

UK Technical Advisory Group on the Water Framework Directive

Peer review of updated classification guidance and stakeholder consultation - March 2012

1. Introduction

This document presents the outcomes of a peer review of revised groundwater status classification (chemical and quantitative) guidance documents and the proposals for formalising the application of groundwater standards to regulation under the Water Framework Directive (WFD) and Groundwater Directive (GWD). The peer review was commissioned by the UKTAG Groundwater Task Team (GWTT) and carried out by Rob Sage (Veolia Water) and John Chilton (International Association of Hydrogeologists).

The peer review was carried out principally during a workshop held on Friday 20th January 2012 at which the relevant documents were introduced by the main authors (GWTT) and the changes and new aspects explained to the peer reviewers. A discussion on each of the key changes/new elements followed and the peer reviewers were invited to provide feedback and comment. For the classification guidance a peer review was carried out prior to the publication of the versions used for the 1st cycle of river basin management planning. The peer review of these documents therefore only related to significant changes that are being proposed ahead of the 2nd cycle of river basin management planning.

Following completion of this report the peer reviewers have been invited to provide further feedback on its content and confirm that it represents a true record of the peer review process and accurately reflects their comments and recommendations.

2. Background

As a result of carrying out WFD status assessment for groundwater and reviewing the outcomes, and in light of new information and research outputs that have become available, GWTT carried out a review of the classification methods. This led to proposals for a number of improvements and refinements to the classification, thresholds and associated tests. The review also took into account stakeholder feedback. The intention is to apply the updated methodologies for the 2nd cycle of river basin management planning.

Another development has been the preparation of a proposal for formalisation of regulatory standards for assessing compliance with the objective to prevent or limit the entry of pollutants to

groundwater. These standards have not previously been formally consulted on in the context of the WFD/GWD although they are widely used across the UK in environmental permitting and licensing.

The proposed changes to the classification thresholds and the proposals for regulatory standards have resulted in the update of the original (chemical and quantitative) classification guidance documents and a new document entitled “Groundwater Task Team Draft Submission for UKTAG Phase 3 Standards Report”. The latter document summarises the changes made to the classification thresholds as part of GWTTs submission to UKTAG. This will then be edited and included as part of a wider stakeholder consultation on changes to standards for all water media.

3. Chemical status guidance

An overview of the minor amendments/updates to this document was presented to the peer reviewers. The minor changes related to updating references to the river basin management planning (RBMP) process e.g. to reflect the application of the revised guidance to the 2nd cycle of RBMP, clarification of the difference between groundwater classification and surface water classification where appropriate, e.g. for drinking water protected areas, and minor improvements to the descriptions of the status tests. These changes were approved by the peer reviewers as they introduced no substantive changes to the guidance document. The peer reviewers also recognised and supported the improvements made to improve the clarity of the guidance.

The more significant changes were introduced and discussed separately. They include: 1) the deletion of Annex II and the proposed changes to the nitrate threshold value; 2) amendments to the General Chemical Test (Section 8) and the Drinking Water Protected Area Test (Section 7); 3) amendment to the test for ‘no significant diminution of surface water chemistry and ecology’ (Section 5); 4) the introduction of a new Groundwater Dependent Terrestrial Ecosystem (GWDTE) Test (Section 6); and 5) the introduction of confidence tables.

3.1 Nitrate threshold values

The original version of the guidance contained an Annex (Annex II) which provided instructions on the derivation of threshold values for the General Chemical and the Drinking Water Protected Area tests. The methodology provided two options: 1) calculation of an ‘appropriate percentage’ of the relevant use based standard or 2) the use of a default value (75% of the standard) where there are insufficient data to apply Option 1.

The outcome of classification for the 1st RBMP cycle resulted in Option 1 being applied in England, Wales and Scotland and Option 2 in Northern Ireland (and Republic of Ireland) for nitrate, and Option 2 in all countries for all other pollutants. These variations reflected the availability of data in each country and for the different pollutants.

