by gridded surfaces

created by this project using a combination of data from borehole geophysical logs, borehole lithological logs and outcrop data. (Employer to supply report).
In addition, BGS have also undertaken work to produce a report to provide an overview of Chalk karst in East Hampshire. This is based on a conceptual understanding of the geology derived from field mapping, geomorphology and an expert understanding of karst hydrogeology. (Employer to provide)
A report was also commissioned by the Environment Agency as part of a study reviewing and assessing the information available on the geomorphological, geological and hydrogeological properties and conditions within the Bedhampton and Havant springs (BHS) catchment area. The purpose of this review was to assess the significance of the karst features in the BHS area, whether new lines of evidence since 1998 are indicative of further karst at the surface and at depth in the area, and whether these lines of evidence indicate that a redefinition of the SPZs is required. This work may also provide additional information to aid the review of the conceptual model (employer to provide)
The EHCC GW model is currently a 2 layer model. The upper layer, Layer 1 (L1) comprises the Gravel drift and any underlying Palaeogene deposits, whilst the lower layer, Layer 2 (L2) comprises the Upper Greensand and Chalk: the primary aquifer units in the area.
Sufficient time should be allocated to reviewing available geophysical logs to enable key flow horizons to be located in relation to the new Chalk formation stratigraphical layers provided by BGS. Information from previous work by Buckley and Wood is available for 18 boreholes across the study area. Information is also available on flow horizons within Water Company boreholes. There may also be published data available.
The Test and Itchen GW model has recently been updated. Reference to the Conceptual model should also be included due to the overlap in model areas.

Sub-tasks:

1.3.4 The Consultant shall review the current geological information available in the model as well as updated Chalk surfaces and reports recently undertaken by BGS (provided by the Employer) and available borehole information on flow horizons

This should be done to understand, but not limited to, the following:

- ***the influence these geological formations (in particular the hard bands) and structure have on groundwater flow.***
- ***the importance of key flow horizons across the model area.***
- ***whether greater definition in layering would improve the numerical model***

<u>Local investigations by stakeholders</u>

Purpose: Incorporate any information from investigations that have been carried out since the last update

Background:

We are aware Portsmouth Water are carrying out investigations for increased abstraction in the Worlds End Catchment and potentially ceasing abstraction at Maindell. Outputs from the preliminary risk assessments may provide useful input to the conceptual model. Groundwater model outputs from the existing model will be

used in conjunction with field investigations to establish impacts on surface waters including the Wallington and the Meon.
Additional information may also be available from South East Water on their recent investigation at East Meon.

Sub-tasks:

The Consultant shall:

1.3.5 Incorporate any additional data available from the Water Company investigations relevant to the EHCC model

Recharge model

Purpose: For the Consultant to review the current 4R runoff recharge model, and transpose the updated conceptual information into a (new or updated) recharge runoff model capable of working with MODFLOW 6 numerical model. We are intending to continue with 4R and utilise the drip feed functionality available with this recharge model, however the efficacy of this function should be assessed.
We will be changing to the GEAR or HadUK rainfall datasets and the EA PET dataset (Environment Agency) and the early assessment of the impact on model calibration is proposed. See Appendix B for more information.

Background:

The current EHCC GW model consists of 2 main components:

• The 'recharge and runoff' model (the East Hampshire and Chichester Chalk Runoff and Recharge Model) - a daily time step model which incorporates soil moisture balance, interflow, runoff and recharge processes to calculate inputs to the top boundary of the groundwater flow model. The latest version of this code (RRRR041a) also allows for a daily 'drip' release from the unsaturated zone. This is accomplished via the use of Entec (now WOODplc) 4R recharge and runoff code. In this task this drip feed mechanism should be reviewed to ensure it does improve the summer low flow calibration as intended.

• The 'groundwater flow' model (the East Hampshire and Chichester Chalk Groundwater Model) - a two layer model simulating flow in the Chalk aquifer, run on an average 10 day time step (three per month). This model is implemented using a version of the USGS MODFLOW which has been adapted by the Agency's National Groundwater and Contaminated Land Centre (NGWCLC) to allow for the representation of variation of hydraulic conductivity with depth within model layers (referred to as MODFLOW-VKD). The code has been further modified to incorporate a module for running stream support schemes.

Both the groundwater flow model and the rainfall/runoff model are based on a common 250m by 250m fixed mesh interval grid and were refined over a simulation period from 1970 to 2011 based on comparison against field observations of river flows and groundwater levels from this period.
The recharge model will need to be adapted for application with a 'MODFLOW6 numerical model'.

We are aware that there will be significant impact on the model by introducing the PET data set. The dataset is significantly higher than the off line MOSES dataset. It is proposed that the current model is run initially with the new datasets to see the impact on calibration. Evidence to date is that the impact of the new rainfall datasets are not significant but again it is proposed that the model should be run initially to assess these differences.

Sub-tasks:

1.3.6 Consultant shall review the current 4R runoff recharge model, and transpose the updated conceptual information into the recharge runoff model and ensure it is capable of working with MODFLOW 6 numerical model.

1.3.7 Assess the potential impact of introducing the new rainfall (HADuk/Gear) and PET/PET-I datasets to be agreed with the Project Group

1.3.8. Review the efficacy of the "drip feed "function within 4R

1.3.9 Outputs shall include: tables, maps and time series data to illustrate the distribution of input parameters into the recharge model, including:

- ***Map of potential recharge zones,***
- ***Simplified potential recharge distribution, an estimate of uncertainty on potential recharge calculations, and evidenced distribution/quantity of bypass recharge.***
- ***Map of distribution of actual recharge zones***
- ***A review of alternative mechanisms and uncertainty from existing model***
- ***Review urban recharge***

<u>Calculation of preliminary water balances</u>

Purpose: To check on the estimates of the inflow and outflow components.

