Nitrate vulnerable zone designation (NVZ) 2017 Eutrophic waters (Lakes)

There are multiple waterbodies in this NVZ, please use the bookmarks on the left toolbar to navigate between waterbodies
Nitrate Vulnerable Zone (NVZ) designation, 2017 Eutrophication (lakes)

Publication Date: June 2016

NVZ Name: Attenborough Nature Reserve NVZ (Beeston Pond)
NVZ ID: EL149
Evidence of eutrophication 2017

This document provides a summary of the evidence used in proposing an area of land as one which should be, or should continue to be, designated as a Nitrate Vulnerable Zone (NVZ) for the purposes of the Nitrate Pollution Prevention Regulations 2015.

A full description of the methods used in developing the NVZ proposals is set out in the detailed methodology for eutrophication-related NVZs, available via http://apps.environment-agency.gov.uk/wiyby/141443.aspx. These methods were developed under the guidance of a review group convened by the Defra for the last NVZ review (2011-2013), which included representatives from the farming and water industries as well as independent academic experts. Minor refinements to the methods have been made for the current review.

NVZs are areas of land that drain to polluted waters and which contribute to the pollution of those waters. Polluted waters include those which are eutrophic or may in the near future become so if the Regulations were not to apply there.

Eutrophication is defined as "the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned".

For both freshwaters and saline waters, a weight-of-evidence based approach to assessing the risks and impacts of eutrophication was employed. The evidence for individual water bodies was assessed against a national suite of criteria for eutrophication in the different categories/types of water for review. The criteria are both quantitative and qualitative and reflect scientific understanding of the process and effects of eutrophication. They are broken down in the same way for each water category as follows:

- Nutrients
- Plants/algae
- Secondary and other effects

For each designated or candidate water body which might meet the criteria for eutrophication, a datasheet such as this one was completed, bringing together information about the water body, its catchment, its uses, evidence of eutrophication and the sources of nitrogen input.

This document is a record of the evidence used in the designation process, including results from national monitoring and assessment programmes, and further information supplied by Area staff. The proposals for NVZ designation are made as a result of close working between Area and national Environment Agency teams, with further quality assurance for the eutrophication designations through the use of a national expert panel.

An accompanying guide to these datasheets is available, which provides an explanation of the contents, acronyms and technical terms.

Some features of the maps within this report are based on digital spatial data licensed from the Centre for Ecology and Hydrology, ©.

Please note that any maps shown here have not used detailed field boundaries and therefore represent the indicative 'soft' boundary only. The definitive NVZ area can be seen on the "What's in Your Backyard" (WIYBY) website (http://apps.environment-agency.gov.uk/wiyby/141443.aspx).

NVZ Name: Attenborough Nature Reserve NVZ (Beeston Pond)
NVZ ID: EL149
Section 1. Lake and catchment characteristics

WB ID: 34977  2013 NVZ status: Not Designated

Lake attributes

<table>
<thead>
<tr>
<th>EA Area</th>
<th>Derbyshire Nottinghamshire and Leicestershire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake grid co-ordinates (Easting/Northing)</td>
<td>452935 / 335505</td>
</tr>
<tr>
<td>Lake waterbody area (ha)</td>
<td>9.4</td>
</tr>
<tr>
<td>WFD Lake Typology</td>
<td>High alkalinity, very shallow, very small, lowland</td>
</tr>
<tr>
<td>Lake Alkalinity (ueq/L)</td>
<td>3517</td>
</tr>
<tr>
<td>Mean lake depth (m)</td>
<td>1.5</td>
</tr>
<tr>
<td>Is the lake heavily modified according to WFD?</td>
<td>No data</td>
</tr>
<tr>
<td>Does stratification occur?</td>
<td>Well mixed</td>
</tr>
<tr>
<td>Is this waterbody a reservoir?</td>
<td>No</td>
</tr>
</tbody>
</table>

Natural or artificial lake: Artificial

Type of artificial lake: Gravel pit

Lake perimeter (% artificial) <20%

Significant changes in lake level due to seasonal drawdown: N

Pumped storage or other reservoir: n/a

Information on abstraction (if available)
## Lake catchment attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake catchment area (ha)</td>
<td>19920</td>
</tr>
<tr>
<td>If pumped, pumped catchment area (ha)</td>
<td></td>
</tr>
</tbody>
</table>

### Hydrological character

Ground and surface water --- From superficial sands and gravels. No data for groundwater nitrate component but possibly from surrounding urban source.

Please note that the map above has not used the detailed field boundaries and is the indicative 'soft' boundary. The definitive NVZ area can be seen on the Environment Agency website (www.environment-agency.gov.uk).

**Comments on accuracy of lake catchment:**

**Is the map representative of the natural catchment?**

n/a

**Is the map representative of the artificial catchment?**

Yes
Section II - Waterbody uses

Water Supply:
Controlled water (Section 104 of Water Resources Act):
Yes

Public Water Supply:
No

Drinking Water Protected Area:
No

UWWTD designation
Yes --- The river Erewash is a SA(e) river which flows through the pits. (DB)

Used for hydropower or flow regulation:
n/a

Recreational use:
Accessiblity to public:
Easily accessible, many visits

Recreational fishing:
No activity

Contact watersports
No activity

Nature of watersports (if applicable):
---

Other public benefit visits:
Significant benefit- Nature reserve, so walkers, cyclists, bird watchers

