



COTSWOLDS NATIONAL LANDSCAPE BOARD BRIEFING PAPER

UNCONVENTIONAL GAS PROSPECTIVITY OF THE COTSWOLDS AONB AND IT'S SETTING

National Landscapes are designated by the Governments as Areas of Outstanding Natural Beauty (AONBs) for the purpose of ensuring that the special qualities of the finest landscapes in England and Wales are conserved and enhanced. In policy terms they have the same planning status as National Parks.

The Cotswolds National Landscape Board is the body set up by Parliament to conserve and enhance the natural beauty of the Cotswolds AONB and increase the awareness and understanding of the special qualities of the AONB. The Board also has a duty to have regard to the social and economic needs of those who live and work in the Cotswolds.

This briefing paper addresses the potential impact of exploration and exploitation of unconventional hydrocarbons from the Cotswolds National Landscape and its setting

Unconventional hydrocarbons refer to gas and oil from unconventional sources trapped in impermeable rocks deep underground. Advances in drilling and wellsite technology and increases in wholesale prices for oil and gas now make production from the less permeable unconventional formations commercially viable.

Of principal interest is gas, particularly shale gas. About half of Britain including the entire Cotswolds National Landscape sits above geology described as 'potential source rock'. However, not all this geology will be productive. See Appendix 1 for further information on sources of unconventional hydrocarbons and the prospectivity of the Cotswolds National Landscape and its setting. There is no indication of oil reserves underlying the Cotswolds National Landscape.

Likely impact on the Cotswolds National Landscape

The Lias outcrop and subcrop¹ and the Oxford Clay outcrop associated with the Cotswolds are all described as 'immature' for shale gas and the underlying coal fields contain low volumes of methane whilst the prospectivity of the nearby Cambrian rocks in the Severn Vale is currently

¹ Outcrop – part of a body of rock exposed on the surface. Subcrop – part of a body of rock beneath another overlying rock.

unclear. It should be noted, however, that the resources underlying the Cotswolds are relatively unexplored.

Other areas of the Country contain much higher potential for extracting gas and more likely to be the focus for gas prospecting and extraction. The landscape impact of such sites will be helpful in determining the likely short and long-term effects on the Cotswolds National Landscape where exploration may be considered.

Conclusion

From information available at present the Board considers that the Cotswolds National Landscape and its setting can be seen as at low risk from exploration and exploitation of unconventional gas. However, this is a topic for which new evidence and guidance is forthcoming and will need to be kept under review.

Appendix 1 - Sources of unconventional hydrocarbons and the prospectivity of the Cotswolds National Landscape and its setting.

Sources of unconventional gas

Shale gas

Shale gas is extracted directly from shale and mudrocks. The most common way to extract shale gas is by cracking the rock using hydraulic fracturing ('Fracking').

Coalbed Methane (CBM)

As with shale gas, hydraulic fracturing is used to extract gas from unworked, undisturbed coal seams via boreholes drilled from the surface. Prior to gas production, the coal seam must be dewatered to lower the pressure allowing the release of gas.

Underground Coal Gasification (UCG)

Underground Coal Gasification (UCG) involves the gasification of the coal in-situ by drilling boreholes into the seam, injecting water/oxygen mixtures down one pipe, igniting and partially combusting the coal and extracting the gasification products through the another pipe.

Coal Mine Methane (CMM)

Coal Mine Methane is extracted from worked or abandoned mines traditionally as a safety measure. Methane is released by the coal and collects in the voids left by coal extraction. CMM has no relevance to the Cotswolds.

Prospectivity of the Cotswolds

Shale Gas

Jurassic Lias lies underneath the Oolitic limestone of the Cotswolds but also outcrops at the base of the scarp and in northern parts of the National Landscape. The lias associated with the Cotswolds is described as immature² for gas i.e. not enough time, pressure and heat to mature the Lias for gas production.

The Oxford Clay outcrop adjacent to the Cotswolds is also described as immature.

An outcrop of Cambrian shales lies in the Severn Vale, just west of the scarp at Stinchcombe Hill. It is unclear as to their prospectivity but there is a suggestion that underlying Cambrian shales in the Severn Vale may be a potential target.

² The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas
https://www.nstauthority.co.uk/media/1693/shalegas_uk.pdf

Oxfordshire-Berkshire Coalfield

The area of the Cotswolds National Landscape within Oxfordshire and the eastern edge of Gloucestershire around Stow-on-the-Wold overlies the Oxfordshire-Berkshire Coalfield.

Coalbed Methane

No coal has been mined from this Coalfield. The methane content is therefore considered as unprospective for Coal Bed Methane³.

Underground Coal Gasification

Areas of the Oxfordshire-Berkshire Coalfield have potential for Underground Coal Gasification (UCG). These areas include the coalfield south of Banbury and east of Witney. Large areas of the coalfield have unverified potential due to the lack of deep boreholes, however, the areas to the west of Oxford are known to have poor potential for UCG⁴.

Bristol and Somerset Coalfields

The Bristol and Somerset coalfields lie mostly adjacent to the Cotswolds National Landscape in the Severn and Avon vales but also underlie Bath and the southern end of the National Landscape.

Coalbed Methane

A borehole at Priston southwest of Bath and about 2½ miles west of the National Landscape boundary at Combe Hay found two coal seams that meet CBM criteria. The coalfields, however, are considered to have very limited potential for CBM as they contain low volumes of methane⁵.

Underground Coal Gasification

Examination of boreholes indicates there is no UCG potential in the Bristol-Somerset coalfields. Three seams, however, meet the thickness criteria locally and other thick coals may be present in the deeper parts of the coalfield⁶.

³ Mineral resource Information in Support of National, Regional and Local Planning – Oxfordshire

<https://www2.bgs.ac.uk/mineralsUK/planning/resource.html>

⁴ UK Coal Resource for New Exploitation Technologies, Final Report <https://www.bgs.ac.uk/download/uk-coal-resource-for-new-exploitation-technologies-report/>

⁵ Mineral Resource Information in Support of National, Regional and Local Planning – Somerset

<https://www2.bgs.ac.uk/mineralsuk/download/england/somerset.pdf>

⁶ UK Coal Resource for New Exploitation Technologies, Final Report <https://www.bgs.ac.uk/download/uk-coal-resource-for-new-exploitation-technologies-report/>