Approach: The Consultant is expected to calculate preliminary water balances for the model area prior to commencement of the historical modelling, but shall include the results of the Recharge Model. Water balances shall be compared to the existing recharge model and differences explained. The consultant should advise on the appropriate time periods for water balances based on the data available. The water balances will indicate the general availability of water resources in the area and how conditions have changed during the modelling period.
The Agency attaches great importance to this step in the modelling procedure since it is the first indication of the viability of the conceptual model. It is especially important as we are intending to use new PE and rainfall datasets.

Sub-task:

***1.3.10 The Consultant shall produce either a single water balance or a series of water balances for different parts of the catchment. A number of water balances should be prepared covering different time periods. If water balances are calculated for sub-areas, then the aggregation of the parts shall cover the whole of the study area. Both total water balances and groundwater balances should be presented. It is unlikely that the numerical sum of the components will be zero, but the significance and reasons for any out of balance should be discussed. Differences from the existing model shall be quantified and explained*.**

Project Management and Communication through Task 1 to 7

Regular project management meetings are required to ensure the project keeps to time and budget.

There are a number of decisions to be made throughout Task 1 which will require the Consultant to discuss and agree with the Project Team.

Sub task:

1.3.11 Project Management meetings should be programmed in to the project plan fortnightly with a regular review of the risk log.

1.3.12 Telecons/ WebEx should be arranged as necessary to ensure decisions are made with the agreement of the project team and allowances for this should be detailed in the project plan.

1.3.13 The Employer needs to be given at least 10 working days to respond to any queries/decisions to be made throughout the project.

TASK 2: COLLATION OF UPDATED CONCEPTUAL IDEAS AND CONCEPTUAL REPORT/MODEL

Purpose: To bring together the current understanding of how the flow system operates in the EHCC GW model area, and to update the existing conceptual model and report as necessary to incorporate any new ideas/data.

Approach: The requirement is to have one report at the end of the project, with separate sections detailing the conceptual and numerical phases of the project.

For the conceptual phase, a short report should be produced which mentions incremental advances in understanding and refers back to the original reports.

The report should incorporate:

- An update to the conceptual understanding including relevant hydrogeological cross-sections (between 6 and 10 is typical), water balances at appropriate time scales, relevant river and water level hydrographs and plans showing the hydraulic gradients
- Update to the geological understanding including locating potential flow horizons and how these could be incorporated into the numerical model using layering.

- Report improved understanding based on new time series, pumping tests or flow gauging carried out since the last update
- Include the agreed focus areas for refinements designed to improve calibration.
- The major sources of uncertainty
- A generalised three-dimensional colour map of the area should be produced, annotated to highlight key features.

Sub-tasks:
The consultant shall:
2.1 Review and Update the Conceptual understanding based on new available datasets
2.2 Identify key areas for refinements designed to improve calibration
2.3 Identify the major sources of uncertainty and document them in the Conceptual Report. The sources of uncertainty appropriate for the investigation during sensitivity analysis will be agreed.
2.4. Collate the conceptual ideas into an updated conceptual report explaining the current conceptual understanding of the East Hants Chichester Chalk area reflecting what has been learnt since the last report was written as detailed above.
2.5 Consider how these advances in conceptual understanding will be represented in the numerical model
2.6 Produce a draft report for feedback from the project team; to avoid too many iterations we expect the draft report to be ready before the Project Team meeting (see Task 3), followed by a period of a couple of weeks to provide final feedback.

TASK 3: MEETING TO REPORT CONCEPTUAL IDEAS AND WAY FORWARD WITH CONCEPTUAL MODEL

Purpose: To allow the Consultant to report back to the Employer after the conceptual phase, to present what has been learnt since the last update, the implications of any new conceptual ideas and linking back to the objectives.
It is also expected that the Consultant will also set out their ideas for the numerical model and discuss and agree a way forward with the model update/build/recalibration.

Approach: The Employer will convene a full Project Team meeting where it is expected that the Consultant will present results from the conceptual model update and report and lead discussions on a way forward with the numerical model.

Sub-tasks
3.1 Consultant to present results of the conceptual phase of the project to the Project Team (including stakeholders) at a full project team meeting after

the completion and dissemination of the conceptual report. The meeting should be at least 2 weeks after the conceptual report has been issued to allow collation of feedback. It is expected this meeting will not be in able to take place in the format of a 'face to face' given current COVID-19 issues, but the additional costs of a face-to-face meeting should be presented in the 'additional tasks' table in 'Section 5:2 of the ITT: Pricing schedule' in case the situation changes. The preference would be to have a face-to-face if restrictions have been lifted.

3.2 As the model is to be converted to MODFLOW6 the Consultant will need to lead the discussion on how this will be undertaken and any changes or additions to the layering within the model.

3.3 The Consultant should also include information on any new functionality available in MF6 which could be used within the project.

3.4 The Consultant shall specify how to progress with extra parameterisation required when changing to MF6 for leakance (components of VCONT) and for stream cells (components of stream conductance)

3.5 At the end of the meeting the Project Team must have an agreed Conceptual Model and way forward with the model build, for example, but not limited to: construction of the model / model code / grid size / refinement / layers / datasets / uncertainty.

3.6 The Consultant shall ensure that they comply with the 'Security and Emergency measures directive 1998' which specifies that all water company sites must be anonymised and locations not discernible to within 1km. A list of anonymised site names should be agreed with the Water Companies.

TASK 4: UPDATE, DEVELOPMENT AND REFINEMENT OF THE NUMERICAL MODEL

Background:

The EHCC GW model is implemented using a version of the USGS MODFLOW which has been adapted by the Agency's National Groundwater and Contaminated Land Centre (NGWCLC) to allow for the representation of variation of hydraulic conductivity with depth within model layers (referred to as MODFLOW-VKD). The code has been further modified to incorporate a module for running stream support schemes. There is a separate runoff-recharge model (Routing of Rainfall to Runoff and Recharge (4R)). In its current form, the model runs from 1970 until October 2011, with a preceding 5 year warm up period from 1965. The current grid resolution is 250m. The model currently has 3 time steps/month. Time steps, and model layering will be agreed at the project team meeting in Task 3.

