

Our Ref: MIW/ ENVWLB00445C /RFQ

Your Ref:

Date: 13 August 2021

Dear Sirs

**Contract Ref: ENVWLB00445C**

**Contract Title: Groundwater Hydro-ecology tool**

You are invited to quote for the above in accordance with the enclosed documents.

Instructions on what information we require you to provide is in Section 4 of the following Request for Quotation document.

Your response should be returned to the following email address by midday 20 September 2021 – please include “RFQ GW Hydro-Eco Tool” within the subject title.

Email [mark.whiteman@environment-agency.gov.uk](mailto:mark.whiteman@environment-agency.gov.uk)

Please confirm, by email, receipt of these documents and whether you intend to submit a quote.

If you have any queries, please do not hesitate to contact me.

Yours sincerely

Mark Whiteman

Senior Advisor – Groundwater Resources

E-mail: [mark.whiteman@environment-agency.gov.uk](mailto:mark.whiteman@environment-agency.gov.uk)

Telephone: 020 30 256626

Mobile: 07799 256327

**The Environment Agency**, Foss House, Kings Pool, 1-2 Peasholme Green, York, YO1 7PX

# Request for Quotation

**Ref: ENVWLB00445C**

**Title: Groundwater Hydro-ecology tool**

## Section 1

### Who is the Environment Agency?

We are an Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs. Our principal aims are to protect and improve the environment, and to promote sustainable development.

Further information on our responsibilities, Corporate Plan and how we are structured can be found on our Website.

<https://www.gov.uk/government/organisations/environment-agency/about>

### What do we spend our money on?

We are a major procurer of goods and services within the UK, spending circa £600M per annum, our major spend areas are:

* Flood and Coastal Risk Management (design, construction and maintenance)
* ICT and Telecommunications
* Vehicles and Plant
* Environmental Consultancy and Monitoring
* Temporary Staff and Contractors
* Facilities Management, Energy and Utilities
* Flood Management and Water Related Services

### What do we need from our suppliers?

Suppliers are vital in supporting the delivery of our corporate plan. We aim to support the economy and society whilst delivering more environmental outcomes for every pound we spend. In many areas we are leading the way on environmental and technical developments. It is our role to ensure that suppliers clearly understand our corporate aims and objectives and know that we are committed to delivering the best value most sustainable solutions, taking into account the whole life cost of our procurement decisions. We promote diversity and equality and treat all of our suppliers fairly.

Our procurement strategy may be of interest to you as a potential supplier. It sets out our priorities and key commitments in a range of areas such as delivering our corporate plan, Government policy, supplier management and sustainable procurement:

<https://www.gov.uk/government/organisations/environment-agency/about/procurement#procurement-strategy>

### Government changes and collaboration

Since 1 April 2013, the Environment Agency is no longer responsible for delivering the environmental priorities of Wales. This is now the remit of Natural Resources Wales (NRW).Further information can be found here:

<http://naturalresources.wales/splash?orig=/>

By bidding for this requirement, you may also be approached by other members of the Defra network, NRW or other government departments that are specifically named in the tender document.

### Further information

For further information and to see our commitments to Diversity and Equality, please visit our website.

<https://www.gov.uk/government/organisations/environment-agency/about/procurement>

https://www.gov.uk/government/organisations/environment-agency/about/equality-and-diversity

Also, are you up to date on environmental legislation? See links below for further information.

Waste and Environmental Impact - <https://www.gov.uk/browse/business/waste-environment>

Environmental Regulations - <https://www.gov.uk/browse/business/waste-environment/environmental-regulations>’

## Section 2

### The Customer

### Summary

The Contract will be managed as follows:

Project Sponsor Helen Wakeham, Deputy Director, Water Quality, Groundwater and Land Contamination

Project Executive Paul Sadler, Environment and Business Directorate, Water Resources Assessment Manager

Project Manager Mark Whiteman, Senior Advisor – Groundwater Resources, Environment and Business Directorate, Groundwater team

Contract Manager Mark Whiteman, Senior Advisor – Groundwater Resources, E&B Groundwater

The E&B Groundwater Team is responsible for delivering clean and sustainable groundwater as part of a healthy, rich and diverse environment for present and future generations. The Groundwater Team leads on groundwater quality and groundwater resources across England.

### Contract Length

It is anticipated that this contract will be awarded to one supplier for a period of seven months to end no later than 31 March 2022. Prices will remain fixed for the duration of the contract award period. We may at our sole discretion extend this contract to include related or further work. Any extension shall be agreed in advance of any work commencing and may be subject to further competition. Any amendment to contract prices for the extensions are to be by negotiation.

The Environment Agency Conditions of Contract for Services (Appendix C) shall apply to this contract.

This contract shall be managed on behalf of the Agency byMark Whiteman.

### Contact Details and Timeline

Mark Whiteman will be your contact for any questions linked to the content of the quote pack or the process. Please submit any questions by email and note that both the question and the response will be circulated to all tenderers.

Contact details are:

Email [mark.whiteman@environment-agency.gov.uk](mailto:mark.whiteman@environment-agency.gov.uk)

Tel: 020 30 256626

Mob: 07799 256327

Key elements of the process have been reviewed. Anticipated dates for planned activities are below:

|  |  |
| --- | --- |
| **Activity** | **Due Date** |
| Supplier responses for Request for Quote | 20 September 2021 |
| Evaluation of Request for Quote submissions | 24 September 2021 |
| Award of contract | 1 October 2021 |
| Project/Contract end date | 31 March 2022 |

It should be noted that these timescales and activities may be subject to change.