Conservation status:
Conservation value of lake:
National

Habitats Directive site:
Not SPA or SAC --- SSSI

SPA or SAC for aquatic interest features
n/a ---

SSSI or local conservation designation:
SSSI --- & Nature Reserve

Description of Aquatic interest features:
--- Notable Features of the SSSI as a Whole:
Aggregations of non-breeding birds - Bittern, Botaurus stellaris; Aggregations of non-breeding birds - Shoveler, Anas clypeata; Assemblages of breeding birds - Lowland open waters and their margins; MG4 - Alopecurus pratensis - Sanguisorba officinalis grassland; Standing waters: W6 - Alnus glutinosa - Urtica dioica woodland; Habitat Types Represented: Open Standing Water Fen, marsh and swamp Carr woodland; Wet Woodland; Lowland Meadows; Coneries Unit Features; Aggregations of non-breeding birds - shoveler; Assemblages of breeding birds - lowland open waters and their margins; Eutrophic Lakes; In addition the citation list various species within it

NVZ Name: Attenborough Nature Reserve NVZ (Beeston Pond)
NVZ ID: EL149
## Total oxidised nitrogen (TON) data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean summer TON (mg/l)</td>
<td>3.6</td>
</tr>
<tr>
<td>Total number of summer TON samples</td>
<td>17</td>
</tr>
<tr>
<td>75th percentile annual TON (mg/l)</td>
<td>6.6</td>
</tr>
<tr>
<td>Total number of TON samples</td>
<td>64</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 1 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 2 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Date range of TON samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

### TON monitoring data

![Graph showing TON mg/l over time](chart.png)

**Sample Date**

- 18/04/2010
- 18/07/2010
- 18/10/2010
- 18/01/2011
- 18/04/2011
- 18/07/2011
- 18/10/2011
- 18/01/2012
- 18/04/2012
- 18/07/2012
- 18/10/2012
- 18/01/2013
- 18/04/2013
- 18/07/2013
- 18/10/2013
- 18/01/2014
- 18/04/2014
- 18/07/2014
- 18/10/2014

**NVZ Name:** Attenborough Nature Reserve NVZ (Beeston Pond)

**NVZ ID:** EL149
Total nitrogen (TN) data

<table>
<thead>
<tr>
<th>Mean annual TN (mg/l)</th>
<th>5.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of TN samples</td>
<td>62</td>
</tr>
<tr>
<td>Confidence of annual mean TN exceeding 1 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Confidence of annual mean TN exceeding 2 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Date range of TN samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

TN monitoring data

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient nitrogen?

Strengthens
Total phosphorus (TP) data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual geometric mean TP (ug/l)</td>
<td>316</td>
</tr>
<tr>
<td>WFD face value TP class</td>
<td>Bad</td>
</tr>
<tr>
<td>Confidence of moderate or worse TP status</td>
<td>100%</td>
</tr>
<tr>
<td>Date range of TP samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

TP monitoring data

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient phosphorus?

Strengthens
Nitrogen loading estimates based on catchment map area

<table>
<thead>
<tr>
<th>Source</th>
<th>Leached N (kgN/yr)</th>
<th>Conc. (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From all agricultural sources</td>
<td>260869</td>
<td>5.6</td>
</tr>
<tr>
<td>From agricultural sources minus atmospheric deposition</td>
<td>232580</td>
<td>No data</td>
</tr>
<tr>
<td>From urban sources</td>
<td>237632</td>
<td>5.1</td>
</tr>
<tr>
<td>From all sources</td>
<td>498501</td>
<td>10.7</td>
</tr>
<tr>
<td>From all sources (minus atmospheric deposition)</td>
<td>470212</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Ranking based on nitrogen loading from agricultural sources 56

Local assessment 2015

Significance of loading from agricultural sources to the catchment of the lake

Minor source

Significance of loading from human habitation to the catchment of the lake

Principal source --- Point source (DB)

Significance of any other sources of nutrient loading to the lake or its catchment

NVZ Name: Attenborough Nature Reserve NVZ (Beeston Pond)
NVZ ID: EL149
### Chlorophyll data

<table>
<thead>
<tr>
<th>Annual mean Chlorophyll (ug/l)</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>total number of Chlorophyll samples</td>
<td>32</td>
</tr>
<tr>
<td>WFD face value Chlorophyll class</td>
<td>Moderate</td>
</tr>
<tr>
<td>Confidence of moderate or worse status</td>
<td>98%</td>
</tr>
<tr>
<td>Chlorophyll Good/Moderate boundary value</td>
<td>20</td>
</tr>
<tr>
<td>Date range of Chlorophyll samples</td>
<td>2010-2014</td>
</tr>
</tbody>
</table>

#### Chlorophyll monitoring data

![Chlorophyll monitoring data graph](image)

**Sample date:**
- 18/04/2010
- 18/07/2010
- 18/10/2010
- 18/01/2011
- 18/04/2011
- 18/07/2011
- 18/10/2011
- 18/01/2012
- 18/04/2012
- 18/07/2012
- 18/10/2012
- 18/01/2013
- 18/04/2013
- 18/07/2013
- 18/10/2013
- 18/01/2014
- 18/04/2014
- 18/07/2014
- 18/10/2014

**Chlorophyll ug/l**
- 0
- 20
- 40
- 60
- 80
- 100
- 120
- 140
- 160

**Date range of Chlorophyll samples:**
- 2010-2014

---

**NVZ Name:** Attenborough Nature Reserve NVZ (Beeston Pond)

**NVZ ID:** EL149
**Other responses**

<table>
<thead>
<tr>
<th></th>
<th>Phytoplankton (Pluto EQR)</th>
<th>Macrophytes (EQR)</th>
<th>Diatoms (EQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQR</strong></td>
<td>0.19</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Total number of samples/surveys</strong></td>
<td>16</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td><strong>WFD face value class</strong></td>
<td>Poor</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Confidence of moderate or worse status</strong></td>
<td>100%</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Date range of samples</strong></td>
<td>2011-2013</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Number of years when algal blooms were observed based on reactive monitoring 2010-2015: 0