Task 4.1 Model construction

Purpose: Preparation of all relevant recharge input & output files and of all relevant MODFLOW input files.

Verification of the input files using an agreed protocol for data checking and visualisation and the operational testing of the model operation.

Approach: Due to advances in model code development, the aim is for the Consultant to convert the EHCC model to MODFLOW6 code which is the latest version of the USGS MODFLOW family. In order to do this, the Consultant will need to set out the method by which they propose to convert the model from a USGS MODFLOW model to a MODFLOW6 model.
The Consultant shall transpose any updated conceptual understanding into the numerical model to fully represent the agreed flow behaviour of the system. This includes recharge and groundwater flow modelling. The assumptions or modifications required in simplifying the conceptual understanding into the numerical model shall be fully documented.
The current model has two layers. Model layering should be as simple as possible but also adequate to allow a credible simulation of the impacts of groundwater abstraction on the receptors of interest. The number of layers required should be informed by the revised conceptual understanding and any need to increase detail to improve the quality of modelled outputs required for the specific objectives. There should be sufficient justification for an increase and complexity of the model.
It is understood that one of the main benefits of MODFLOW6 is the possible use of various local grid refinement methods (e.g. simple 'quad tree' or 'Voronoi polygon mesh'). The current view of the Environment Agency is that there are insufficient drivers or data to change the current grid at this time.
Run times should not be excessively long (the model should take no longer than 6 hours to run; ideally quicker). Parameters should remain within credible ranges throughout. The model extent will remain the same as the last update.

It is anticipated that it will take significant time to incorporate the updated geological model into the numerical model and there maybe potential impacts on elevations and changes to the stratigraphical control may also impact flowing features occurrence

Sub-tasks:
The intricacies of the construction of the model will have been discussed during Task 3 at the end of the conceptual phase and during Task 4, but for costing purposes the expected tasks are:
4.1.1 Consultant to create a fully working robust stable model that runs to Feb 2020
4.1.2 The Consultant shall compare the calibration of any MODFLOW6 model to the calibration of the existing model to check how the conversion process has improved or worsened calibration, with possible reasons for differences identified
4.1.3 The model must be completed by 1st December 2021 and be able to fulfil all of the drivers and objectives stated in the previous sections.

Task 4.2 Model calibration and refinement

Purpose: The model calibration and refinement process involves the development of a historical model that credibly simulates groundwater levels, river flows and other flow components (if relevant), such as drainage flows & spring flows. The aim is to achieve an acceptable match between simulated and observed groundwater levels and stream flows within the constraints of the time and budget available for the work. It is anticipated due to the update of the geological model and incorporating new PE and rainfall datasets that the conversion to MF6 will require a substantial amount of work to bring the model back to its existing calibration quality.

The objective of the refinement is to:

- Rectify calibration issues that arise from the conversion
- Improve calibration in the key focus areas agreed in Task 2
- The acceptance of model refinement will be judged against the initial criteria set out in Appendix A. The acceptance criteria should be reviewed and agreed by the Project Team in the course of the refinement of the model.

Approach: The Consultant shall maintain an audit of all refinement runs and shall keep the Employer informed of any problems or successes. The audit shall also include details of any changes to the conceptual model, reviewed in Task 1, needed to effect a better match with the observed historical data. These should be reported in the Final report.

Acceptance criteria are assigned in Appendix A. They are intended, at this stage, to be a guide to help consultants in the preparation of their proposals. These will be finalised after discussion with stakeholders, the Agency's external reviewer and the consultant, at the first meeting of the TSG.

The targets will be subject to review by the PSG as the project progresses and will need to be reviewed following the sensitivity analysis. The head and flow targets shall be presented on a map.

The three baseline scenario runs (summarised in task 4.5) should be run at this stage before the period of refinement is complete. They should be revisited, revised and reported in greater detail as part of that task.

In addition, there were periods of shut down for the groundwater sources at Soberton and West Street due to pollution incidents over the last few years. The shutdown periods will have produced the equivalent of a signal test which will be useful for calibration. Therefore, an additional scenario should be run at this stage to judge the performance of the model in this catchment.

Sub-tasks

4.2.1 The model shall be calibrated and refined against the historical behaviour for the period 1970-2020 of the surface water and groundwater system until the acceptance criteria defined in Appendix A have been met or the Employer has agreed that further refinement runs are unnecessary.

4.2.2 The Consultant shall make comprehensive comparisons between field and modelled results. Outputs from the model shall be prepared for the whole of the EHCC and also reaches defined during conceptualisation. The choice of reaches should be influenced by potential choices of CAMS Water Resource Management Units and targeted catchments during this update.

4.2.3 The consultant should agree with the employer the format of the agreed outputs specified below:

a. Simulated river baseflow at the downstream end of each reach
b. Flow accretion profiles for each reach and the whole river
c. Flow Duration Curves at the downstream end of each reach
d. Flow hydrographs at the downstream end of each reach
e. Simulated naturalised baseflow at Gauging Stations
f. Plots showing gaining and losing reaches of streams
g. Simulated groundwater level hydrographs throughout the catchment
h. Maps and cross-sections of groundwater heads
i. Annual and monthly water balances for all management units with details of the recharge and discharge components.
j. Any other comparisons considered appropriate for testing whether the numerical model is able to represent the flow behaviour of the real system sufficient for the purpose of the study and the modelling objectives defined in the Background section at the start of the tender.

4.2.4 The three baseline scenario runs (summarised in Appendix B and task 4.5) should be run at this stage before the period of refinement is complete. See Appendix B and task 4.5 for more information.

4.2.5 A scenario should be run to take advantage of the recent shutdowns at Soberton and West Street to inform the calibration within this catchment.