Feedback from UKTAG expressing concerns about the variation in value used across the UK resulted in a review of the use of the ‘appropriate percentage’ and the development/testing of a UK-wide hydrogeological typology based approach. This work showed that no significant differences could be found between the different typologies (6) selected and GWTT subsequently recommended that for the 2nd cycle of RBMP a single nitrate threshold value of 37.5 mg/l (as NO₃) be adopted across the

UK for the General Chemical Test and the Drinking Water Protected Area Test. Hence Annex II was deleted and the relevant status tests and Annex I amended.

The peer reviewers agreed with the approach used to investigate threshold values and supported the conclusion that there was no significant difference between typologies and that no further work was justified. They agreed on the proposed approach for harmonisation of nitrate threshold values across the UK.

3.2 Changes to the Drinking Water Protected Area Test

Only minor changes have been made to this test. There has been no change to the methodology. The changes reflect the change to the nitrate threshold value described in 3.1 and also a clarification of the difference between surface water drinking water protected areas and groundwater drinking water protected areas (DWPA). In the latter case groundwater bodies that are, or contain DWPA are subject to status assessment and DWPA objectives must be met for a groundwater body to be at good status.

The peer reviewers approved the modifications to this test.

3.3 Changes to the General Chemical Test

Only minor changes have been made to this test. The methodology has been modified slightly to clarify the purpose of the test, remove ambiguity and to incorporate the requirements of Article 5(5) of the Groundwater Directive in relation to expanding pollutant plumes from contaminated land. In the absence of other standards drinking water standards have been used as a basis for setting threshold values as this test relates to impairment of (current or future) human uses.

The additional elements introduced for this test are: 1) the comparison of individual operational monitoring point data (average concentrations over 6 years) with drinking water standards. The groundwater body will be at good status if no exceedances are found, otherwise further investigation must be carried out; 2) to determine if the impacts are widespread.

In the previous version of the guidance little information was provided on what constituted widespread impact. Following subsequent publication of CIS guidance, discussions with the European Commission and experience from the 1st RBMP cycle, two options are proposed – one for cumulative/diffuse pollution impacts and one for widespread point source pollution impacts.

For cumulative effects of a large number of small pollutant releases or diffuse inputs, the approach has not changed. A groundwater body average is assessed against the relevant threshold value(s). For groundwater bodies that contain one or more widespread point source impacts such as a contaminant plumes, a significant impact is considered to be where the area impacted (concentrations greater than the threshold value) is more than 20% of the minimum size of a groundwater body. This equates to 2km².

The peer reviewers approved the modifications to this test. They asked that the authors review the text of the GWTT Phase 3 Standards Report to ensure that there was consistency between the two documents. A further query was raised about the widespread impacts that had caused a groundwater body to be at poor status but where measures had been put in place to restore the

body to good status, e.g. banning of atrazine. Should the body still be at poor status? GWTT explained that the body would remain at poor status whilst the test was failed. Status is a snapshot of the current condition of the groundwater body. Over time the reduction in concentrations would lead to the body returning to good status. Trend assessment was also very important to ascertain the changing condition within the groundwater body, e.g. increasing trend in pollutant concentrations indicating expanding plume.

3.4 Surface water test – no significant diminution of surface water chemistry and ecology

Following experience from the 1st cycle of RBMP and status assessment it was found that for this test there was a chance of misclassification because the threshold value was potentially too high. Cases have been identified where a surface water EQS failure could be attributed to groundwater but where there had not been a failure of a groundwater threshold value. To address this, the threshold value (TV) of this test has been modified so that it is now as follows:

TV = 0.5 x (EQS/Dilution Factor); or upper limit of natural background

Where the dilution factor is in the range 0.1 – 0.9 and reflects the contribution that groundwater makes to total flow in the surface water body.

The peer reviewers approved the amendment to this test.

3.5 Groundwater Dependent Terrestrial Ecosystem (GWDTE) test

In the previous version of the chemical classification guidance no specific guidance was provided for assessing chemical status in relation to GWDTEs. The only information provided was a reference to the quantitative status guidance.

Since then the UKTAG Wetlands Task Team have developed threshold values for GWDTEs and as a result individual tests have been developed for chemical and quantitative status. The revised guidance document now contains a new test.

