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Department
for Environment
Food & Rural Affairs

Defra Framework Agreement for Air Pollution on Ecosystems and Crops

Lot 5 – Modelling of the impacts of air pollution impacts

ORDER FORM

FROM:

Authority	Defra
Address	Nobel House, 17 Smith Square, London, SW1P 3JR
Contact Ref.	AQ0840
Order Number	AQ0840 (To be quoted on all correspondence relating to this Order) Project title: HQ Thresholds: Establishing critical loads from threshold values for a habitat quality metric for the UK's response to a data request under the Convention on Long-Range Transboundary Air Pollution
Order Date	10 th March 2015

TO:

Supplier	Centre for Ecology and Hydrology,
For attn. of	[REDACTED]
Address	Environment Centre Wales, Dieniol Road, Bangor, Gwynedd, LL57 2UW

1. SERVICE REQUIREMENTS
(1.1) Services and Deliverables Required: refer to Appendix A – Specification of Service
(1.2) Commencement Date: 24th November 2014
(1.3) Completion Date: 31st March 2015
(1.4) Termination of the Contract As per Framework Master Terms & Conditions of Contract

(1.5) Termination on Notice

As per Framework Master Terms & Conditions of Contract

2. PERFORMANCE OF THE SERVICES [AND DELIVERABLES]

(2.1) Key Personnel of the Contractor to be involved in the Services and Deliverables:

As stated in Contractor's EVID2 dated 24th October 2014

(2.2) Service Levels:

As stated in Contractor's EVID2 dated 24th October 2014

(2.3) Location(s) at which Services are to be provided:

Primarily suppliers own premises and other locations as reasonably required from time to time.

(2.4) Contract Monitoring Arrangements:

As stated in Contractor's EVID2 dated 24th October 2014

3. PRICE AND PAYMENTS

(3.1) Contract Price payable by the Authority:

As stated in milestone table. Invoices will be submitted upon satisfactory completion of the milestones.

4. CALL -OFF CONTRACT TERMS AND CONDITIONS

As described within Defra **Air Pollution on Ecosystems and Crops** Framework Agreement Terms and Conditions

5. ADDITIONAL CLAUSES TO BE INCORPORATED INTO THIS CALL-OFF CONTRACT

None

BY SIGNING AND RETURNING THIS ORDER FORM THE CONTRACTOR AGREES to enter into a legally binding Contract with the Authority to provide to the Authority the Services specified in this Order Form incorporating the rights and obligations set out herein and as set out in the Call-Off Contract and the Framework Agreement entered into by the Contractor and the Authority.

For and on behalf of the Contractor:-

Name and Title	[REDACTED]	Research contracts Administrator
Signature	[REDACTED]	
Date	11/03/15	

For and on behalf of the Authority:-

Name and Title	[REDACTED]	CATEGORY MANAGER
Signature	[REDACTED]	
Date	11/03/2015	

Specification of Service

Project description

Under the Convention on Long Range Transboundary Air Pollution (CLRTAP), the UK will be requested by the Coordination Centre for Effects (CCE) to respond to a "Call for Data" by March 2015. The HQThresholds project (AQxxxx) will prepare for this response, developing Critical Load (CL) functions which describe the maximum nitrogen and sulphur deposition compatible with long-term protection of habitats. These functions will be based on acceptable limits for biodiversity, defined using a Habitat Quality Index (HQI) developed in Defra project AQ0828. Habitat specialists from the Statutory Nature Conservation Bodies (SNCBs) were consulted, and agreement was reached that the basis for a biodiversity indicator should be habitat suitability for positive indicator-species. UK results were presented at the 24th CCE Workshop in April 2014, and were instrumental in the decision by the CCE to request all Signatory Parties to provide data based on biodiversity indicator of this type.

Threshold HQI values will be developed, below which a habitat should be considered damaged. Clearly there is more to biodiversity assessment than a binary choice (undamaged versus damaged) on a single axis, but this approach is necessary if biodiversity responses are to be explicitly included in CL modelling and integrated assessment of air pollution impacts. The HQI metric was selected as most clearly related to overall assessments of the quality of habitat examples by the specialists. To determine the most appropriate threshold values, HQI will be calculated for sites with deposition set to the empirical CLs for acidity and nutrient-N. The greater of the two resulting HQI values can also be seen as a good estimate for the threshold. Threshold HQI values will be assessed and a judgement made as to the most suitable value to use. The approach will be illustrated using examples.

The advantage of using threshold HQI values then becomes clear. While empirical critical loads are the best available basis for assessing whether a site will become damaged in the long-term, they are less easy to apply to dynamic situations. For example, how long will a site take to recover when deposition is reduced after the CL was exceeded for many years? Dynamic modelling allows such changes to be simulated, and has been successfully applied, e.g. using pH thresholds, to determine target loads for recovery from acidification. Thresholds for a biodiversity metric will enable direct assessment of the impact of pollution scenarios on policy targets such as "no net loss of biodiversity". The UK response to the Call for Data enabled by this project will be a major contribution to understanding of air pollution impacts and appropriate policy responses.

Objectives

The overall aim of the study is to respond to the UNECE-CCE Call for Data 2014-15, in particular to its Aims a) and b) (see Evidence Background, above).