Task 4.3 Model sensitivity analysis and validation

Purpose: The Consultant will undertake sensitivity analysis of the behaviour of the model to determine the influence of uncertainty, which for costing purposes should include 10 sensitivity runs and analysis.

Approach: The Consultant and the Employer will have identified the major sources of uncertainty in the conceptual stage (Task 2.1) and documented them in the conceptual report. The sources of uncertainty appropriate for the investigation during sensitivity analysis will be agreed.

Sub-tasks:

4.3.1 The Consultant shall perform model sensitivity analysis in order to establish the effect of uncertainly on the calibrated solution. In liaison with the Employer the Consultant shall present the convergence criteria to be used during each model run. Diagrams shall be presented by the Consultant which clearly illustrate the influence which the sources of uncertainty have on the modelled results.

Task 4.4 Results, processing and visualisation

Purpose: Appropriate post-processing of model results and clarity in presentation and visualisation is important for judging the 'fitness for purpose' of the model. It is also important that a clear view is provided on the uncertainties associated with the model results and to what extent such uncertainty relates to the conceptual model and the numerical model. The understanding of model results combined with a clear appreciation of uncertainty will lead to enhanced confidence in the model and a better appreciation of its usefulness, as well as its areas of weakness.

Approach: Deliverables should include a complete set of utilities (fortran or otherwise) source code and executables used for the update, a complete GIS dataset with shapefiles and .mxds and all the spreadsheets used for collating, processing and presenting the data and model output.
FlowMaps has recently been converted to Python and is compatible with MF6. This tool is available for presenting model output in GIS

Sub-tasks:
4.4.1 Results and visualisation tools shall be provided to the Employer before the meeting (Task 6) to ensure staff have had adequate time to investigate the results, provide feedback if necessary and prepare for the meeting.
4.4.2 The Consultant shall provide a GIS viewer which allows for drilling down into data and results. FlowMaps is available to use for this task.
***4.4.3* Consultant needs to ensure the project group sign off the model as 'fit for purpose' before moving onto running scenarios.**

Task 4.5 Baseline predictive scenarios

Approach: The definition of "scenario" here is when different abstraction/discharge configurations are used, with all other aspects remaining the same.
The three baseline scenarios may have been run during the period of refinement (4.2.4) but they should be revisited, revised and reported in more detail in this section. These are: Natural, CAMS Recent Actual Scenario (RA) and CAMS Fully licensed Scenario (FL)
See Appendix B for more information.

The RA and FL profiles should be agreed with project team during task 4.2.4. Information on abstraction data should be requested from Water Companies at the start of the project.
In addition to the three baseline scenarios, further site specific scenarios are required to check the suitability of the model for the specific tasks it is intended to be used for. Specific output from these scenarios should be analysed during model refinement (Task 4.2) and sensitivity (Task 4.3) to check that the model outputs are credible and not overly sensitive to changes in model parameters. The suggested alternative scenarios are based on the Recent Actual scenario but involve:

- Switching off public water supply abstractions at Soberton and West Street and looking at groundwater levels and river flows in the immediate vicinity of those sources and carrying out simple water balance checks on a water body scale to see where the difference between this scenario and the Recent Actual scenario have been attributed.
- A scenario involving the abstractions for new authorisations – details to be confirmed by the employer. There is a requirement to assess the impact of licensing the new authorisations within the catchment.

Sub-task:
4.5.1 The Consultant shall run and provide the results of the three baseline predictive and two site specific scenarios as outlined above. All the outputs listed under task 4.2.3 will be considered and conclusions drawn. For future predicted scenario see task 4.6.6.

Task 4.6 Other issues related to WRGIS, CAMS/WFD and Abstraction Licensing

Groundwater models can support CAMS by improving natural flow estimates, groundwater abstraction representation and catchment conceptualisation. The CAMS ledgers also feed into WRGIS and provide a basis for abstraction licensing.
Sub-tasks:
The consultant shall:
4.6.1 Ensure MODFLOW stream cells for the main rivers follow the WFD river water body lines.
4.6.2 Find the stream cells which represent the WFD water body outflow points and CAMS assessment points - adding to the list of 'compliance points' - to get estimates of historic flows, natural flows, & scenario flows (full licensed & recent actual)
4.6.3 Decide which assessment points are credible and best represented by the groundwater model - mapping the coverage of 'modelled' rivers and wetland receptors
4.6.4 Check that the 'full licensed' and 'recent actual' scenario assumptions for abstractions and discharges in the model are consistent with Area CAMS Ledger (and WR GIS) expectations. There is also a need for checking with water companies. These profiles need to be agreed by the Project Team.
4.6.5 Ensure that all of the 'low flow mitigation' components of the abstraction licensing system are properly represented (hands-off flow conditions, hands

off levels, compensation discharges etc) so the 'full licensed' scenario is credible.

4.6.6 Agree a credible 'future predicted' scenario and run this through the groundwater model.

4.6.7 Produce annual (water year and calendar year) modelled recharge values for groundwater management units

TASK 5: REPORTING

Purpose: The final report should contain the conceptual and numerical sections. The deliverables are listed in task 5.4.

The numerical model section of the report is intended primarily for internal use by the Agency and stakeholders. The report will explain clearly how the model has been developed and refined. Any uncertainties or inadequacies of the model should be stated and possible methods of resolving these uncertainties (by field work and/or further model development) should be explained.

The numerical report with appendices (such as the log of model runs and complete sets of figures showing how model refinement led to an improved simulation) should provide a comprehensive record of the methodologies adopted and the findings of the numerical modelling study.

It should be sufficiently complete for the employer or another consultant to update and improve the model, when used in conjunction with previous reports. It should also contain any changes to the conceptual model following calibration.

