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By email and post - [REDACTED]

Environment Agency
Iceni House
Cobham Road
Ipswich
Suffolk
IP3 9JD

For Attention of: [REDACTED]

15 December 2014

Our ref: GB/RWB/H2976/00001

Dear Sirs

Consultation Response in connection with Impact of Renewal of two Abstraction Licences (Ludham Road Licence, Renewal Reference 7/34/09/*G/0141C and Plumsgate Road Licence, Renewal Reference 7/34/09/*G0144B) on Catfield Fen (the "Abstraction Licences"))

A. Overview

We write further to our previous correspondence in this matter, on behalf of our clients Mr and Mrs Harris. This letter also represents a formal consultation response, on behalf of our clients, to the Environment Agency's "minded to" decision with respect to extension of the Abstraction Licences dated 17 November 2014. While our clients welcome the Environment Agency's conclusion that the abstraction licenses should not be renewed, the evidence clearly demonstrates that harm to Catfield Fen (the "Fen") cannot be excluded in accordance with the precautionary principle and a refusal is required on this basis (as well as the harm to Snipe Marsh).

B. Expert reports

Please find enclosed the following documents which have been prepared by the team of pre-eminent independent experts instructed by our clients:

- Report by Dr Chris Bradley, Senior Lecturer in the School of Geography, Earth and Environmental Sciences at the University of Birmingham, entitled "Catfield Renewals".
- Report by Professor David Gilvear, Head of the Catchment and River Science Research Group at Plymouth University.
- Two reports by Dr Jo Parmenter, Director of The Landscape Partnership (one being an Ecological Summary and the other an analysis of the Schedule of Documents accompanying the Agency's "minded to" decision).

Letter of response to Minded to Consultation: 79031534_2

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- Report by Erin Pyne and Dr. Aat Barendregt from Utrecht University dealing with Characterization of the Relationship between Hydrology and Vegetation in Catfield Fen.

These reports clearly provide overwhelming justification to support cessation of abstraction pursuant to the Abstraction Licences. The key points coming out of these reports are set out below, although we think it is imperative that the Environment Agency reviews the enclosed paperwork in detail and comes to its final decision having fully taken the relevant expert analysis into account.

C. Key expert points

1. Failings with the Agency's hydrogeological model (the "**Model**")

1.1. Conceptual issues

- The Model focuses on hydrogeology only, and not hydrology or hydroecology. It is vital to consider what is happening in the rooting zone itself, not theoretical changes in water levels based on incorrect and unsubstantiated assumptions against a modelled baseline unrelated to the rooting zone;
- The Model has been developed for application at a catchment scale and cannot deliver at a sufficiently fine scale to interpret local ecological implications; and
- There is a failure to link the hydrology with the ecology (see section 2 for further comment in this respect).

1.2. Lack of Scientific Validity

In its application of the Model, the Agency has failed to follow not only its own recommendations (Rushton 2014) but also international best practice (Anderson and Woessner 1992), leading to a set of questionable assumptions with no understanding of the margin of error. For example, the following failures have been identified:

- A failure to quantify sensitivities;
- Absence of statement of error;
- Lack of a conceptual model;
- Unreliable and inadequate calibration owing to lack of adequate fieldwork;
- Use of unrealistic parameters to yield meaningful results, for example a specific yield of 0.8;
- Individual Model Cell size of 40,000m² which is significantly too large for the microenvironment of the Fen;
- An inability to include properly important variables such as water chemistry and soil moisture into the fundamental analysis undertaken by the Model;



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- Failure to grant third party access to the Model and its operators; and
- Inadequate response by van Wonderen (2014), a member of the Model Advisory Group, to substantial and informed scientific criticism. He merely asserts the Model is “acceptable”.

2. Ecological and Ecohydrological Issues

- The Ecohydrological Guidelines, the supposed link between the hydrology and ecology, are both misunderstood and misinterpreted.
- We accept that management is an issue that should be considered by the Agency. However, the Agency's comments on fen management (see, for example: Amec paper 8 2014e; Dr. Parmenter & Riches' paper 110; and subsequent correspondence) are ill-informed, inaccurate and unscientific. Natural England has concluded that Unit 11 is well-managed in accordance with its management prescriptions under the Higher Level Stewardship Scheme.
- The Agency's comments on Natural England's Condition Assessment fail to recognise the mechanism's acknowledged weaknesses as a diagnostic tool for vegetation change. The comment on page 12 of the Determination Report that Natural England's 2013 Condition Assessment of Unit 11 showed “improvement” is simply misleading and reveals a failure to understand the issues involved.
- After the recent submissions by Dr. Parmenter and the RSPB, Natural England now categorises Unit 3 as in “unfavourable declining” condition. The original Condition Assessment failed to identify the remarkable growth of sphagnum occurring on the site and the fact that it endangered the UK's largest population of the fen orchid, one of the UK's rarest plants.
- The impact of changes in the water chemistry on invertebrates is not considered.
- The Agency was never refused access to the Fen as claimed in its “minded to” decision. In fact, access was granted for various works, including modifications/repairs to existing piezometers; ecological fieldwork by Dr Bryan Wheeler and use of water level monitoring installations.
- That acidification caused by a change in the water balance between rainwater and groundwater is the best explanation of the acknowledged vegetation change on the ground. This is strongly supported by new research (see section 3 for more details in this regard).