Specific objectives are:

1. To select habitats and example sites to illustrate the approach.
2. To set up the MADOC-MultiMOVE soil-vegetation model for these sites, by calibrating to current conditions as indicated by abiotic measurements and/or the floristic composition.
3. To run the model forward to equilibrium at S and N deposition rates equivalent to the appropriate critical loads, and thereby establish threshold values for the HQI metric that was operationalised in the AQ0832 project, such that a habitat may be considered damaged below this value and in favourable / recovered condition above it.
4. To determine Critical Load functions, based on combinations of S and N deposition rates, that maintain the HQ metric above the threshold value.
5. To assist the UK National Focal Centre to make a submission to CCE in the Call for Data template, on 23rd March 2015.
6. To describe and justify the approach in a 20-page report to Defra, with a draft to be submitted on 4th March 2015 and a final version on 27th March 2015.
7. To further publicise and disseminate the project and its conclusions.

Approach and methodology

The "Call for Data" deadline is 23rd March 2015, and a submission will be made before the deadline. The format for the response is prescribed. The required response consists, for each site included, of a set of points on a N deposition versus S deposition plot, which together define a critical load function. The project will satisfy the technical requirements of the call, but will also provide evidence to support the CL function – in particular to support the criterion used to define the damage / recovery threshold for the site.

The project will be structured into two Tasks. These are described below, and the main activities under each task are illustrated using a Gantt chart (see attached document, "AQxxxx HQThresholds - dependencies and GANTT chart_260115.docx").

Task 1. Define threshold Habitat Quality values using critical loads.

A key aim for the project is to define threshold values for the Habitat Quality metric, above which the habitat is considered to be in favourable or recovered condition and below which it is considered damaged. These thresholds will be habitat specific, and may also have to be site-specific due to local variation in the species included when calculating the metric. To determine threshold values, a set of example sites will be defined, preferably with species composition data to allow the models to be calibrated, but including some examples without such data to illustrate how the approach could be applied using default data. These sites will be assessed using empirical Critical Loads for acidity and nutrient-N. The MADOC-MultiMOVE model will be calibrated for these sites using floristic and climate data (as was done in the AQ0832 report). The model will then be run forward to equilibrium using deposition at the Critical Load for a) S, b) nutrient-N, and c) both of these Critical Loads, and resultant HQI values calculated. Of these three HQI values, the largest will be taken as the threshold value for HQI, under the precautionary principle. Variation across examples of a single habitat will be used to develop guidance as to where site-specific values are needed. Methods and decisions will be presented in a draft report to be submitted on 4th March.

Task 2 Respond to the Call for Data and report methods and results.

The Project Director will attend a meeting in Westminster to discuss the draft report, on 12th March 2015. Feedback on the draft report will be used to refine methods if necessary, and improve their description.

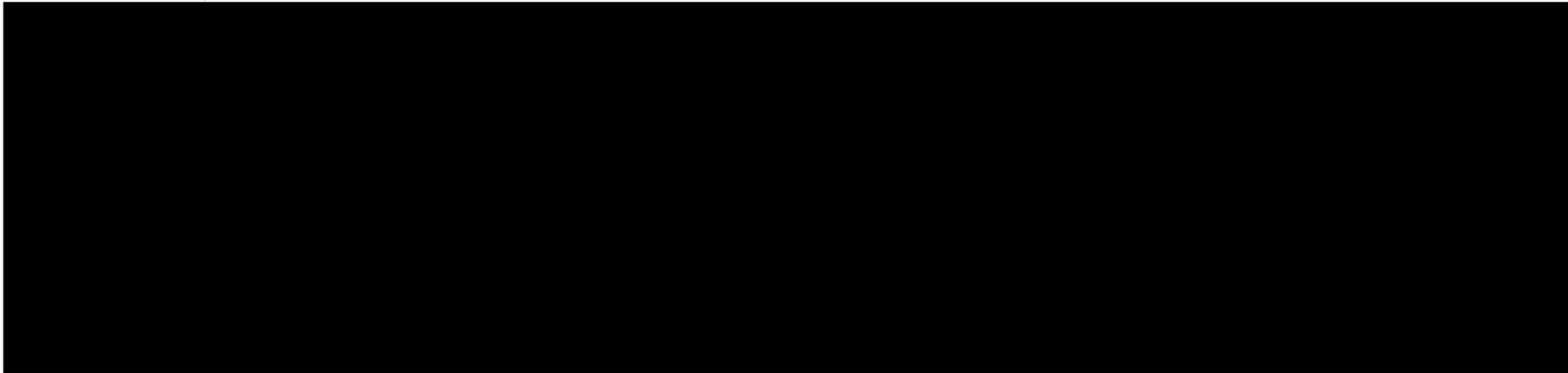
A response to the Call for Data will be prepared in the required template for submission on 23rd March. This will consist of points describing the critical load function for sites representing particular habitats. These points will be determined by modelling responses of the HQ metric to

variation in N and S deposition, using a single threshold value for the HQI metric as determined in Task 1. The critical load function will be defined by the combinations of N and S deposition that result in this threshold HQI value.

The report will be revised according to feedback, and a final version submitted to Defra on 27th March 2015.

Following the CCE Workshop, which this year will be held in Zagreb, 20-22 April, there is usually an opportunity to revise the Call for Data response and re-submit it in early May. If a revised response is made, the project report will be updated to correspond to this response. This work will be undertaken by CEH after the end of the project.

Milestone table



Pricing Schedule

Payments will be made in accordance with the milestones detailed in the Specification of Service

FY 2014/2015 - £ 34,840

TOTAL COST TO DEFRA FOR THIS PROJECT WILL BE £ 34,840