Does any other (e.g. EA non-WFD, or third party monitoring data for the lake provide improved evidence of eutrophication? (local judgement)
Strengthens evidence

To which biological element(s) does it relate?
More than one (describe) ---

**Palaeolimnology**

<table>
<thead>
<tr>
<th></th>
<th>No data</th>
<th>No data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change as Square Chord Distance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Change in Diatom community</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evidence that designated aquatic interest features associated with the lake show evidence of eutrophic disturbance? (local judgement)
Likely to be affected

Strength of evidence (local judgement)
Strong evidence ---

Local judgement on the evidence of eutrophic disturbance
Y, definitely

---

**NVZ Name:** Attenborough Nature Reserve NVZ (Beeston Pond)

**NVZ ID:** EL149
Comments and decisions

WFD Weight of evidence for eutrophication:

<table>
<thead>
<tr>
<th>Certainty of eutrophication problem based on core WFD tools:</th>
<th>Very certain eutrophication problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certainty of eutrophication problem based on overall weight of evidence:</td>
<td>Very certain eutrophication problem</td>
</tr>
<tr>
<td>WFD overall ecological status :</td>
<td>Poor</td>
</tr>
<tr>
<td>Confidence in WFD status :</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>

Current assessment of weight of evidence supporting designation in 2017

First national panel

Recommended action : Needs further investigation

Comments from first panel:
All 3 lakes at Attenborough should probably be considered together unless there is any evidence of differing water sources. Question whether direct connection with the R Trent, or whether other inputs occur, and whether any significant point sources having relatively direct influence.

Second national panel

Comments from second national panel:
Reference to University of Nottingham work on these sites. 2001 UCL report on restoration targets, included palaeolimnological study showing significant change (Sayer C.D. & Roberts N. (2001) Establishing realistic restoration targets for nutrient-enriched shallow lakes: linking diatom ecology and palaeoecology at the Attenborough Ponds, U.K. Hydrobiologia 448: 117–142.). Some discussion of whether all 3 lakes have same water sources as one may be isolated, but water chemistry data indicates they are all highly enriched with N, so should be considered together. Still a need to clarify the point source contributions to the River Erewash - recent work by ADAS for Defra WQ0223 project (SEPARATE source apportionment model for P and N) confirms agricultural contribution is significant enough for designation to be supported.

Recommendation: Designate

Local summary and recommendation:
Notwithstanding that this lake is already situated within a Nitrate Vulnerable Zone, we feel there is sufficient enough strong and relevant evidence to support the case for having it designated as a Polluted Water (Eutrophic) under the Nitrate Directive.

NVZ Name: Attenborough Nature Reserve NVZ (Beeston Pond)
NVZ ID: EL149
Lake Description:
Attenborough comprises a series of disused gravel pits excavated between 1929 and 1967. It is a high alkalinity, shallow well mixed lake. Attenborough Gravel Pits SSSI is a nationally important site for its lowland eutrophic open waters with emergent vegetation, wet floodplain woodland, unimproved floodplain grassland. Although connected to the R Erewash, the water levels in the gravel pits are largely maintained by groundwater levels and direct rainfall input. The site consists of two main bodies of water (for WFD monitoring and reporting purposes) that each have their own monitoring.

Why the lake should be designated as a Polluted Water (eutrophic):
The proposed Attenborough Nature Reserve NVZ lies within an existing surface water NVZ. The catchment does have inputs from a number of different sources, but agriculture is responsible for almost 50% of the nitrogen load entering the site. Reduction of input from agriculture would therefore be a significant factor.

Nitrogen:
75th percentile TON and annual mean TN values are significantly above the 2 mg/l threshold at 6.6 and 5.7 mg/l respectively.

Phosphorus:
The WFD classification for total phosphorus is Bad status.

Ecological response:
Chlorophyll and overall phytoplankton are classed as Moderate for WFD. Local judgement indicates that aquatic interest features associated with the lake show strong evidence of eutrophic disturbance. There are no macrophyte surveys for Beeston Pond but surveys in the associated lakes show macrophytes to be in Poor status for WFD.

Supplementary evidence:
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enquiries@environment-agency.gov.uk

or visit our website
www.gov.uk/environment-agency

incident hotline 0800 807060 (24 hours)
floodline 0345 988 1188 / 0845 988 1188 (24 hours)

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Nitrate Vulnerable Zone (NVZ) designation, 2017 Eutrophication (lakes)

Publication Date: June 2016

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)
NVZ ID: EL149
This document provides a summary of the evidence used in proposing an area of land as one which should be, or should continue to be, designated as a Nitrate Vulnerable Zone (NVZ) for the purposes of the Nitrate Pollution Prevention Regulations 2015.

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NVZs are areas of land that drain to polluted waters and which contribute to the pollution of those waters. Polluted waters include those which are eutrophic or may in the near future become so if the Regulations were not to apply there.

Eutrophication is defined as “the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned.”

For both freshwaters and saline waters, a weight-of-evidence based approach to assessing the risks and impacts of eutrophication was employed. The evidence for individual water bodies was assessed against a national suite of criteria for eutrophication in the different categories/types of water for review. The criteria are both quantitative and qualitative and reflect scientific understanding of the process and effects of eutrophication. They are broken down in the same way for each water category as follows:-

- Nutrients
- Plants/algae
- Secondary and other effects

For each designated or candidate water body which might meet the criteria for eutrophication, a datasheet such as this one was completed, bringing together information about the water body, its catchment, its uses, evidence of eutrophication and the sources of nitrogen input.

This document is a record of the evidence used in the designation process, including results from national monitoring and assessment programmes, and further information supplied by Area staff. The proposals for NVZ designation are made as a result of close working between Area and national Environment Agency teams, with further quality assurance for the eutrophication designations through the use of a national expert panel.