## Section 3

### Evaluation Criteria

We will award this contract in line with the most economically advantageous tender (MEAT) as set out in the following award criteria:

* Price – 40%
* Quality – 60%

The following quality criteria are weighted in accordance with the importance and relevance attached to each one.

|  |  |
| --- | --- |
| Non Price Criteria | *Weighting* |
| Methodology | 25 |
| Programme of Work to deliver tasks | 10 |
| Skills and Experience in Groundwater modelling, Hydrogeology Hydrology and Hydro-ecology | 25 |
| Previous Experience of hydro-ecology work | 10 |
| Organisational capacity to deliver | 5 |

The criteria listed above will be assessed on a 0 to 10 basis and will reflect the following judgements:

|  |  |
| --- | --- |
| **Rating of Response**  **The tenderer provides a response which in the opinion of the evaluators is:** | **Score** |
| **Excellent:** Addresses all of the requirements and provides a response with relevant supporting information which does not contain any weaknesses, giving the Agency complete confidence that the requirements will be met. | 10 |
| **Very Good:** Addresses all of the requirements and provides a response with relevant supporting information, which contains very minor weaknesses, giving the Agency high confidence that the requirements will be met. | 8 |
| **Good:** Addresses all of the requirements and provides a response with relevant supporting information, which contains minor weaknesses, giving the Agency reasonable confidence that the requirements will be met. | 6 |
| **Satisfactory:** Substantially addresses the requirements and provides a response with relevant supporting information which may contain moderate weaknesses, but gives the Agency some confidence that the requirements will be met. | 4 |
| **Weak:** Partially addresses the requirements, or provides supporting information that is of limited relevance or contains significant weaknesses, and therefore gives the Agency low confidence that the requirements will be met. | 2 |
| **Nil:** No response or provides a response that gives the Agency no confidence that the requirements will be met. | 0 |

## Section 4

### Information to be returned

**Please note, the following information requested must be provided. Incomplete tender submissions may be discounted.**

Please complete and return the following information:

* completed Pricing Schedule (Appendix A);
* completed Prior Rights Schedule (Appendix B);
* confirmation that terms and conditions are accepted (Appendix C. Please note that the terms cannot be amended later).

Within the submission you will need to include:

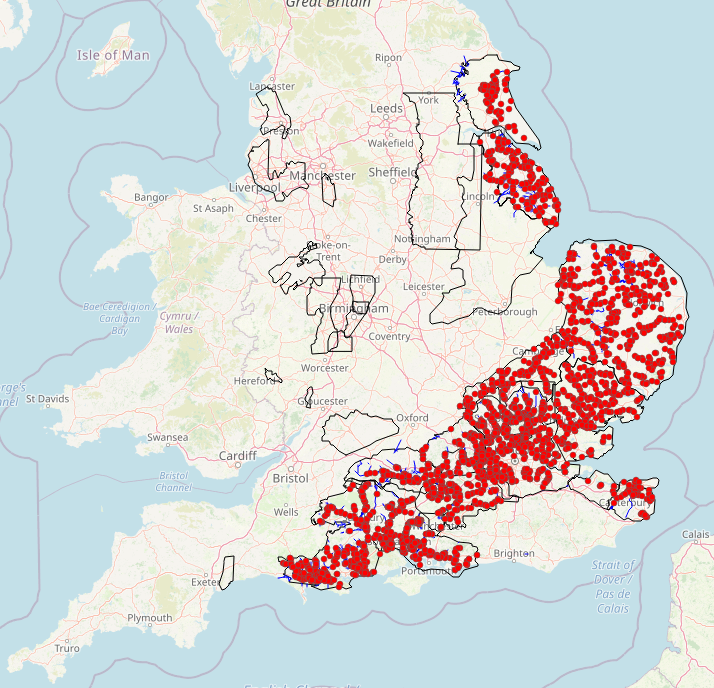
* details of the personnel you are proposing to carry out the service, including CV’s of your key personnel;
* details of how you propose to maintain continuity of personnel;
* details of proposed methodology
* details of how you measure your success in each of the deliverables.
* detail your recent experience of carrying out similar contracts

## Section 5

### Specification

# Background to Requirement

A Groundwater Hydro-ecology tool is required for integration of Hydro-Ecological monitoring data and Groundwater modelling data held by the Environment Agency. The development of this tool will provide consistent flow data outputs from groundwater models to compare to ecology monitoring (see map 1 for extent of ecology monitoring). The tool will produce outputs in a format that can support internal and external communications for both practitioners and senior managers.



**Map 1: location of Environment Agency groundwater models (black outlines) and chalk stream ecology monitoring points (shown in red). Chalk streams are shown in blue.**

**Stage 1** of this project is to prepare consistent total flow outputs from the groundwater models in an accessible format for use with the Environment Agency’s ecology monitoring.

**Stage 2** of the project is to develop hydro-ecological models, in the first place focusing on near-perennial Chalk catchments. The consultant is asked to price for a scoping study in Stage 2, as it is recognised that time and budgets may mean this Stage cannot be completed by March 2022 in the current contract. It is hoped that at least scoping work can be done using case study sites so that any remaining tasks can be costed for a future phase of work.

Currently the Environment Agency’s groundwater models provide flow outputs in a variety of formats which makes it difficult for hydro-ecology specialists to get the modelled flow data they need in a useful output form.