Approach: The model reporting should be factual and report on impacts at key receptors, as well as providing 'whole model' overview checks as a reassurance that each scenario has been run correctly, with patterns of predicted impact which can be explained. The main focus will be on the objectives of the modelling study, although results may be of general or even specific interest to beneficiaries and stakeholders. It is important that the report clearly covers the main drivers for the modelling study. This does not exclude reporting on more regional or even localised issues, if these have been identified in the course of the study.

Sub-tasks:

5.1 The Consultant shall produce a draft numerical report which should be provided electronically in a format agreed by the Employer.

The report must include the following items:

- ***Presentation of details of model update and process of conversion to MODFLOW6***
- ***Presentation of details of the model refinement and sensitivity analysis including comparison of modelled and observed river and groundwater hydrographs, river aquifer interactions and groundwater hydraulic gradients and flow directions. This should include a log of model runs and complete sets of figures showing how model refinement led to an improved simulation***.
- ***Any revised understanding of the hydrogeology, recharge, surface water-groundwater interactions;***
- ***Model piezometric maps and groundwater cross sections***

- ***Deductions as to the impact of historical groundwater abstractions on surface water flows and regional groundwater levels.***
- ***Results from scenario runs***
- ***Assumptions and limitations made within the calibrated model.***

5.2 The Consultant shall present and discuss the draft report at a progress meeting between the Project Manager and Senior Modeller of the Consultant and the Project Team (see Task 6).

5.3 The Consultant should allow up to three weeks for consideration by the Employer/Project Team of the draft report and any modifications required for the final report. Any presentation materials used during the meeting should later be made available to the Employer.

5.4 The Consultant shall produce a final report which combines the conceptual and numerical sections. This should be provided in a format agreed by the Employer. Method of transferring the data to be agreed. Deliverables should include but not be limited to:

Conceptual model:

- ***GIS files (shapefiles, GRID files etc.) with an .mxd file,***
- ***Supporting spreadsheets with QC of data,***
- ***Spreadsheets with infrastructure project data,***
- ***Supporting analysis spreadsheets,***
- ***Recharge model files, executable and source code, run log,***
- ***Utilities executables and source code,***
- ***Reference material, copyright permitting,***
- ***Geological cross sections or additional geological data.***
- ***Any collations of borehole-specific data***

Numerical model update:

- ***GIS files (shapefiles, GRID files etc.) with an .mxd file,***
- ***Supporting analysis, pre-processing and post-processing spreadsheets including calibration spreadsheets showing head calibration graphs, flow calibration graphs, flow duration curves, accretion profiles and comparisons with existing model output,***
- ***Numerical model files, executable, run log (MODFLOW6 executable from USGS to be used with no alterations),***
- ***Utilities executables and source code,***
- ***Numerical report to include full documentation of Modflow 6 implementation.***

Further scenarios

- ***Commented abstraction/discharge spreadsheets for each scenario***
- ***Full model file set for each scenario***

5.5 Results should be presented using the recently updated FlowMaps, a post processing tool/GIS viewer, which allow for drilling down into data and results

5.6 The Consultant shall ensure that they comply with the 'Security and Emergency measures Directive 1998' which specifies that all water company sites must be anonymised and locations not discernible to within 1km. A list of anonymised site names should be agreed with the Water Companies.

TASK 6: MEETING TO PRESENT RESULTS OF NUMERICAL MODEL

Purpose: To present the results of the model build/conversion to the project group and to formally sign off the model as 'fit for purpose'.

Sub-tasks:

6.1 The Consultant shall present the findings and results of the numerical model development, refinement, sensitivity analysis and baseline scenario runs ideally at a face to face meeting with the Project Team (COVID-19 restrictions may still be in force in which case it will need to be undertaken in the format of a webex).

6.2 The Consultant shall ensure the model is signed off as fit for purpose by the Project Team and External Reviewer. If further work is needed to ensure the model is fit for purpose this will need to be agreed by the Employer.

TASK 7: MODEL HANDOVER & SIGNOFF

In order to sign off the model project as completed, the Employer will need to have received all of the model files, the updated conceptual model/report, and the updated recharge/numerical model(s) and report. Each task will have been signed off as complete by the Project Team.

The model needs to be able to meet all the drivers of the model and will need to be a fully working robust stable model that runs to March 2020.

The Employer will require the Consultant to run a one day workshop/course for two Environment Agency staff to provide training on the updated model. This could be face-to-face or online.

For the avoidance of doubt, tenderers need to ensure that the EHCC Groundwater model whose update forms part of this tender and any model runs or other outputs therefrom will be usable by the Employer completely without any restriction whatsoever whether as a result of any contractor intellectual property used in the course of the updating work or any other possible rights of the contractor or other person.

Sub-tasks

7.1 The Consultant shall ensure that the Employer has received all of the model files, the updated conceptual model/report, and the updated recharge/numerical model(s) and report. Each task will have been signed off as complete by the Project Team.

7.2 The Consultant will run a one day workshop/course for 2 Environment Agency staff at the Employer's office (on Employer's hardware) to provide initial training to include, but not limited to:

- ***the setup and use of the model(s)***

- ***testing outputs***
- ***the development of utilities***
- ***running scenarios***

This may need to be run as a series of WebEx's if COVID-19 restrictions are still in place.

Performance Measures

Performance will be monitored throughout the project, during the required meetings outlined in the scope. Progress will be monitored, and regular communication will ensure the project remains on track to the programme developed in the tender period. Bidders should provide a clear metric for performance measurement, which the Authority will be able to use to monitor quality and progress.