As with the other tests the results of groundwater monitoring are compared to relevant threshold values where a GWDTE is considered to be adversely impacted by polluted groundwater. The threshold values have, to date, only been derived for nitrate but others may follow in the future. Different threshold values apply to different wetland types and environmental setting. A failure of a threshold value on its own does not lead to poor status but triggers further investigation.

The peer reviewers suggested that the table/matrix of threshold values should be included in the classification guidance document and that the terminology used in the guidance should be reviewed. For example “assess risk” should be “assess significance of ecological impact” (Section 6.4).

The peer reviewers approved of the introduction of GWDTE chemical status test. They commented on the potential economic and resource implications in relation to this test but recognised that there was an important need for it. They also recommended that the results of the WTT peer review process should be taken into account when completed.

3.6 Confidence tables

A new element to the classification guidance document (both chemical and quantitative) was the introduction of tables which outlined the criteria for ascribing confidence (High or low) to the status result (good or poor). Confidence in classification is ascribed not on the basis of statistical confidence in the result (as with surface water) but on weight of evidence.

The peer reviewers recommended that tables should be included for each test and in both status assessment guidance documents.

4. Quantitative Status guidance

An overview of the minor amendments/updates to this document was presented. The minor changes related to updating references to the river basin management planning (RBMP) process e.g. to reflect the application of the revised guidance to the 2nd cycle of RBMP and minor improvements to the descriptions of the status tests. These changes were approved by the peer reviewers as they introduced no substantive changes to the guidance document. The peer reviewers also recognised and supported the improvements made to improve the clarity of the guidance.

The more significant changes were introduced and discussed separately. They include: 1) the revision of the water balance test (Section 4), 2) the revision of the Groundwater Dependent Terrestrial Ecosystem (GWDTE) Test (Section 6); and 3) the introduction of confidence tables for each test.

4.1 Water balance test

The water balance test had been revised in response to experience in the 1st cycle of RBMP. In a number of cases groundwater bodies failed this status test but with no evidence of impact such as environmentally significant reduction in river flows, damage to wetlands or declining water levels. The changes proposed do not alter the methodology but introduce the requirement for additional lines of evidence which indicate that there is an impact as a result of the depletion of groundwater resources instead of relying solely on the result of a simple water balance calculation.

The peer reviewers approved the introduction of the additional criteria for this test and the practical approach being proposed especially with respect to the additional lines of evidence identified. A further recommendation was to modify the text to reflect the style and structure of the other tests.

4.2 Groundwater Dependent Terrestrial Ecosystem (GWDTE) test

This test has been revised significantly after taking into account the recommendations of the UKTAG Wetland Task Team. The approach is similar to that described in 3.5 but instead of using threshold values, an assessment is made of the potential impacts of groundwater abstractions that may cause alteration in flow and levels that may lead to significant damage on the GWDTE.

The peer reviewers approved of the revised of GWDTE quantitative status test. They also indicate that relevant comments on the GWDTE chemical status test, e.g. terminology should be taken in to account and also the results of the WTT peer review process when completed.

4.3. Confidence tables

The peer review comments in 3.6 also apply here.

5. UKTAG Phase 3 Standards Report

This report has been prepared as a contribution from GWTT to UKTAG for the forthcoming stakeholder consultation. It does not represent a formal guidance document but includes a summary of the significant changes to the status assessment guidance documents described in 3 and 4, and presents proposals for the formalising the 'Prevent or Limit' (regulatory) standards in relation to the Groundwater Directive. The peer reviewers were asked to comment on the approach proposed.

The purpose of the formalisation of the regulatory standards is to achieve greater clarity and consistency in what and how standards apply. The proposals are based on the current practices of the Environment Agencies when regulating activities that may potentially pollute groundwater.

The peer reviewers agreed that formalising the process was sensible and approved of the process of stakeholder consultation being proposed as it was consistent with 'Better Regulation'. They recommended that the tables should remain in the document but requested that the authors review the list (tables) of substances as the non hazardous table appeared to contain hazardous substances. Additionally a number of the footnotes appeared incorrect.