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NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)  
NVZ ID: EL149
## Section 1. Lake and catchment characteristics

**WB ID:** 35060  
**2013 NVZ status:** Not Designated

### Lake attributes

<table>
<thead>
<tr>
<th>EA Area</th>
<th>Derbyshire Nottinghamshire and Leicestershire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake grid co-ordinates (Easting/Northing)</td>
<td>451262 / 333459</td>
</tr>
<tr>
<td>Lake waterbody area (ha)</td>
<td>57.8</td>
</tr>
<tr>
<td>WFD Lake Typology</td>
<td>High alkalinity, very shallow, large, lowland</td>
</tr>
<tr>
<td>Lake Alkalinity (ueq/L)</td>
<td>3632</td>
</tr>
<tr>
<td>Mean lake depth (m)</td>
<td>1.7</td>
</tr>
<tr>
<td>Is the lake heavily modified according to WFD?</td>
<td>No data</td>
</tr>
<tr>
<td>Does stratification occur?</td>
<td>Well mixed</td>
</tr>
<tr>
<td>Is this waterbody a reservoir?</td>
<td>No</td>
</tr>
</tbody>
</table>

**Natural or artificial lake:**
Artificial --- Historically connected to River Erewash, however major flood defence works may change the continuity. They are not operated for any water supply or industrial use.

**Type of artificial lake:**
Gravel pit --- The reserve was established in 1966. It comprises a series of disused gravel pits excavated between 1929 and 1967.

**Lake perimeter (% artificial)**
>80% (A wide range of aquatic and waterside habitats. Between the ponds are drier areas of scrub and grassland as well as areas of native willow and old stream courses.)

**Significant changes in lake level due to seasonal drawdown:**
N

**Pumped storage or other reservoir:**
n/a

**Information on abstraction (if available)**
Lake catchment attributes

<table>
<thead>
<tr>
<th></th>
<th>19920</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake catchment area (ha)</td>
<td></td>
</tr>
<tr>
<td>If pumped, pumped catchment area (ha)</td>
<td></td>
</tr>
</tbody>
</table>

Hydrological character

Ground and surface water --- From superficial sands and gravels. No data for groundwater nitrate - uncertain of contribution

Please note that the map above has not used the detailed field boundaries and is the indicative 'soft' boundary. The definitive NVZ area can be seen on the Environment Agency website (www.environment-agency.gov.uk)

Comments on accuracy of lake catchment:

Is the map representative of the natural catchment?

n/a

Is the map representative of the artificial catchment?

Yes

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)
NVZ ID: EL149
**Section II - Waterbody uses**

**Water Supply:**

**Controlled water (Section 104 of Water Resources Act):**

Yes

**Public Water Supply:**

No

**Drinking Water Protected Area:**

No

**UWWTD designation**

Yes --- The river Erewash is a SA(e) river which flows through the pits. (DB)

**Used for hydropower or flow regulation:**

n/a

---

**Recreational use:**

**Accessiblity to public:**

Easily accessible, many visits

**Recreational fishing:**

Significant benefit --- Within the gravel pit complex there are a number of areas set aside for fishing.

**Contact watersports**

Moderate benefit --- Within the gravel pit complex there are a number of areas set aside for activities such as sailing and water-sports

**Nature of watersports (if applicable):**

Sailing/wind surf ---

**Other public benefit visits:**

Significant benefit- Award winning visitor centre, very close to Nottingham so large number of potential visitors..Nature reserve, so walkers, cyclists, bird watchers

---

**Conservation status:**

**Conservation value of lake:**

National

**Habitats Directive site:**

Not SPA or SAC --- SSSI

**SPA or SAC for aquatic interest features**

n/a ---

**SSSI or local conservation designation:**

SSSI --- Attenborough Gravel Pits SSSI is a nationally important site for its lowland eutrophic open waters with emergent vegetation, wet floodplain woodland, unimproved floodplain grassland, & Nature Reserve

---

**Description of Aquatic interest features:**

--- Notable Features of the SSSI as a Whole:

Aggregations of non-breeding birds - Bittern, Botaurus stellaris; Aggregations of non-breeding birds - Shoveler, Anas clypeata; Assemblages of breeding birds - Lowland open waters and their margins; MG4 - Alopecurus pratensis - Sanguisorba officinalis grassland; Standing waters: W6 - Alnus glutinosa - Urtica dioica woodland; Habitat Types Represented: Open Standing Water Fen, marsh and swamp Carr woodland; Wet Woodland; Lowland Meadows;Coneries Unit Features; Aggregations of non-breeding birds - shoveler; Assemblages of breeding birds - lowland open waters and their margins; Eutrophic Lakes; In addition the citation list various species within it

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**NVZ Name:** Attenborough Nature Reserve NVZ (Coneries Pond)

**NVZ ID:** EL149
Total oxidised nitrogen (TON) data

<table>
<thead>
<tr>
<th>Mean summer TON (mg/l)</th>
<th>5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of summer TON samples</td>
<td>12</td>
</tr>
<tr>
<td>75th percentile annual TON (mg/l)</td>
<td>7.3</td>
</tr>
<tr>
<td>Total number of TON samples</td>
<td>24</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 1 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 2 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Date range of TON samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

TON monitoring data

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)
NVZ ID: EL149
Total nitrogen (TN) data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean annual TN (mg/l)</td>
<td>7.4</td>
</tr>
<tr>
<td>Total number of TN samples</td>
<td>24</td>
</tr>
<tr>
<td>Confidence of annual mean TN exceeding 1 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Confidence of annual mean TN exceeding 2 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Date range of TN samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

TN monitoring data

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient nitrogen?

