Anglian Water

7B. EA NITRATE SCHEMES LETTER

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Toni Holtby
Water Quality Policy and Strategy Manager
Anglian Water Services
Lancaster House
Lancaster Way
Ermine Business Park
Huntingdon
PE29 6YJ

Our Ref: JG/AWS/DrWPA

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By email only

Dear Toni

PR19 NITRATE TREATMENT PROPOSALS

Thank you for the information you presented at the PR19 Nitrate meeting on the 30 November 2017 with regard to additional or uprated nitrate treatment requirements and the request for a letter of support from the Environment Agency with respect to these schemes. In the DWI's Guidance Note 'Long term planning for the quality of drinking water supplies' September 2017 section 4.11.2 states:

> *"Any increasing trend of nitrate concentrations in groundwater should be accompanied by catchment control under the EC Nitrates Directive, in the first instance, and treatment solutions should to be considered as a last resort, supported by written confirmation from the environmental regulator that potential catchment management solutions are exhausted."*

Catchment control is also needed to meet Drinking Water Protected Area objectives set out in the Water Framework Directive. As it currently stands we do not believe catchment management actions have been exhausted in the catchments you have identified. Therefore we would only support the treatment proposals if there is parallel tracking of catchment management within all of these catchments. The overall aim of that catchment management is to prevent deterioration in nitrates in raw waters and reduce this additional treatment requirement in the long term. Our expectation is that this additional treatment will be removed from these works at the earliest opportunity.

We look forward to seeing your detailed proposals of catchment management and the specific targets to demonstrate that the objectives will be met, including the plan as to the earliest opportunity the treatment reduction will be achieved.

This catchment management can be included in the PR19 WINEP prior to becoming business as usual in subsequent AMP cycles.

To help support Anglian Water, we will work with you to identify Safeguard Zones. These are used to highlight the continued deterioration of water quality at these sources and to target measures that aim to avoid deterioration in water quality. This is so that treatment can be reduced in the long term. It is important that Anglian Water commit to, and own, catchment management initiatives which specifically target the practices impacting upon the raw nitrate quality within their catchments, with the aim of reducing the level of purification treatment required for the production of drinking water. Payment for ecosystem services may be needed to achieve those aims.

Appended to this letter are some general comments from Area Environment Agency technical specialists on the hydrogeological settings of the individual source treatment proposals. This includes information on our current understanding of the lag times before future implemented catchment measures will reduce nitrate concentrations. If you have additional information on these sources please inform us.

We would highlight that catchment control is a requirement of the EC Nitrates Directive. The catchment management will also be captured by conditions included within the DWI Undertaking for this additional treatment and we will work with them to achieve a consistent approach where appropriate.

Yours sincerely

John Giles
River Basin Account Manager (Anglian)

john.giles@environment-agency.gov.uk
www.gov.uk/environment-agency

APPENDIX: AWS sources where additional or uprated nitrate treatment is needed:

Lincolnshire & Northamptonshire

Additional Ion Exchange Plants at Irby WTW (Designed in AMP 6)

The Lincs & Northants GWCL team support the principle of the installation of an Ion Exchange plant to maintain deployable output at Irby Water Treatment Works. Irby blends groundwater from the chalk aquifer from Healing, Habrough, Little London, Littlecoates, Weelsby, Tetney and also surface water from Covenham Reservoir. Our investigations have shown there to be a considerable store of nitrate from arable farming in the unsaturated zone of the chalk aquifer. The unsaturated zone is up to 60 m thick and the bulk of nitrate has been shown to be moving vertically at the rate of around 1m/year toward the saturated zone. Concentrations of nitrate in groundwater at Healing, Habrough and Little London are above 50 mg/l.

The blended water at Irby Reservoir is at risk of exceeding the prescribed concentration value for nitrate within 5 years, and the nitrate concentration in all groundwater sources continues to rise. Other pressures exist within the catchment which result in a need to retain some of the sources with high nitrates, including Littlecoates – high profile groundwater flooding issues in Grimsby can be controlled by depressing the water table using the Grimsby abstraction. Our modelled forecast for Littlecoates public water supply showed a long lag time (>20 years) for catchment measures to effect a change in the upward nitrate trend and thus start to improve groundwater quality.