Key Personnel

The Key Personnel for this contract and the number of hours they will contribute to each task are outlined in the table below;

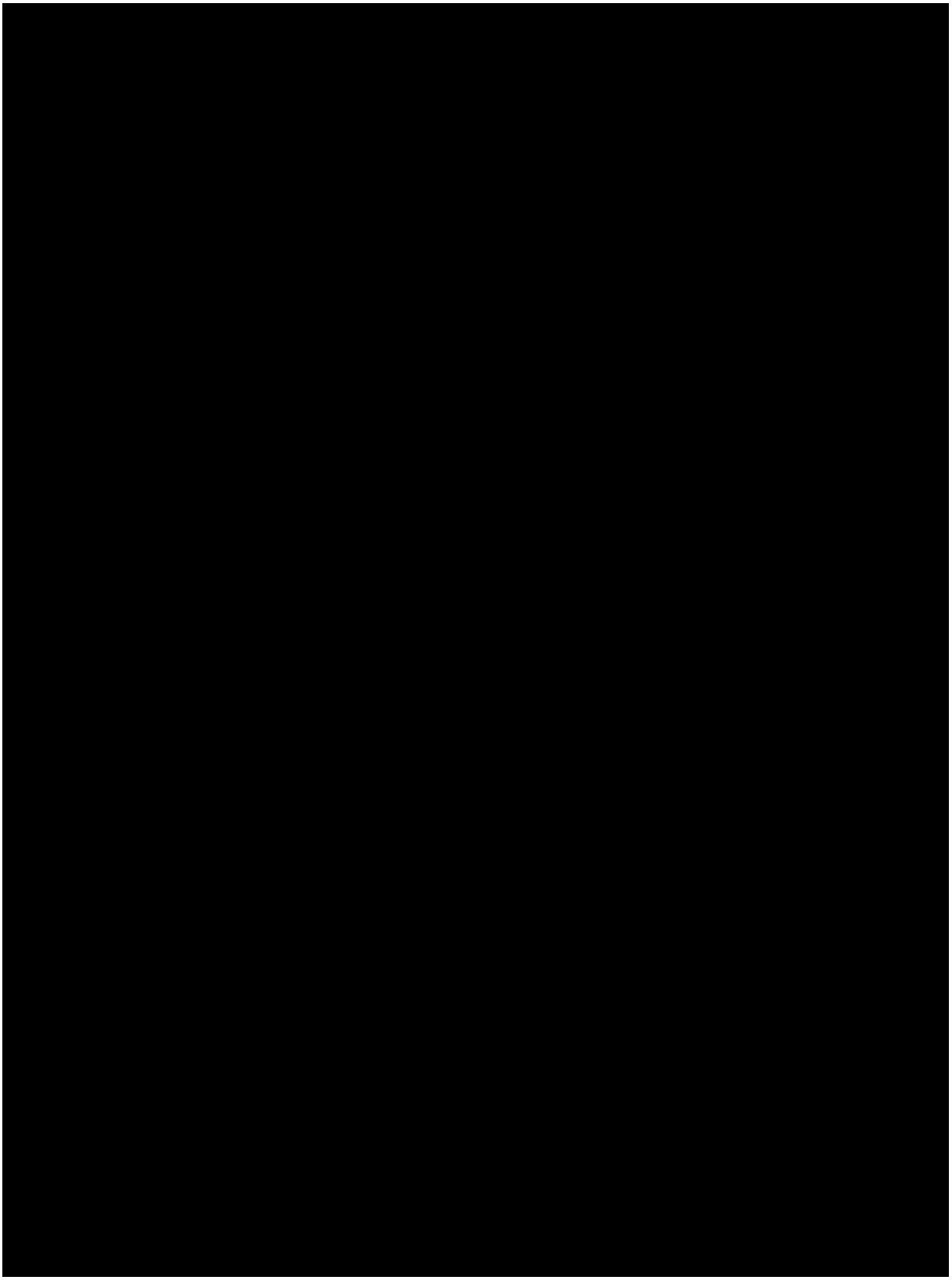
Appendix 3 - Pricing Schedule and Invoice Schedule

SUMMARY OF TASKS, SIGN OFF AND PAYMENT MILESTONES

A summary of the tasks and payment milestones can be found in the table below. Due to funding constraints we require tasks 1-3 to be completed by the end of March 2021, and tasks 4-7 to be completed by 1st December 2021.

There will be many discussions and decisions to be made throughout the project requiring agreement from the Environment Agency or the PSG, however there are 5 key sign off points in the project and these are listed in the table below (please refer back to relevant sections of the Specification for more detailed information).

Task	Summary of sub tasks	Due Date (see Appendix 4 Programme)	Specific sign off tasks	Payment milestone (to be agreed)
Task 1: review existing model and collate data	Task 1.1 – 1.3 (including all sub tasks)	12/02/2021	1.3.2 (prioritised refinement plan)	
Task 2: collation of updated conceptual ideas and conceptual report/model	Task 2.1 – 2.6	19/03/2021		[redacted]
Task 3: meeting to report conceptual ideas and way forward with numerical model	Task 3.1 – 3.6	26/03/2021	3.5 (conceptual model and way forward with model build)	[redacted]
Task 4: update, development and refinement of the numerical model	Task 4.1 – 4.6 (including all sub tasks)	24/09/2021	4.4.3 (sign off model fit for running scenarios	[redacted]
Task 5: Reporting	Task 5.1 – 5.6	05/11/2021		[redacted]
Task 6: meeting to present results of numerical model	Task 6.1 – 6.2	26/11/2021	6.2 (model fit for purpose)	
Task 7: model handover & signoff	Task 7.1 – 7.2	30/11/2021	7.1 (model files received and end of project)	[redacted]