Strengthens
Total phosphorus (TP) data

<table>
<thead>
<tr>
<th>Annual geometric mean TP (ug/l)</th>
<th>352</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFD face value  TP class</td>
<td>Bad</td>
</tr>
<tr>
<td>Confidence of moderate or worse TP status</td>
<td>100%</td>
</tr>
<tr>
<td>Date range of TP samples</td>
<td>2010 - 2014</td>
</tr>
</tbody>
</table>

TP monitoring data

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient phosphorus?
Strengthens
Nutrient sources

Nitrogen loading estimates based on catchment map area

<table>
<thead>
<tr>
<th>Source</th>
<th>Leached N (kgN/yr)</th>
<th>Conc. (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From all agricultural sources</td>
<td>260869</td>
<td>5.6</td>
</tr>
<tr>
<td>From agricultural sources minus atmospheric deposition</td>
<td>232580</td>
<td>7045.7</td>
</tr>
<tr>
<td>From urban sources</td>
<td>237632</td>
<td>5.1</td>
</tr>
<tr>
<td>From all sources</td>
<td>498501</td>
<td>10.7</td>
</tr>
<tr>
<td>From all sources (minus atmospheric deposition)</td>
<td>470212</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Ranking based on nitrogen loading from agricultural sources 58

Local assessment 2015

Significance of loading from agricultural sources to the catchment of the lake

Minor source

Significance of loading from human habitation to the catchment of the lake

Principal source --- Point source (DB)

Significance of any other sources of nutrient loading to the catchment of the lake

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)
NVZ ID: EL149
Chlorophyll data

| Annual mean Chlorophyll (ug/l) | 23 |
| total number of Chlorophyll samples | 24 |
| WFD face value Chlorophyll class | Moderate |
| Confidence of moderate or worse status | 85% |
| Chlorophyll Good/Moderate boundary value | 20 |
| Date range of Chlorophyll samples | 2010-2014 |

Chlorophyll monitoring data

--

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)
NVZ ID: EL149
Other responses

<table>
<thead>
<tr>
<th></th>
<th>Phytoplankton (Pluto EQR)</th>
<th>Macrophytes (EQR)</th>
<th>Diatoms (EQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EQR</strong></td>
<td>No data</td>
<td>0.4</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Total number of samples/surveys</strong></td>
<td>0</td>
<td>1</td>
<td>No data</td>
</tr>
<tr>
<td><strong>WFD face value class</strong></td>
<td>Poor</td>
<td>Poor</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Confidence of moderate or worse status</strong></td>
<td>100%</td>
<td>99%</td>
<td>No data</td>
</tr>
<tr>
<td><strong>Date range of samples</strong></td>
<td>2013 - 2013</td>
<td>2012 - 2012</td>
<td>-</td>
</tr>
</tbody>
</table>

Number of years when algal blooms were observed based on reactive monitoring 2010-2015: 0

Does any other (e.g. EA non-WFD, or third party monitoring data for the lake provide improved evidence of eutrophication? (local judgement)

Strengthens evidence

To which biological element(s) does it relate?

---

**Palaeolimnology**

<table>
<thead>
<tr>
<th></th>
<th>No data</th>
<th>No data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change as Square Chord Distance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Change in Diatom community</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evidence that designated aquatic interest features associated with the lake show evidence of eutrophic disturbance? (local judgement)

Likely to be affected

**Strength of evidence** (local judgement)

Strong evidence ---

**Local judgement on the evidence of eutrophic disturbance**

Y, definitely
Comments and decisions

WFD Weight of evidence for eutrophication:

<table>
<thead>
<tr>
<th>Certainty of eutrophication problem based on core WFD tools:</th>
<th>Very certain eutrophication problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certainty of eutrophication problem based on overall weight of evidence:</td>
<td>Very certain eutrophication problem</td>
</tr>
<tr>
<td>WFD overall ecological status :</td>
<td>Poor</td>
</tr>
<tr>
<td>Confidence in WFD status :</td>
<td>Very Certain</td>
</tr>
</tbody>
</table>

Current assessment of weight of evidence supporting designation in 2017

First national panel

Recommended action : 
Needs further investigation

Comments from first panel:

All 3 lakes at Attenborough should probably be considered together unless there is any evidence of differing water sources. Question whether direct connection with the R Trent, or whether other inputs occur, and whether any significant point sources having relatively direct influence. This site was considered for designation in 2012 but not designated due to insufficient evidence. There appears to be a lack of data other than macrophytes, while other WQ and ecological data have been collected for the other two lakes in this complex. Need to check that correct sample point numbers have been used to extract data.

Second national panel

Comments from second national panel :

Reference to University of Nottingham work on these sites. 2001 UCL report on restoration targets, included palaeolimnological study showing significant change (Sayer C.D. & Roberts N. (2001) Establishing realistic restoration targets for nutrient-enriched shallow lakes: linking diatom ecology and palaeoecology at the Attenborough Ponds, U.K. Hydrobiologia 448: 117–142.). Some discussion of whether all 3 lakes have same water sources as one may be isolated, but water chemistry data indicates they are all highly enriched with N, so should be considered together. Still a need to clarify the point source contributions to the River Erewash - recent work by ADAS for Defra WQ0223 project (SEPARATE source apportionment model for P and N) confirms agricultural contribution is significant enough for designation to be supported.