In terms of options for application of the standards, the preference of the peer reviewers was for the values for the hazardous substances to be applied as MACs and those of the non-hazardous as 95th percentiles. However it was cautioned that there should be further consideration of the implications of this as the peer reviewers both indicated that they were not expert in this area.

The peer reviewers further recommended that the authors make it clear what was being consulted on and what was outside the scope of the consultation, particularly that we are not redefining DW standards or the determinations made by JAGDAG on hazardous substances. Additionally they recommended that there needed to be clarification in 5.4.3 of the standards report to ensure that compliance applied to locations 'down gradient' of the source and also to clarification of the situation where groundwater up gradient of the sites already contains elevated concentrations of pollutants. The peer reviewers also recommended taking account of trends when considering non hazardous substances. They also suggested some minor editorial changes.

6. Conclusions

Overall the peer reviewers were satisfied with the proposed changes to both guidance documents and the proposal to consult on the application of regulatory standards. Subject to incorporation of the revisions and amendments agreed at the peer review workshops the peer reviewers both recommended that the documents should be presented for stakeholder consultation.

The peer reviewers also agreed that, to the best of their knowledge, the guidance/consultation documents:

- Incorporate the best current state of scientific knowledge available in terms of management and understanding of groundwater and surface water/GWDTE relationships for the variety of hydrogeological systems encountered across the UK (including Northern Ireland).
 - Represent a sound basis for determining the chemical and quantitative status of groundwater bodies and represent an improvement on the methodologies used for the first river basin planning cycle.
 - Propose an approach for the application of regulatory standards to groundwater that is transparent and consistent with the objectives of preventing or limiting the entry of hazardous and non-hazardous pollutants to groundwater.
 - Are compatible with the requirements of the Water Framework Directive and Groundwater Directive (and with relevant CIS guidance)
-

This report was prepared by Dr Rob Ward (British Geological Survey), member of the UKTAG Groundwater Task Team and chair of the Peer Review Workshop.

Date: 10th February 2012

The document has been reviewed by the peer reviewers (John Chilton and Rob Sage) and other members of the Groundwater Task Team who were present at the peer review workshop (Matthew Craig, Anna Hall, Vincent Fitzsimons) to confirm that it represents a true record of the workshop. Email confirmation from the peer reviewers is appended below:

From: Sage, Rob [mailto:rob.sage@veoliawater.co.uk]
Sent: 15 March 2012 20:19
To: Ward, Robert S.; Chilton, John
Subject: RE: GWTT Peer Review

Dear Rob,

Thank you for compiling this record of the Peer Review meeting, and I confirm that it represents a true record of the workshop, the information sent to us and the discussions we had at the meeting. The text accurately reflects our comments, suggestions and recommendations.

I now consider that the documents will be of sufficient quality to be sent for stakeholder consultation.

Regards

Rob Sage

Asset Specialist - Water Resources
Physical Asset Management

Veolia Water Central
Tamblin Way
Hatfield, Herts

AL10 9EZ
Tel: 01707 679365

Mob: 07801 677752
<mailto:rob.sage@veoliawater.co.uk>

From: Chilton, John
Sent: 29 February 2012 13:11
To: Ward, Robert S.
Subject: RE: GWTT Peer Review

Dear Rob,

Thanks for your message. I have been away. I can confirm this is a true record of our discussions.

Best regards,

John

From: Ward, Robert S.
Sent: 24 February 2012 09:25
To: rob.sage@veoliawater.co.uk; Chilton, John
Subject: GWTT Peer Review

Dear Rob and John,

Once again thank you for attending the peer review workshop and I hope that you have been able to sort out payment and re-imbusement. Please let me know if there are any problems with this.

As promised we have produced a record of the meeting which identifies your comments and recommendations etc. This is attached. To formalise the sign off I presented this at the last GWTT meeting. I now need to ask you if you could review the document to confirm that it represents a true record of events, or if not where we need to make changes. Once you are happy with the content, I would appreciate a brief email from you confirming this. I will then append this to the end of the document.

Kind regards

Rob

Dr Rob Ward

Head of Groundwater Science

BGS

Email: rswa@bgs.ac.uk

DRAFT