There are many other potential uses of the flow data, such as:

* Linking groundwater drought and surface water response (e.g. Standardised Groundwater Index SGI approach)
* Designing integrated surface water, groundwater and ecology monitoring networks (e.g. through the Defra-funded Natural Capital Ecosystem Assessment programme)
* Understanding the impacts of abstraction on Chalk streams (e.g. at the perennial head or ‘point X’)

This work will help meet the objectives of the Defra 25 Year Environment Plan, primarily ‘Clean and plentiful water’ and mitigation of the impacts of climate change, ‘Thriving plants and wildlife’ and ‘Reducing risks of harm from environmental hazards’ (floods and drought).

The primary objectives are to:

**Stage 1**

1. To review Environment Agency groundwater modelling data and existing tools and methods for processing these.
2. To develop and deliver an easy to use tool to provide consistent data outputs from groundwater models to compare to ecology monitoring.
3. To deliver tools which are needed to help make best use of the output data from 1 and 2. This could run in parallel to objective 4.

And optionally, if timescales and budget permit:

**Stage 2**

1. Carry out a scoping study to build and evaluate a hydro-ecological model for broadly perennial chalk catchments using available data from 1 and 2 and Environment Agency macroinvertebrate monitoring data.

The project approach and outcomes must be consistent with the following project dependencies:

* Any tools developed must be compatible with current and planned Environment Agency computer systems and software.
* The tools developed should be made as future-proof as possible, taking account of developments in groundwater modelling e.g. Modflow6 and the different data formats and systems involved.

# Specific Objectives/Deliverables

**Environment Agency Point of Contact**

Mark Whiteman

Senior Advisor, Groundwater Resources

Environment Agency

Email: [mark.whiteman@environment-agency.gov.uk](mailto:mark.whiteman@environment-agency.gov.uk)

Tel: 020 30256626

Mob: 07799 256327

**Task 1 – Project Management and Start Up Meeting**

**Purpose of task**

Project commencement to confirm the scope and expectations for each Task delivery.

**Task Description**

To undertake project management ensuring delivery to time, cost and quality. This will include:

* a project commencement meeting (likely to be remote by MS Teams) – assume a half day
* monthly project progress meetings (by MS Teams – assume 2 hours per meeting)
* monthly email progress reporting and financial reporting

**Summary Task Products:**

* Consultant to provide summary notes and agreed actions from meetings.
* Consultant to summarise financial progress monthly and submit monthly invoices.

**Task 2 – gather data on existing Environment Agency groundwater models**

**Task Purpose**

The purpose of this task is to gather information on the Environment Agency’s current groundwater models and how each model handles river flow outputs.

**Task Description**

The consultant should work with the Environment Agency’s Project Manager and groundwater model custodians to prepare a list of the current models including but not limited to the following information:

* Model name
* Time Period modelled
* Model timestep
* Date of most recent model update
* Grid size/type (regular/irregular)
* Format of raw river flow outputs
* Post-processing tools available for river flow outputs

The consultant should briefly describe any model set-up assumptions to ensure we are comparing like with like in terms of groundwater model outputs. Of particular interest are the way each model deals with surface water – groundwater interactions such as river leakage and base flow, and whether there is a de-minimus for no flow.

The consultant should share this information with the project team to confirm it is accurate and complete before moving on to the next task.

Table 1 lists the Environment Agency groundwater models which should be considered in scope for this project.