Recommendation: Designate

Local summary and recommendation:

Not withstanding that this lake is already situated within a Nitrate Vulnerable Zone, we feel there is sufficient enough strong and relevant evidence to support the case for having it designated as a Polluted Water (Eutrophic) under the Nitrate Directive

NVZ Name: Attenborough Nature Reserve NVZ (Coneries Pond)  
NVZ ID: EL149
### Final summary (2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Designate</td>
</tr>
<tr>
<td>2013</td>
<td>Not Designated</td>
</tr>
<tr>
<td>2008</td>
<td>Not Designated</td>
</tr>
</tbody>
</table>

#### Lake Description:
Attenborough comprises a series of disused gravel pits excavated between 1929 and 1967. It is a high alkalinity, shallow well mixed lake. Attenborough Gravel Pits SSSI is a nationally important site for its lowland eutrophic open waters with emergent vegetation, wet floodplain woodland, unimproved floodplain grassland. Although connected to the R Erewash, the water levels in the gravel pits are largely maintained by groundwater levels and direct rainfall input. The site consists of two main bodies of water (for WFD monitoring and reporting purposes) that each have their own monitoring.

#### Why the lake should be designated as a Polluted Water (eutrophic):
The proposed Attenborough Nature Reserve NVZ lies within an existing surface water NVZ. The catchment does have inputs from a number of different sources, but agriculture is responsible for almost 50% of the nitrogen load entering the site. Reduction of input from agriculture would therefore be a significant factor.

#### Nitrogen:
Nitrogen concentrations are significantly above the 2mg/l threshold, with 75th percentile TON at 7.3 mg/l and mean annual TN at 7.4 mg/l.

#### Phosphorus:
The WFD classification for total phosphorus is Bad status.

#### Ecological response:
Phytoplankton are classed as Poor for WFD, and macrophytes also have Poor status. The aquatic interest features associated with the lake show strong evidence of eutrophic disturbance.

#### Supplementary evidence:

---

**NVZ Name:** Attenborough Nature Reserve NVZ (Coneries Pond)

**NVZ ID:** EL149
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or visit our website
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incident hotline 0800 807060 (24 hours)
floodline 0345 988 1188 / 0845 988 1188 (24 hours)

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Environment first: Are you viewing this on screen? Please consider the environment and only print if absolutely necessary. If you are reading a paper copy, please don’t forget to reuse and recycle if possible.
Evidence of eutrophication 2017

This document provides a summary of the evidence used in proposing an area of land as one which should be, or should continue to be, designated as a Nitrate Vulnerable Zone (NVZ) for the purposes of the Nitrate Pollution Prevention Regulations 2015.

A full description of the methods used in developing the NVZ proposals is set out in the detailed methodology for eutrophication-related NVZs, available via http://apps.environment-agency.gov.uk/wiyby/141443.aspx . These methods were developed under the guidance of a review group convened by the Defra for the last NVZ review (2011-2013), which included representatives from the farming and water industries as well as independent academic experts. Minor refinements to the methods have been made for the current review.

NVZs are areas of land that drain to polluted waters and which contribute to the pollution of those waters. Polluted waters include those which are eutrophic or may in the near future become so if the Regulations were not to apply there.

Eutrophication is defined as “the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned”.

For both freshwaters and saline waters, a weight-of-evidence based approach to assessing the risks and impacts of eutrophication was employed. The evidence for individual water bodies was assessed against a national suite of criteria for eutrophication in the different categories/ types of water for review. The criteria are both quantitative and qualitative and reflect scientific understanding of the process and effects of eutrophication. They are broken down in the same way for each water category as follows:-

- Nutrients
- Plants/algae
- Secondary and other effects

For each designated or candidate water body which might meet the criteria for eutrophication, a datasheet such as this one was completed, bringing together information about the water body, its catchment, its uses, evidence of eutrophication and the sources of nitrogen input.

This document is a record of the evidence used in the designation process, including results from national monitoring and assessment programmes, and further information supplied by Area staff. The proposals for NVZ designation are made as a result of close working between Area and national Environment Agency teams, with further quality assurance for the eutrophication designations through the use of a national expert panel.

An accompanying guide to these datasheets is available, which provides an explanation of the contents, acronyms and technical terms.

Some features of the maps within this report are based on digital spatial data licensed from the Centre for Ecology and Hydrology, ©. Please note that any maps shown here have not used detailed field boundaries and therefore represent the indicative 'soft' boundary only. The definitive NVZ area can be seen on the "What’s in Your Backyard" (WIYBY) website ((http://apps.environment-agency.gov.uk/wiyby/141443.aspx).
**Section 1. Lake and catchment characteristics**

| WB ID: | 34995 | 2013 NVZ status: | Not Designated |

**Lake attributes**

<table>
<thead>
<tr>
<th>EA Area</th>
<th>Derbyshire Nottinghamshire and Leicestershire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake grid co-ordinates (Easting/Northing)</td>
<td>452281 / 334304</td>
</tr>
<tr>
<td>Lake waterbody area (ha)</td>
<td>87.2</td>
</tr>
<tr>
<td>WFD Lake Typology</td>
<td>High alkalinity, very shallow, large, lowland</td>
</tr>
<tr>
<td>Lake Alkalinity (ueq/L)</td>
<td>3549</td>
</tr>
<tr>
<td>Mean lake depth (m)</td>
<td>1.7</td>
</tr>
<tr>
<td>Is the lake heavily modified according to WFD?</td>
<td>No data</td>
</tr>
<tr>
<td>Does stratification occur?</td>
<td>Well mixed</td>
</tr>
<tr>
<td>Is this waterbody a reservoir?</td>
<td>No</td>
</tr>
</tbody>
</table>

**Natural or artificial lake:**

Artificial --- Historically connected to River Erewash, however major flood defence works may change the continuity. They are not operated for any water supply or industrial use.

**Type of artificial lake:**

Gravel pit --- The reserve was established in 1966. It comprises a series of disused gravel pits excavated between 1929 and 1967.

**Lake perimeter (% artificial)**

<50% (A wide range of aquatic and waterside habitats. Between the ponds are drier areas of scrub and grassland as well as areas of native willow and old stream courses.)

