West Cumbria Groundwater Resources

31st March 2015

Assessment of groundwater resources in the West Cumbria aquifer

The Environment Agency has a duty to manage, monitor and protect groundwater resources, making sure there is enough water for people, business and the environment. One of the methods of doing this is by using the Catchment Abstraction Management Strategy (CAMS) process to assess the groundwater resources in an aquifer, which helps us assess any new abstractions. In the West Cumbria Permo-Triassic Sandstone aquifer this assessment was first completed in 2008.

Since that time, United Utilities' (UU) abstraction licence at Ennerdale has been altered due to changes in the Habitats Directive relating to the River Ehen. This initially led to new groundwater abstractions near Egremont being developed. The Ennerdale licence is now due to be revoked by 2022 and in their draft Water Resource Management Plan UU were looking at alternative supplies of water in West Cumbria, including potential new groundwater abstractions. Additionally, there are proposals for a new nuclear power station, adjacent to Sellafield, where a water supply will be needed.

Although the Groundwater Body is at good status under the Water Framework Directive, these extra potential pressures on the groundwater in the aquifer have led to us realising that our present assessment is no longer fit for purpose to assess any new abstraction licence applications.

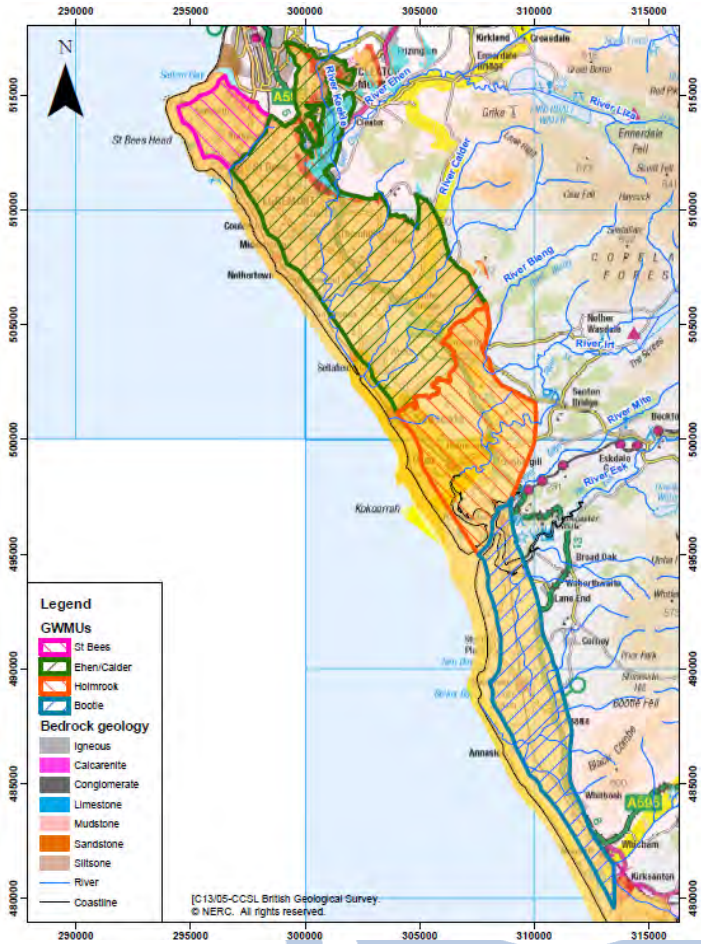
Therefore in September 2014 a study was started to update the assessment of the resources in the aquifer. The study concluded in March 2015 and this note provides a summary of the outputs.

CAMS Groundwater Management Units (GWMUs)

In the 2008, and updated 2013, abstraction licensing strategy for the Derwent and West Cumbria, the West Cumbria sandstone aquifer was reported as one unit, with an available resource of 45.4 Ml/d. However it is known that not all this water will be available in all parts of the aquifer and a more refined assessment was required.

The first part of the assessment has led to the aquifer being split into 4 GWMUs. This was done based on the geology, hydrogeology and hydrometric data of the area. The boundaries of the units are mainly based on the hydrology and are either catchment divides or actual watercourses.

The 4 GWMUs, St Bees, Ehen/Calder, Holmrook, and Bootle are shown on the map.



Groundwater resource availability

The available resource for each GWMU is assessed by comparing the amount of groundwater licensed to be abstracted, or the recent actual abstraction amounts, with the amount of water, known as recharge, that gets into the sandstone aquifer. The recharge is calculated for each of the zones using a number of data sources including the average rainfall and evaporation, the type of land use and soil, and the type and thickness of superficial geology that overlies the sandstone. The recharge and abstraction in each zone is shown in the following table.

	Recharge (Ml/d)	Licensed Abstraction (Ml/d)	Recent Actual Abstraction (Ml/d)
St Bees	11.4	0.05	0
Ehen/Calder	78.6	24.2	11.80
Holmrook	5.6	0	0
Bootle	21.5	0.01	0
Total (GW body)	117.2	24.26	11.8

As seen from the table the total recharge to the groundwater body is 117.2 Ml/d, with a resource availability of 92.9 Ml/d. This compares with a previous amount of 45.4 Ml/d. This difference is due to the better method of calculating the recharge using local data, whereas previously an estimate was used based on regional estimates.

Final CAMS assessment

The assessment shows that there is groundwater available in all the units, however potential impacts on rivers also need to taken into account. The rivers Ehen, Calder and Irt all have restrictions to new abstraction and therefore within the Ehen/Calder and Holmrook GWMUs we wouldn't be able to grant new licences if they were likely to impact on flows. The table below shows the final resource availability status for the GWMUs that will be published in the licensing strategy.

	Available resource	Resource availability status	Reason for restriction
St Bees	11.35	Water available for licensing	NA
Ehen/Calder	54.4	Restricted water available for licensing	Potential impacts on rivers Ehen & Calder
Holmrook	5.6	Restricted water available for licensing	Potential impacts on River Irt
Bootle	21.49	Water available for licensing	NA

Further information on how the aquifer behaves and how the assessment was completed is available in the final report.

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