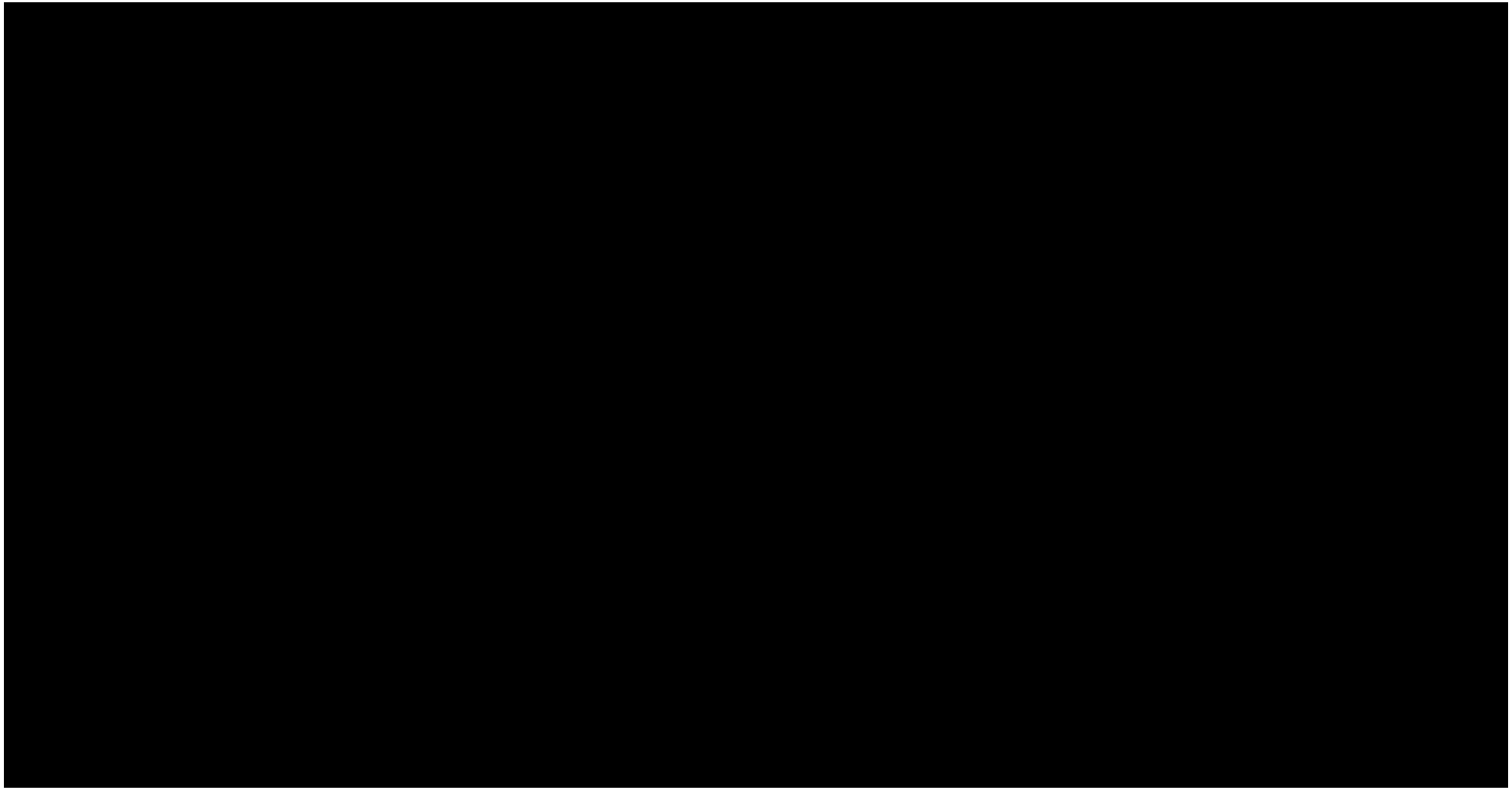


Note: Task 3.1 of the Project Specific Requirements requests inclusion of additional costs for a face to face meeting in the 'additional tasks' table. We have been unable to locate an 'additional tasks' table, but can confirm that there will be no additional costs for face to face meetings, as travel costs are offset by the additional time required to prepare higher resolution outputs for greater clarity in teleconferences.

The below table outlines costs for options which have been priced during the tender phase. These options have not been included in the contract Price but may be utilised by the Environment Agency during the lifetime of the contract, should they be required. This will be discussed and agreed with the Contractor prior to any Variation.

Appendix 4 – Programme

Figure 4a Proposed schedule for delivery of Tasks 1-3, with overall project milestones, deadlines and meetings



Appendix 5 – Change Control

Contract Change Note ("CCN")

CCN Number **Contract Reference Number & Title** **Variation Title** **Number of Pages**	01

WHEREAS the Contractor and the Authority entered into a contract for the (title of contract) dated (date) (the "Original Contract") and now wish to amend the Original Contract

IT IS AGREED as follows

1. The Original Contract shall be amended as set out in this Change Control Notice:

Change Requestor / Originator		
Summary of Change		
Reason for Change		
Revised Contract Price	Original Contract Value	
	Previous Contract Changes	
	Contract Change Note	
	New Contract Value	
Revised Payment Schedule	No change to costing schedule.	
Revised Specification	The specification will change from that drafted in the original contract to the text drafted in the summary section above.	
Revised Contract Period		
Change in Contract Manager(s)	N/A no change to contract manager	
Other Changes	N/A no other changes	

2. Save as amended all other terms of the Original Contract shall remain effective.

3. This CCN takes effect from the date on which both Parties communicate acceptance of its terms via Bravo.

Authorised Authority Representative

Name:

Date: 2020

Defra Commercial Officer
(FSOD Sign off up to £500k)

Name ……

Date……

Authorised Contractor Representative……..

Name……

Date……

Appendix 6 – Data Protection Schedule

Data Protection Schedule

Definitions – the definitions in this Schedule and the Contract shall apply:

Annex 1: the Schedule of Processing, Personal Data and Data Subjects attached to this Data Protection Schedule.

Party: a Party to this Contract.

Data Protection Impact Assessment: an assessment by the Controller of the impact of the envisaged processing on the protection of Personal Data.

Controller, Processor, Data Subject, Personal Data, Personal Data Breach, Data Protection Officer: takes the meaning given in the GDPR.

Data Loss Event: any event that results, or may result, in unauthorised access to Personal Data held by the Processor under this Contract, and/or actual or potential loss and/or destruction of Personal Data in breach of this Contract, including any Personal Data Breach.