**Table 1: initial list of Environment Agency groundwater models to be included in groundwater hydro-ecology tool project.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Aquifer** | **Model\_name** | **Owner** | **Core\_**  **model\_ Area\_**  **km2** | **Recharge-runoff code** | **Is runoff routed?** | **GW model code** | **Notes** |
| Kidderminster and Bromsgrove Sandstone | Birmingham-Lichfield | Environment Agency | 431 | 4R | Yes | MODFLOW96 | Lichfield and Birmingham are currently separate models |
| Bromsgrove Sandstone | Bromsgrove | Environment Agency | 154 | 4R | Yes | MODFLOW96 |  |
| Chalk | Cam Bedford Ouse | Environment Agency | 2062 | 4R | Yes | MODFLOW96 |  |
| Great Oolite | Cotswold | Environment Agency | 1199 | 4R | Yes | MODFLOW96 |  |
| Gravels | Cotswold Gravels | Environment Agency | 260 | 4R | Yes | MODFLOW96 |  |
| Sherwood Sandstone | East Cheshire | Environment Agency | 165 | EA recharge code | No | MODFLOW96 |  |
| Chalk | East Hampshire Chichester Chalk | Environment Agency | 1057 | 4R | Yes | MODFLOW96 | Model is currently being updated to MF6 and SWaC |
| Chalk and Thanet Sands | East Kent | Environment Agency | 901 | EA recharge code | No | MODFLOW96 |  |
| Sherwood Sandstone | East Midlands Yorkshire | Environment Agency | 3533 | 4R (but not Selby unit) | Yes | MODFLOW96 | Model is currently being updated with recharge model including the Selby unit |
| Bridgnorth, Kidderminster and Bromsgrove Sandstone | East Shropshire | Environment Agency | 632 | 4R | Yes | MODFLOW96 |  |
| Chalk | East Yorkshire Chalk | Environment Agency | 2041 | 4R | Yes | MODFLOW96 |  |
| Chalk | Essex | Environment Agency | 3509 | 4R | Yes | MODFLOW96 |  |
| Sherwood Sandstone | Fylde | Environment Agency | 458 | EA recharge code | No | MODFLOW96 |  |
| Chalk | Herts Chalk | Environment Agency | 2580 | 4R | Yes | MODFLOW96 | There is a plan to convert from Modflow96 to Modflow 6 |
| Chalk | Kennet Valley | Environment Agency | 1219 | EA Catchmod soil moisture code | No | MODFLOW96 |  |
| Lower Greensand | Kent Lower Greensand | Environment Agency | 2010 | 4R | Yes | MODFLOW96 |  |
| Chalk | Lincolnshire Chalk | Environment Agency | 2054 | 4R | Yes | MODFLOW96 |  |
| Jurassic Limestones | Lincolnshire Limestone | Environment Agency | 5204 | 4R | Yes | MODFLOW96 |  |
| Chalk | London Basin | Environment Agency | 2677 | 4R | Yes | MODFLOW96 | Model is currently being rebuilt in 4R6 and Modflow6 |
| Sherwood Sandstone | Lower Mersey Basin | Environment Agency | 833 | EA recharge code | No | MODFLOW96 |  |
| Chalk | Middle Thames | Environment Agency | 1118 | 4R (only Mole part of model) | Yes | MODFLOW96 |  |
| Chalk | Mole | Environment Agency | 1907 | 4R | Yes | MODFLOW96 |  |
| Bromsgrove Sandstone | Newent | Environment Agency | 46 | 4R | Yes | MODFLOW96 |  |
| Chalk and Thanet Sands | North Kent | Environment Agency | 658 | EA recharge code | No | MODFLOW96 |  |
| Chalk | Northern East Anglia Chalk | Environment Agency | 8393 | 4R | Yes | MODFLOW96 |  |
| Otter Sandstone | Otter Valley | Environment Agency | 204 | 4R | Yes | MODFLOW96 |  |
| Chalk | Test-Itchen | Environment Agency | 1595 | 4R6 | Yes | MODFLOW6 |  |
| Fell Sandstone | Till Fell Sandstone | Environment Agency | 191 |  |  |  |  |
| Chalk | Wessex Basin | Environment Agency | 3702 | 4R | Yes | MODFLOW96 | Model currently being re-built in 4R6 and MODFLOW6 |
| Sandstone | West Cumbria | Environment Agency | 170 | EA recharge code | No |  |  |
| Bridgnorth, Kidderminster, Wildmoor and Bromsgrove | West Midlands Worfe | Environment Agency | 911 | 4R | Yes | MODFLOW96 |  |
| Gravels | Yazor Gravels | Environment Agency | 65 | 4R | Yes | MODFLOW96 |  |

**Products of Task**

A spreadsheet table with the required information on the Environment Agency’s current groundwater models, agreed with the Environment Agency’s Project Team.

**Task 3 – provision of groundwater model output to the consultant**

**Task Purpose**

The purpose of this task is for the Environment Agency to provide the required model outputs identified in Task 1 to the consultant for further analysis in subsequent tasks.(Note: this is unlikely to be the total flow post-processed outputs, however where these exist they could be provided for checking against the project outputs).

**Task Description**

The Environment Agency’s Project Manager to arrange appropriate data licence and provide the consultant with the model output identified through Task 1. The Environment Agency Project Manager will work with the EA groundwater model custodians and data licensing team to achieve this.

**Products of Task**

* A data licence for use of the model outputs required for this project.
* A copy of the model outputs delivered to the consultant for use in the remainder of the project.

**Task 4 – Review of existing approaches to provision of groundwater model flow outputs**

**Task Purpose**

To build an understanding of how each of the Environment Agency’s groundwater models handles river flow outputs and consider design of the groundwater hydro-ecology tool.

**Task Description**

Stage 1 of this project is to deliver an easy to use tool to extract total flow from Modflow output and recharge model files for all model cells. This stage requires external consultancy support and we need to establish an agreed budget for this part before considering stage 2 and beyond.

The output from the groundwater hydro-ecology tool needs to be in an easily readable form (probably csv text file), and could cover both the timestep of the groundwater model in question, and also potentially a pseudo-daily timestep as well. The Environment Agency’s hydro-ecologists would like output data in more than one format (e.g. Apache Parquet format) as csv is easy to use and well-understood but is quite slow to manipulate.

The idea would be for this process to initially be run for all current Environment Agency groundwater models, but then to build it into any future model updates, especially where models are created by consultants. The design of the tool should bear this in mind.

Initially the consultant will need to review existing approaches so we can take a decision on the form of a new tool. Issues to consider are:

* Speed
* Ease of use
* Maintainability and configurability
* Likely Environment Agency platform for tool

This will inform a decision on the programming language chosen. Our current preference would be for the code to be in R, and there does already exist a R-modflow package which we have not yet evaluated. But depending on the platform, R may be too slow. Fortran, Python etc are other options.

The consultant should consider any existing post-processing products for providing river flow outputs from the groundwater models, and whether any of these could be developed to produce the groundwater hydro-ecology tool.

There are parallel tasks for the Environment Agency to consider including where the data will reside and how the tool would be run. This should be linked to the Central Modelling Platform transformation work as we are not likely to want to be moving data on and off local laptops to run the tool. Alongside the groundwater hydro-ecology tool output we’d also want the groundwater model modelmaps stored in the same location.

The Environment Agency will also need to consider what else we would like to do with the output data.