3. New Research

3.1. Barendregt/Pyne (Utrecht University)

- The new work by Dr. Barendregt and Pyne (enclosed) and the RSPB strongly supports the contention that acidification caused by a change in water balance between rainwater and groundwater is the probable cause of the remarkable vegetation change now acknowledged on the Fen. There is a failure by the Agency to recognise this point, and no consideration of recent material published on this subject internationally, particularly in the Netherlands.



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- The Barendregt/Pyne research specifically also links the vegetation on Middle Marsh with the underlying hydrology. It confirms the presence and vital influence of groundwater for the health of the Fen. It also demonstrates a microenvironment of 5/10m² both in terms of ecology and hydrology. This is totally at variance with the Agency's use of a cell size of 40,000m² for analysis using its Model. For example, the Agency's model cell H covers a much larger area, including all of Middle Marsh and all of North Marsh (south and north). This is reiterated by Professor Rushton (2014).

3.2. RSPB pH research

- This study confirms that the Butterfly Land has experienced a sharp decrease in pH of circa 2 pH units, i.e. has significantly moved towards greater acidification over the last 25 years. This again confirms that accelerated succession is leading to vegetation change and also demonstrates that the Agency's high-level predictions of pH change using its Model are seriously flawed both in approach and end result. This is also confirmed by the independent expert Professor Rushton.

3.3. Gilvear (Plymouth University)

- This paper shows the maximum loss of water to the Fen in terms of water equivalent depth over 30 days as 8.7cm from groundwater abstraction. It is not intended as an actual forecast but demonstrates a number of key factors in particular:
 - the smallness of the groundwater catchment area as compared to the Fen;
 - the sensitivity of the figures to the assumptions made, for example to porosity; and
 - the scale of the numbers involved.
- There is no equivalent analysis in the Agency's analysis which focuses almost exclusively on the Model about which the supporting papers confirm our view that there are serious reservations as to its scientific validity and appropriateness in the small scale environment of the Broad.

D. Requirements for Environment Agency action

Our expectation remains that the Environment Agency's final decision on renewal of the Abstraction Licences must be made by 14 February 2015. As made clear in our previous letters, it would not be acceptable for the Agency to extend its decision-making process beyond this previously-agreed timetable.

Our clients desisted from issuing judicial review proceedings in October 2014 purely on the basis of the Agency's assurances that the timetable would not be extended. It remains the case that the length of time that the applications have taken to get to this point is unreasonable, unacceptable and unlawful. This is particularly stark, given the need to urgently protect the Fen from further irreparable damage. We therefore reiterate that 14 February 2015 **must** be the final stage in the decision-making process, and we require the Agency to confirm that no further extensions of time will be permitted. If a further extension is suggested, our clients will proceed to issue judicial review proceedings, based on the grounds set out in our letter before action dated 15 October 2014.



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We require the Agency specifically to consider *and* reach conclusions on each of the technical points set out above in its final decision on the future of the Abstraction Licences, even if the conclusion is that the points introduce scientific doubt that cannot be resolved within the time-table for the final decision. The Agency has of course had several years to consider the impact of abstraction on the Fen. If, by 14 February 2015, the Agency has not been able to exclude the possibility of harm to the Fen in accordance with the precautionary principle, then it is clear that the licences should be refused on this basis, as well as on the basis of impacts on Snipe Marsh. There can be no justification for any further delay, and we note that your own conclusions accept that even temporary abstraction would be unacceptable. Given the potential for delay to cause further irretrievable damage to the Fen, the existence of any uncertainty arising from the points raised by our client's submissions adds weight to the need to refuse the licences without further deferral. This can be the only lawful action, given the impact of the precautionary principle. We are advised that a Court would reach similar conclusions.

We look forward to hearing from you.

Please acknowledge receipt of this letter.

Yours faithfully

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