**Significant changes in lake level due to seasonal drawdown:**

N

**Pumped storage or other reservoir:**

n/a

**Information on abstraction (if available)**
Lake catchment attributes

<table>
<thead>
<tr>
<th>Lake catchment area (ha)</th>
<th>19920</th>
</tr>
</thead>
<tbody>
<tr>
<td>If pumped, pumped catchment area (ha)</td>
<td></td>
</tr>
</tbody>
</table>

**Hydrological character**

Ground and surface water --- From superficial sands and gravels. No data for groundwater nitrate component, but possibly from surrounding urban source.

---

**NVZ 2017 lakes review**

The above map has not used the detailed field boundaries and is the indicative ‘soft’ boundary. The definitive NVZ area can be seen on the Environment Agency website (www.environment-agency.gov.uk).

**Comments on accuracy of lake catchment:**

Is the map representative of the natural catchment?

n/a

Is the map representative of the artificial catchment?

Yes
Section II - Waterbody uses

Water Supply:
Controlled water (Section 104 of Water Resources Act):
Yes

Public Water Supply:
No

Drinking Water Protected Area:
No

UWWTD designation
Yes --- The river Erewash is a SA(e) river which flows through the pits. (DB)

Used for hydropower or flow regulation:
 n/a

Recreational use:
Accessibility to public:
Easily accessible, many visits

Recreational fishing:
n/k --- Within the gravel pit complex there are a number of areas set aside for fishing.

Contact watersports
Moderate benefit --- Within the gravel pit complex there are a number of areas set aside for activities such as sailing and water-sports.

Nature of watersports (if applicable):
Sailing/wind surf ---

Other public benefit visits:
Significant benefit - Award winning visitor centre, very close to Nottingham so large number of potential visitors.
Nature reserve, so walkers, cyclists, bird watchers

Conservation status:
Conservation value of lake:
National

Habitats Directive site:
Not SPA or SAC --- SSSI

SPA or SAC for aquatic interest features
n/a ---

SSSI or local conservation designation:
SSSI --- Attenborough Gravel Pits SSSI is a nationally important site for its lowland eutrophic open waters with emergent vegetation, wet floodplain woodland, unimproved floodplain grassland, & nature reserve

Description of Aquatic interest features:
--- Notable Features of the SSSI as a Whole:
Aggregations of non-breeding birds - Bittern, Botaurus stellaris; Aggregations of non-breeding birds - Shoveler, Anas clypeata; Assemblages of breeding birds - Lowland open waters and their margins; MG4 - Alopecurus pratensis - Sanguisorba officinalis grassland; Standing waters: W6 - Alnus glutinosa - Urtica dioica woodland; Habitat Types Represented: Open Standing Water Fen, marsh and swamp Carr woodland; Wet Woodland; Lowland Meadows; Coneries Unit Features; Aggregations of non-breeding birds - shoveler; Assemblages of breeding birds - lowland open waters and their margins; Eutrophic Lakes; In addition the citation list various species within it
### Total oxidised nitrogen (TON) data

| Table Title | Value  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean summer TON (mg/l)</td>
<td>5.1</td>
</tr>
<tr>
<td>Total number of summer TON samples</td>
<td>3</td>
</tr>
<tr>
<td>75th percentile annual TON (mg/l)</td>
<td>7.5</td>
</tr>
<tr>
<td>Total number of TON samples</td>
<td>6</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 1 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Confidence of annual 75th %ile TON exceeding 2 mg/l</td>
<td>High</td>
</tr>
<tr>
<td>Date range of TON samples</td>
<td>2010 - 2010</td>
</tr>
</tbody>
</table>

### TON monitoring data

![TON monitoring data graph](image-url)

**NVZ Name:** Attenborough Nature Reserve NVZ (Main Pond)  
**NVZ ID:** EL149
Mean annual TN (mg/l) | 7.1
Total number of TN samples | 6
Confidence of annual mean TN exceeding 1 mg/l | High
Confidence of annual mean TN exceeding 2 mg/l | High
Date range of TN samples | 2010 - 2010

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient nitrogen?

Strengthens
### Total phosphorus (TP) data

<table>
<thead>
<tr>
<th>Annual geometric mean TP (ug/l)</th>
<th>252</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFD face value TP class</td>
<td>Bad</td>
</tr>
<tr>
<td>Confidence of moderate or worse TP status</td>
<td>100%</td>
</tr>
<tr>
<td>Date range of TP samples</td>
<td>2010 - 2010</td>
</tr>
</tbody>
</table>

#### TP monitoring data

![TP monitoring data graph](image)

Does any other (e.g. EA non-WFD, or third party) monitoring data for the lake provide improved evidence of significantly elevated nutrient phosphorus?

Strengthens
Nitrogen loading estimates based on catchment map area

<table>
<thead>
<tr>
<th>Source</th>
<th>Leached N (kgN/yr)</th>
<th>Conc. (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From all agricultural sources</td>
<td>260869</td>
<td>5.6</td>
</tr>
<tr>
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<td>From all sources</td>
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<td>10.7</td>
</tr>
<tr>
<td>From all sources (minus atmospheric deposition)</td>
<td>470212</td>
<td>10.1</td>
</tr>
</tbody>
</table>

**Ranking based on nitrogen loading from agricultural sources**: 57

Local assessment 2015

Significance of loading from agricultural sources to the catchment of the lake

Minor source

Significance of loading from human habitation to the catchment of the lake

Principal source --- Point source (DB)

Significance of any other sources of nutrient loading to the lake or its catchment
Section IV - Response - Plants/Algae