The consultant should hold a meeting to discuss initial proposals for development of the groundwater hydro-ecology tool with the Environment Agency’s project team. The meeting is expected to be a short (up to 2 hours) online meeting.

The consultant should allow some time in the programme for end-user testing and review of the hydro-ecology tool.

**Summary Task Products**:

* Listing of existing groundwater models with example model output.
* Initial proposals for groundwater hydro-ecology tool development.

**Task 5 – Develop groundwater hydro-ecology tool code**

**Task Purpose**

The purpose of this task is to develop the code to extract the groundwater model flow outputs in a format for subsequent use in hydroecological models (and other applications).

**Task Description**

Initially the key aim for the consultant is to be able to provide the basic total flow time series (for any available scenario) for any stream cell of any model to support hydroecology modelling. But there are likely other uses of the data, such as calculation of derived statistics, mapping of flows or derived statistics. The Environment Agency’s hydro-ecology team have already made some progress with this using the Hertfordshire Chalk model data.

The consultant should develop the code for extraction of the model flow outputs taking into consideration knowledge gained from the earlier tasks, including any examples of existing flow outputs which have been useful to the hydro-ecology team.

The consultant should provide the Environment Agency project team with a working version of the code, and hold a meeting to present the approach using one or more models as an example of its’ use. The meeting is expected to be a short (up to 2 hours) online meeting.

**Summary Task outcomes:**

* Delivery of post-processing tool to extract the flow data from the groundwater models.
* Presentation of the approach in a short online meeting.

**Task 6 – Develop database of flow data using the groundwater hydro-ecology tool**

**Task Purpose**

The purpose of this task is to develop a database containing the flow outputs from all the Environment Agency’s groundwater models in the format required by the hydro-ecologists, for all the Environment Agency’s current groundwater models.

**Task Description**

Once the consultant has agreed the groundwater hydro-ecology tool is working as expected, the tool should be used by the consultant to extract the flow outputs in the agreed format for all the Environment Agency’s current groundwater models.

The consultant should discuss with the Environment Agency’s project team how the data will be transferred and stored, building on the learning from the earlier tasks.

The groundwater hydro-ecology tool must be capable of being re-run in future, preferably as a routine task during model updates. This will require development of some instructions so that other consultants / EA staff are able to use the tool in future.

The consultant should allow some time in the programme for end-user testing of the database and instructions for use.

The consultant should prepare a short technical note and user guide on the hydro-ecology tool.

**Outputs of task**

* A complete database of the flow outputs from the EA groundwater models ready for use by Agency staff. The database would consist of one or more files in the agreed file formats per EA groundwater model.
* A short technical note and user guide describing the hydro-ecology tool.

**Stage 2: To build and evaluate a hydroecological model for broadly perennial chalk catchments using available data for stage 1 and EA macroinvertebrate monitoring data.**

**Note**: The consultant is asked to price for a scoping study covering the tasks in Stage 2 and comment on whether it is feasible to complete Stage 2 within the current financial year. The Environment Agency may proceed with these tasks if time and budget allows during the current year, or complete them in a future year/do this work in-house.

**Task 7 – To build and evaluate a hydro-ecological model for broadly perennial chalk catchments using available data for stage 1 and EA macroinvertebrate monitoring data.**

**Task Purpose**

The purpose of this task is to use the outputs from the groundwater hydro-ecology tool developed in Stage 1 to develop a hydro-ecological model for broadly perennial chalk catchments.

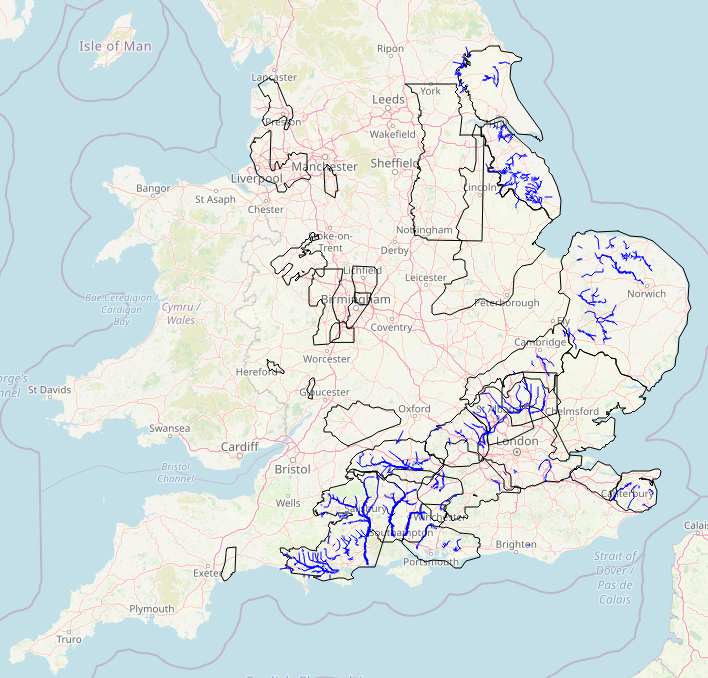
**Task Description**

At this point we assume that the stage 1 tool will already have been run for all our chalk catchment models. Also we assume that we have at the time, a fairly reliable list of chalk streams that’s spatially referenced. This work is ongoing and we would use what is available at the time.

The Environment Agency would need to develop the scope for stage 2 Hydro-ecological modelling during Stage 1 – based on a known remaining budget.