Data Subject Request: 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.

Joint Controllers: where two or more Controllers jointly determine the purposes and means of processing. **Protective Measures**: appropriate technical and organisational measures which may include: the use of pseudonyms 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 including those outlined in Annex 1 (Security).

Sub-processor: any third Party appointed to process Personal Data on behalf of the Processor related to this Contract.

1. DATA PROTECTION

1.1 The Parties acknowledge that for the purposes of the Data Protection Legislation, the Agency is the Controller and the Contractor is the Processor unless otherwise specified in Annex 1. The only processing that the Processor is authorised to do is listed in Annex 1 by the Controller and may not be determined by the Processor.

1.2 The Processor shall notify the Controller immediately if it considers that any of the Controller's instructions infringe the Data Protection Legislation.

1.3 The Processor shall provide all reasonable assistance to the Controller in the preparation of any Data Protection Impact Assessment prior to commencing any processing. Such assistance may, at the discretion of the Controller, 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.

1.4 The Processor shall, in relation to any Personal Data processed in connection with its obligations under this Contract:

(a) process that Personal Data only in accordance with Annex 1, unless the Processor is required to do otherwise by Law. If it is so required the Processor shall promptly notify the Controller 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 Controller may reasonably reject (but failure to reject shall not amount to approval by the Controller 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 Contractor Personnel do not process Personal Data except in accordance with this Contract (and in particular Annex 1);

(ii) it takes all reasonable steps to ensure the reliability and integrity of any Contractor Personnel who have access to the Personal Data and ensure that they:

(A) are aware of and comply with the Processor's duties under this clause;

(B) are subject to appropriate confidentiality undertakings with the Processor or any Sub-processor;

(C) 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 Controller or as otherwise permitted by this Contract; and

(D) have undergone adequate training in the use, care, protection and handling of Personal Data; and

(d) not transfer Personal Data outside of the EU unless the prior written consent of the Controller has been obtained and the following conditions are fulfilled:

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

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

(iii) the Processor 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 Controller in meeting its obligations); and

(iv) the Processor complies with any reasonable instructions notified to it in advance by the Controller with respect to the processing of the Personal Data;

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

1.5 Subject to clause 1.6, the Processor shall notify the Controller immediately if 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 in connection with Personal Data processed under this Contract;

(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.

1.6 The Processor's obligation to notify under clause 1.5 shall include the provision of further information to the Controller in phases, as details become available.

1.7 Taking into account the nature of the processing, the Processor shall provide the Controller with full assistance in relation to either Party's obligations under Data Protection Legislation and any complaint, communication or request made under clause 1.5 (and insofar as possible within the timescales reasonably required by the Controller) including by promptly providing:

(a) the Controller with full details and copies of the complaint, communication or request;

(b) such assistance as is reasonably requested by the Controller to enable the Controller to comply with a Data Subject Request within the relevant timescales set out in the Data Protection Legislation;

(c) the Controller, at its request, with any Personal Data it holds in relation to a Data Subject;

(d) assistance as requested by the Controller following any Data Loss Event;

(e) assistance as requested by the Controller with respect to any request from the Information Commissioner's Office, or any consultation by the Controller with the Information Commissioner's Office.

1.8 The Processor shall maintain complete and accurate records and information to demonstrate its compliance with this clause. This requirement does not apply where the Processor employs fewer than 250 staff, unless:

(a) the Controller determines that the processing is not occasional;

(b) the Controller 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 Controller determines that the processing is likely to result in a risk to the rights and freedoms of Data Subjects.

1.9 The Processor shall allow for audits of its Data Processing activity by the Controller or the Controller's designated auditor.

1.10 Each Party shall designate its own data protection officer if required by the Data Protection Legislation.

1.11 Before allowing any Sub-processor to process any Personal Data related to this Contract, the Processor must:

(a) notify the Controller in writing of the intended Sub-processor and processing;

(b) obtain the written consent of the Controller;

(c) enter into a written agreement with the Sub-processor which gives effect to the terms set out in this Schedule such that they apply to the Sub-processor; and

(d) provide the Controller with such information regarding the Sub-processor as the Controller may reasonably require.

1.12 The Processor shall remain fully liable for all acts or omissions of any of its Sub-processors.

1.13 The Controller 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 Contract).

1.14 The Parties agree to take account of any guidance issued by the Information Commissioner's Office. The Controller may on not less than 30 Working Days' notice to the Processor amend this Contract to ensure that it complies with any guidance issued by the Information Commissioner's Office.

1.15 Where the Parties include two or more Joint Controllers as identified in Annex 1 in accordance with GDPR Article 26, those Parties shall enter into a Joint Controller Agreement based on the terms outlined in Annex 2 in replacement of Clauses 1.1-1.14 for the Personal Data under Joint Control.

Annex 1 - Schedule of Processing, Personal Data and Data Subjects Processing, Personal Data and Data Subjects

This Schedule shall be completed by the Controller, who may take account of the view of the Processor, however the final decision as to the content of this Schedule shall be with the Controller at its absolute discretion.

1. The contact details of the Controller's Data Protection Officer are:

[redacted]

Horizon House, Deanery Road, Bristol BS1 5AH

2. The contact details of the Processor's Data Protection Officer are: [redacted]

3. The Processor shall comply with any further written instructions with respect to processing by the Controller.

4. Any such further instructions shall be incorporated into this Annex 1.

Description	Details

Identity of the Controller and Processor	The Parties acknowledge that for the purposes of the Data Protection Legislation, the Agency is the Controller and the Contractor is the Processor in accordance with Clause 1.1.
Subject matter of the processing	No Personal Data is to be collected or stored through the activities of this contract.
Duration of the processing	Not Applicable
Nature and purposes of the processing	None collected
Type of Personal Data being Processed	Not Applicable
Categories of Data Subject	Not Applicable
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	Not Applicable