In the short and medium term ion exchange is considered to be the primary mechanism with which Anglian Water Services can provide potable water with a nitrate concentration <50 mg/l, and we support this. Catchment management remains the long-term solution for the Lincolnshire Chalk catchment, and measures are included in PR19 to progress and build on work already completed and underway.

East Anglia (East)

Uprating of Ion Exchange plant at Lyng Forge WTW

The nitrate concentrations are well in excess of drinking water standards and continue to rise as a consequence of long transit times and the legacy of nitrate stored in the unsaturated zone.

Transit times of > 50 years are likely on the interfluves, with around 12% of the catchment having transit times < 5 years. This suggests catchment measures may have some impact at relatively short timescales, but are unlikely to provide conditions for an untreated supply in anything but the longer term.

Uprating of Ion Exchange plant at Wighton WTW

A similar situation to Lyng Forge; nitrate concentrations exceed of drinking water standards and continue to rise as a consequence of long transit times and the legacy of nitrate stored in the unsaturated zone.

Transit times of > 50 years are likely on the interfluves, with around 14% of the catchment having transit times < 5 years. This again suggests catchment measures may have some impact at relatively short timescales, but are unlikely to provide conditions for an untreated supply in anything but the longer term.

East Anglia (West)

Uprated Ion Exchange at Marham WTW

The water from this sources is currently blended with lower nitrate surface water. However due to sustainability of river flows this low nitrate blend option may cease. The aquifer has a high transmissivity in this location and the unsaturated zone is relatively thin. Therefore this source could be a good candidate for catchment management. Water Company modelling suggests about 40% of the catchment is within a 25 year lag time of the source.

25% of the total catchment within the 25 year lag time is arable, which is considered to be the greatest land use contributing to nitrate within the catchment. It is worth noting that nitrate concentrations are high (approximately twice the Drinking Water Standard) and the catchment is large, therefore extensive land use change would have economic impacts to those businesses. However this is a catchment where a level of catchment management could have beneficial impacts even if some level of treatment is required into the future. We therefore support the increased treatment subject to catchment management being implemented in parallel.

New Ion Exchange at Risby/Little Saxham WTW

Following a replacement borehole at Risby, nitrate concentrations are higher than previously envisaged and predicted following modelling. Therefore nitrate treatment is required in the short/medium term to ensure the blend quality with Barrow Heath at the Little Saxham reservoir is maintained.

The nitrate concentration is hovering around 60 +/- 5mg/l as NO_3. Previous modelling suggests this source would be receptive to catchment management and could potentially see effects of catchment management within 5-20 years. Around 15% of the total catchment is within a 0-5 year unsaturated zone lag time, with 12% of this being Arable and considered to be the predominant cause of the nitrate loading.

In the short term we would support the increased treatment subject to catchment management being implemented in parallel.

New Ion Exchange Plant at Congham WTW / Hillington WTW

Congham is a currently unused source which is required again, with current blending options not sufficient. The source has not been modelled previously therefore land use and lag times are not available. This would be useful information in the future to help inform potential areas to focus catchment measures. The current nitrate trend is upwards with recent concentrations of nitrate around 55mg/l as NO_3.

Based on current information, we cannot say catchment management has been exhausted but due to the lag times associated with the catchment and the abstraction requirements in the short term, we would support this scheme subject to catchment management being implemented in parallel.

New Ion Exchange Plant at Gayton WTW / Hillington WTW

The Gayton source has been identified as requiring new nitrate treatment. The nitrate trend has been generally rising with concentrations currently around 60mg/l as NO_3. Modelling demonstrates over 35% of the total catchment has a lag time of around 0-25 years, with 30% of the total catchment consisting of arable land use within this 0-25 years lag time.

The modelling suggests this catchment would be receptive to catchment management therefore we would support this scheme in the short to medium term subject to catchment management being implemented in parallel.