The consultant, in collaboration with the Environment Agency would:

* Identify paired GW model flow / ecology monitoring sites data (see map 1 showing the groundwater models and chalk stream ecology monitoring sites; and map 2 showing location of chalk streams) and would extract flow data from the already generated total flow data files using a process similar to that developed for the Herts Chalk Model.
* Run the data through the [EA Hydroecology Toolkit](https://github.com/APEM-LTD/hetoolkit) to create a paired flow-ecology dataset.
* Take an initial look at the data and use this to tweak the spec.



**Map 2: location of groundwater models and chalk streams**

The consultant, in collaboration with the Environment Agency’s project team should create a dataset of EA macro-invertebrate monitoring data linked to the GW model nodes (based on our open data sources), extracting the modelled flow data, and extracting data from other tools, e.g. RICT model 44 base data. **Note:** macrophyte data is not required, this is for macro-invertebrates only. The main reason for this is that most macrophyte data is collected quite recently and tends not to overlap much with most GW model time periods.

The [EA Ecology & Fish Data Explorer](https://environment.data.gov.uk/ecology/explorer/) contains all the environmental data needed to run RICT2 and there is an excel book for formatting the output from the data explorer into an input file for RICT2.  This RICT2 Data Extraction Template is available from the RICT2 website <https://fba.org.uk/FBA/Public/Discover-and-Learn/Projects/RIVPACS_Landing.aspx>. The consultant should look for the link to the RICT2 Data Extraction Template on the RICT & RIVPACS User Guides page.

The Environment Agency aim is to create a single chalk hydro-ecology model to cover all the broadly perennial parts of all the chalk streams we have groundwater models for. This would use hundreds, possibly thousands of ecology monitoring sites in a single model. The wide spatial scope means that it makes sense to spend some time scoping it as part of this year’s work. We could also include scoping for other geology types as well. Since the hydro-ecological models are very data hungry, the wider the spatial scale the better.

Given this aim, the consultant should scope the development of a chalk GW hydro-ecological model from the data described above to give us a list of tasks for a subsequent year, regardless of whether we choose to contract out or do the work in-house.

If the project needs to be scaled back, an alternative approach could be to select fewer sites as case study examples. The consultant is asked to provide a price per hydro-ecology model area (e.g. 100km2) to facilitate this.

The consultant would then complete the development of the hydro-ecological model for the remaining perennial chalk catchments if time and budget permit.

The Environment Agency would then use the created model in future years to investigate questions such as ‘are all chalk streams the same from a hydro-ecological perspective?’

**Products of task**

A hydro-ecological model for broadly perennial sites in chalk catchments.

A technical note and user guide to the hydro-ecological model.

**Task 8 – develop tools needs to make best use of the output data for Stage 1**

**Task Purpose**

The purpose of this task is to develop any necessary data-processing tools to help make the best use of the outputs created during Stage 1.

**Task Description**

The consultant will create any necessary data-processing tools to support the use of the data created in Stage 1 during development of a hydro-ecological model for chalk streams.

This task can probably be done in parallel with Task 7.

**Products of task**

Data processing tools to support the use of the data either in development of the hydro-ecological model or for other uses identified during the project.

### Timescales/Deadlines

The supplier must provide a GANTT chart (or similar) to demonstrate that the delivery times and milestones for each task can be completed within the whole project timescale.

The whole project must completed by 31 March 2022.

### Skills of Personnel Required

Skills required by the supplier to deliver this project are expected to include:

* Expertise in Hydrogeology, Hydrology and Hydro-ecology.
* Experience in code development for groundwater modelling.
* Demonstrates innovation and creative approaches
* Excellent communication skills (written and verbal)
* Collaborative working and sharing of knowledge

## Section 6

### Contract Management

This contract shall be managed on behalf of the Agency by Mark Whiteman

Email [mark.whiteman@environment-agency.gov.uk](mailto:mark.whiteman@environment-agency.gov.uk)

Tel: 020 30 256626

Mob: 07799 256327

As detailed in the Specification, the contract will be managed through regular MS Teams meetings supported by interim and final reports.

We will raise purchase orders to cover the cost of the services and will issue to the awarded supplier following contract award.

Invoices will be monthly based on work completed.

Before the invoice is issued, a fee note must be emailed in advance to the contract manager for approval. All invoices must quote the purchase order number in order to be processed. A file copy invoice must be provided to the contract manager, on request. The timescale for payment of invoices will be up to 30 days after we have received a valid invoice.

## Section 7

### Sustainability Considerations

We are committed to continually improving our sustainability performance. The Environment Agency has set itself tough objectives as a clear commitment and contribution to sustainable development throughout England. The Agency recognises that this can only be achieved through commitment from all sectors of society and it is intent on raising awareness amongst industry and commerce.

Contractors must adopt a sound proactive environmental approach, designed to minimise harm to the environment.

Environmental criteria should be considered as part of your tender submission with credit given for innovation. Factors to be considered could include areas such as:

* + - Paper use: All documents and reports prepared by consultants and contractors are produced wherever possible on recycled paper containing at least 100% post consumer waste and printed double sided.
    - Travel: use of public transport, reduce face to face meetings by using email and videoconferencing. Meetings to be held in locations to minimise travel and close to public transport links.
    - Packaging: should be kept to a minimum. Re-use and disposal issues must be considered.
    - Efficient Energy and Water Use.
    - Disposal of Waste: Whilst on site the contractor is responsible for the disposal of their own waste and can only use client facilities with express permission from the on site facilities officer.
    - Whilst on site, contractors should comply with the local environmental policy statement which will be made available to you in advance or on arrival.