Chlorophyll data

<table>
<thead>
<tr>
<th>Annual mean Chlorophyll (ug/l)</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>total number of Chlorophyll samples</td>
<td>6</td>
</tr>
<tr>
<td>WFD face value Chlorophyll class</td>
<td>Moderate</td>
</tr>
<tr>
<td>Confidence of moderate or worse status</td>
<td>72%</td>
</tr>
<tr>
<td>Chlorophyll Good/Moderate boundary value</td>
<td>20</td>
</tr>
<tr>
<td>Date range of Chlorophyll samples</td>
<td>2010-2010</td>
</tr>
</tbody>
</table>

Chlorophyll monitoring data

NVZ Name: Attenborough Nature Reserve NVZ (Main Pond)
NVZ ID: EL149
Other responses

<table>
<thead>
<tr>
<th>Phytoplankton (Pluto EQR)</th>
<th>Macrophytes (EQR)</th>
<th>Diatoms (EQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQR</td>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>Total number of samples/surveys</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>WFD face value class</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Confidence of moderate or worse status</td>
<td>100%</td>
<td>99%</td>
</tr>
<tr>
<td>Date range of samples</td>
<td>2013 - 2013</td>
<td>2012 - 2012</td>
</tr>
</tbody>
</table>

Number of years when algal blooms were observed based on reactive monitoring 2010-2015: 0

Does any other (e.g. EA non-WFD, or third party monitoring data for the lake) provide improved evidence of eutrophication? (local judgement)
Strengthens evidence

To which biological element(s) does it relate?
---

**Palaeolimnology**

| Change as Square Chord Distance | No data |
| Change in Diatom community | No data |

Evidence that designated aquatic interest features associated with the lake show evidence of eutrophic disturbance? (local judgement)
Likely to be affected
Strength of evidence (local judgement)
Strong evidence ---
Local judgement on the evidence of eutrophic disturbance
Y, definitely

---

NVZ Name: Attenborough Nature Reserve NVZ (Main Pond)
NVZ ID: EL149
Comments and decisions

WFD Weight of evidence for eutrophication:

Certainty of eutrophication problem based on core WFD tools: Very certain eutrophication problem

Certainty of eutrophication problem based on overall weight of evidence: Very certain eutrophication problem

WFD overall ecological status: Poor

Confidence in WFD status: Very Certain

Current assessment of weight of evidence supporting designation in 2017

First national panel

Recommended action: Needs further investigation

Comments from first panel:

All 3 lakes at Attenborough should probably be considered together unless there is any evidence of differing water sources. Question whether direct connection with the R Trent, or whether other inputs occur, and whether any significant point sources having relatively direct influence. This site was considered for designation in 2012 but not designated due to insufficient evidence. There appears to be a lack of data other than macrophytes, while other WQ and ecological data have been collected for the other two lakes in this complex. Need to check that correct sample point numbers have been used to extract data. All 3 lakes at Attenborough should probably be considered together unless there is any evidence of differing water sources. Question whether direct connection with the R Trent, or whether other inputs occur, and whether any significant point sources having relatively direct influence.

Second national panel

Comments from second national panel:

Reference to University of Nottingham work on these sites. 2001 UCL report on restoration targets, included palaeolimnological study showing significant change (Sayer C.D. & Roberts N. (2001) Establishing realistic restoration targets for nutrient-enriched shallow lakes: linking diatom ecology and palaeoecology at the Attenborough Ponds, U.K. Hydrobiologia 448: 117–142.). Some discussion of whether all 3 lakes have same water sources as one may be isolated, but water chemistry data indicates they are all highly enriched with N, so should be considered together. Still a need to clarify the point source contributions to the River Erewash - recent work by ADAS for Defra WQ0223 project (SEPARATE source apportionment model for P and N) confirms agricultural contribution is significant enough for designation to be supported.

Recommendation: Designate

Local summary and recommendation:

Not withstanding that this lake is already situated within a Nitrate Vulnerable Zone, we feel there is sufficient enough strong and relevant evidence to support the case for having it designated as a Polluted Water (Eutrophic) under the Nitrate Directive

NVZ Name: Attenborough Nature Reserve NVZ (Main Pond)
NVZ ID: EL149
Final summary (2017)

2017 Recommendation: Designate
2013 Decision: Not Designated
2008 Decision: Not Designated

Lake Description:
Attenborough comprises a series of disused gravel pits excavated between 1929 and 1967. It is a high alkalinity, shallow well mixed lake. Attenborough Gravel Pits SSSI is a nationally important site for its lowland eutrophic open waters with emergent vegetation, wet floodplain woodland, unimproved floodplain grassland. Although connected to the R Erewash, the water levels in the gravel pits are largely maintained by groundwater levels and direct rainfall input. The site consists of two main bodies of water (for WFD monitoring and reporting purposes) that each have their own monitoring.

Why the lake should be designated as a Polluted Water (eutrophic):
The proposed Attenborough Nature Reserve NVZ lies within an existing surface water NVZ. The catchment does have inputs from a number of different sources, but agriculture is responsible for almost 50% of the nitrogen load entering the site. Reduction of input from agriculture would therefore be a significant factor.

Nitrogen:
After 2010 monitoring was only carried out in the Beeston Pond, and Coneries Pond - as all 3 are connected and share a catchment those values have been used. Mean nitrogen concentrations are significantly above the 2mg/l threshold.

Phosphorus:
The WFD classification for total phosphorus is Bad status.

Ecological response:
After 2010 monitoring was only carried out in the Beeston Pond and Coneries Pond, with the exception of macrophytes - as all 3 are connected and share a catchment the response of the monitored elements in each lake is taken as representing all 3 pits. Chlorophyll and overall phytoplankton are classed as Moderate or Poor for WFD. Macrophytes in the Main Pond are at Poor status. That aquatic interest features associated with the lake show strong evidence of eutrophic disturbance.

Supplementary evidence:
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