**Diversity and Equal Opportunities**

We are committed to promoting equality and diversity in all we do and valuing the diversity of our workforce, customers and communities.  As a public body, we publish regular information about what our equality objectives are and how we’re meeting them.

<https://www.gov.uk/government/organisations/environment-agency/about/equality-and-diversity>

**Health and Safety**

Contractors will be responsible for making sure all required health and safety aspects including risk assessments are undertaken and required management measures are in place to protect worker exposure. This includes management of all partners, consortium members and subcontractors.

### IEM2020:

#### Sustainability Objectives

As the Environment Agency, our overarching aim is to protect and improve the environment for people and wildlife. Over the last 10 years we have achieved significant reductions in our environmental impacts that occur through our everyday operations. This included a 40% reduction in our carbon emissions and a 37% reduction in the number of miles we travel. This year we have launched our new Internal Environmental Management strategy to take us through to 2020, building on these successes and widening our ambition.

#### **Supply chain**

Our 2020 approach will have a very strong emphasis on the indirect impacts of our supply chain.

Our supply chain accounts for over 70% of our total environmental impacts.

Working with our supply chain we want to be world class in the area of environmental management. The environmental impacts of our work and that delivered by and through our supply chain must be reduced; environmental risks must be effectively managed and opportunities for enhancements investigated.

As an organisation, our environmental management system (EMS) is accredited to ISO14001 and EMAS standards. Our procurement activities form part of this system; driving environmental performance improvements across the value chain.

## Section 8

### Additional Information

### Copyright and confidentiality

Unless otherwise indicated, the copyright in all of the documentation belongs to the Environment Agency, and the documentation is to be returned to us with your tender. The contents of the documentation must be held in confidence by you and not disclosed to any third party other than is strictly necessary for the purposes of submitting your quote. You must also ensure that a similar obligation of confidentiality is placed upon any third party to whom you may need to disclose any of the documentation for the purposes of the tender.

### Accuracy of documentation

You should check all documentation; should any part be found to be missing or unclear you should immediately contact us at the address given in the covering letter. No liability will be accepted by the Environment Agency for any omission or errors in the documentation which could have been identified by you.

### Amendments to documentation

Prior to the date for return of tenders, we may clarify, amend or add to the documentation. A copy of each instruction will be issued to every Tenderer and shall form part of the documentation. No amendment shall be made to the documentation unless it is the subject of an instruction. The Tenderer shall promptly acknowledge receipt of such instructions.

### Alternative Offers

Alternative offers may be considered if they constitute a fully priced alternative and are submitted in addition to a quotation complying with the requirements of the Invitation to Quote Documents. If, for any reason you wish to submit an alternative offer without a fully compliant tender please contact us in accordance with the details in the covering letter.

### Continuity of personnel

The Contractor shall employ sufficient staff to ensure that the Services are provided at all times and in all respects to the Project Standard. It shall be the duty of the Contractor to ensure that a sufficient reserve of staff is available to ensure project delivery in the event of staff holidays, sickness or voluntary absence

The Environment Agency will be notified immediately of any changes to personnel associated with the project. The Contractor will ensure that every effort is made to replace outgoing staff with personnel of equal calibre and expertise. All new members of staff undertaking work for the Project will need to be agreed by the Environment Agency prior to commencement.

At all times, the Contractor shall only employ in the execution and superintendence of the Contract persons who are suitable and appropriately skilled and experienced.

### Intellectual property rights

All results, including material and tools produced, developed or paid for under this contract shall be the property of the Environment Agency.

### References

The Environment Agency may request recent and relevant references prior to the award of the project.

### Contract award

This Request for Quote is issued in good faith but we reserve the right not to award any or all of this work.

## DATA PROTECTION ACT ADDENDUM TO SPECIFICATION

### Protection of personal data

In order to comply with the Data Protection Act 1998 the Contractor must agree to the following:

* You must only process the personal data in strict accordance with instructions from the Environment Agency.
* You must ensure that all the personal data that we disclose to you or you collect on our behalf under this agreement are kept confidential.
* You must take reasonable steps to ensure the reliability of employees who have access to personal data.
* Only employees who may be required to assist in meeting the obligations under this agreement may have access to the personal data.
* Any disclosure of personal data must be made in confidence and extend only so far as that which is specifically necessary for the purposes of this agreement.
* You must ensure that there are appropriate security measures in place to safeguard against any unauthorised access or unlawful processing or accidental loss, destruction or damage or disclosure of the personal data.
* On termination of this agreement, for whatever reason, the personal data must be returned to us promptly and safely, together with all copies in your possession or control.

# APPENDIX A - PRICING SCHEDULE

ALL COSTS QUOTED MUST BE EXCLUSIVE OF VAT

All costs must be quoted on this schedule. Any costs not detailed will not be paid.

**Staff Costs**

Please detail the day rates of your proposed personnel in the table below.

(Please also advise how many hours you constitute a working day)

Please detail your task costs in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Cost Proposal (To be completed by Supplier)** | | | |
| **Staff Name** | **Daily Rate** | **No of Days** | **Cost** |
| **Task 1 – Project Management and Start Up Meeting** | | | |
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| **Subtotal for Task 1** | |  |  |
| **Task 2 – Gather data on existing Environment Agency groundwater models** | | | |
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| **Subtotal for Task 2** | |  |  |
| **Task 3 – Provision of groundwater model output to the consultant** | | | |
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| **Subtotal for Task 3** | |  |  |
| **Task 4 – Review of existing approaches to provision of groundwater model flow outputs** | | | |
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| **Subtotal for Task 4** | |  |  |
| **Task 5 – Develop groundwater hydro-ecology tool code** | | | |
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| **Subtotal for Task 5** | |  |  |
| **Task 6 – Develop database of flow data using the groundwater hydro-ecology tool** | | | |
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| **Subtotal for Task 6** | |  |  |
| **Task 7 – To build and evaluate a hydro-ecological model for broadly perennial chalk catchments using available data for stage 1 and EA macroinvertebrate monitoring data** | | | |
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| **Subtotal for Task 7** | |  |  |
| **Task 8 – develop tools needs to make best use of the output data for Stage 1** | | | |
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| **Subtotal for Task 8** | |  |  |
| **Total Staff Cost** | | |  |

**Other costs**

Please state any other costs that will need to be taken into consideration.

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| --- | --- |
| **Expenses and Other Costs (To be completed by Supplier)** | |
| **Description** | **Cost** |
| **Task 1 – Project Management and Start Up Meeting** |  |
|  |  |
|  |  |
| **Subtotal for Task 1** |  |
| **Task 2 – Gather data on existing Environment Agency groundwater models** |  |
|  |  |
|  |  |
| **Subtotal for Task 2** |  |
| **Task 3 – Provision of groundwater model output to the consultant** |  |
|  |  |
|  |  |
| **Subtotal for Task 3** |  |
| **Task 4 – Review of existing approaches to provision of groundwater model flow outputs** |  |
|  |  |
|  |  |
| **Subtotal for Task 4** |  |
| **Task 5 – Develop groundwater hydro-ecology tool code** |  |
|  |  |
|  |  |
| **Subtotal for Task 5** |  |
| **Task 6 – Develop database of flow data using the groundwater hydro-ecology tool** |  |
|  |  |
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| **Subtotal for Task 6** |  |
| **Task 7 – To build and evaluate a hydro-ecological model for broadly perennial chalk catchments using available data for stage 1 and EA macroinvertebrate monitoring data** |  |
|  |  |
|  |  |
| **Subtotal for Task 7** |  |
| **Task 8 – develop tools needs to make best use of the output data for Stage 1** |  |
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| **Subtotal for Task 8** |  |
| **Total Expenses and Other Costs** |  |

**Discounts, rebates and reductions**

Please detail below any discounts, rebates and other reductions you are prepared to offer and the basis of those incentives

|  |  |
| --- | --- |
| **Discounts, Rebates and Reductions (To be completed by Supplier)** | |
| **Description** | **Rebate** |
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| **Total Discounts, Rebates and Reductions** |  |

**Total Overall Cost**

Please detail the total fixed cost for the project

|  |  |
| --- | --- |
| **Total Overall Cost (To be completed by Supplier)** | |
| **Total Staff Costs** |  |
| **Total Expenses and Other Costs** |  |
| **Total Discounts, Rebates and Reductions** |  |
| **Total Overall Cost** |  |

The following limits will be applicable to all claims for travel and subsistence under this contract:

1. Travel by rail: standard class should be used at all times
2. Travel by car: 45 pence/mile

Hotel bookings should be made through the Environment Agency’s corporate travel contract. Details of this contract are available from the Corporate Contracting Team.

When making reservations you should state that you are a contractor working on Environment Agency business.

Hotel charges must not exceed a maximum limit per night bed and breakfast (VAT included) of: £140 in London; £100 in Bristol; £90 in Warrington; £85 in Reading; £75 in Aberdeen, Birmingham, Belfast, Cardiff, Coventry, Edinburgh, Glasgow, Harlow, Leeds, Manchester, Middlesbrough, Newcastle, Oxford, Portsmouth, Sheffield and York; and £70 in all other destinations. Please note that these hotel ceiling rates are subject to change throughout the life of the contract.

Expenditure on dinner during an overnight stay must not exceed a maximum limit of £25, including a drink.

Receipts for all rail travel, hotel and food expenses will be required as proof of expenditure and will be reimbursed at cost. No profit or additional cost shall be applied by the contractor to such personal expenses.

# APPENDIX B - PRIOR RIGHTS SCHEDULE

Details of Prior Rights held by the Parties (To be updated as Rights are introduced during the period of the Contract)

Prior Rights owned or lawfully used by a Party, whether under licence or otherwise, which it introduces to the Project for the purposes of fulfilling its obligations under the Contract

Held by the Environment Agency

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| --- | --- | --- |
| **Name and description of Prior Rights** | **Extent of proposed use in the Project** | **Proprietary owner of the Prior Rights** |
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Held by the Contractor

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| **Name and description of Prior Rights** | **Extent of proposed use in the Project** | **Proprietary owner of the Prior Rights** |
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**Explanation of Contractor's Prior Rights**  
All Intellectual Property Rights owned by or lawfully used by the Contractor, whether under licence or otherwise before the date of this Contract. It can also mean any invention and know how or other intellectual property (whether or not patentable) owned by one of the parties prior to the commencement of the Project, or devised or discovered by one of them only in the course of other projects during the Project period and not arising directly from the Project.

# APPENDIX C – ACCEPTANCE OF TERMS AND CONDITIONS

I/We accept in full the terms and conditions named in Section 2 and appended to this Request for Quote document.

Company \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Print Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_