

Worcestershire County Council: September 2018

Salt and Brine in Worcestershire

Executive summary

Salt and brine are found in Worcestershire around Droitwich Spa and Stoke Prior and have been worked since the Iron Age. The last large-scale working closed in the 1970s following concerns about subsidence, but recent years have seen a return to brine extraction at a small scale for the production of salt, and there is outline planning permission for a brine bath adjacent to Droitwich Spa lido.

It is unclear whether salt and brine resources in Worcestershire will ever again be workable or commercially attractive at a large scale.

Any proposed new salt or brine workings would need to demonstrate that they would not create or be affected by unacceptable ground instability and subsidence. The Council does not currently have any information to suggest whether these issues could be overcome.

Contents

Executive summary	2
1. Introduction to salt and brine	4
Why is it needed and what is it used for?	4
2. Where are salt and brine found?	5
3. The history of workings in Worcestershire	7
Droitwich Spa	7
Stoke Prior.....	8
4. Planning context.....	8
National planning context	8
Local planning policy	8
5. Planning issues for salt and brine.....	10
Hydrology	10
Geological and nature conservation	10
Emissions – noise, dust and vibration.....	10
Visual impacts	11
Transport.....	11
Climate change.....	11
Ground stability and subsidence.....	11
6. Conclusion	12

1. Introduction to salt and brine

- 1.1. Salt is extracted in two forms from the earth: as a solid called *rock salt* (or halite), and also as a liquid known as *brine*.
- 1.2. Brine is created where ground water percolates through and dissolves rock salt. Brine contains approximately 2.5lbs of salt per gallon, which is roughly ten times the proportion of salt found in sea water.
- 1.3. Rock salt is extracted by the 'pillar-and-stall' method. This is a traditional mining method in which salt pillars are used to support the ceiling of shallow underground cavities and tunnels where the excavation takes place¹. This has very little effect on the surface, except in the cases where the cavities or tunnels collapse and subsidence occurs.
- 1.4. For brine extraction, a modern brine pump involves a double pipe inserted

⁷ Cooper, A H (2002) Halite karst geohazards (natural and manmade) in the UK

3. The history of workings in Worcestershire

Droitwich Spa

- 3.1. There is possible evidence of pre-Roman workings in the form of an Iron Age brine boiling spring hearth¹⁴ at the Upwich brine spring in Droitwich Spa. During the Roman era Droitwich Spa was known as *Salinae*, which indicates its early associations with the extraction and distribution of salt.¹⁵

the town. Outline planning permission was granted in 2017 for development including a brine bath adjacent to Droitwich Spa Lido²².

Stoke Prior

- 3.6. Stoke Prior, the other main Worcestershire salt works, continued to exploit the resource after the Droitwich Spa works had closed. These works had received heavy investment since the 1830s when a large deposit of rock salt had been discovered. Extraction quickly changed to brine, however, due to the characteristics of the deposit. The works incorporated salt and chemical works and a soap reW*n7(Sto)4 ((-D[046 (d 1 (d)2)4 (4.3 6d[1 121 595341 842.

Worcestershire, but that presently, and in the foreseeable future, salt will not be commercially exploited²⁹. However, the new Minerals Local Plan will supersede the adopted Hereford and Worcester Minerals Local Plan, and it will need to consider the commercial viability and sustainability of the mineral resources in Worcestershire.

²⁹ Worcestershire County Council Adopted Minerals Local Plan, paragraph 1.4.

5. Planning issues for salt and brine

- 5.1. The majority of activities associated with salt extraction are underground and remain unseen. However there are particular characteristics of salt extraction that have environmental implications.

Hydrology

- 5.2. Brine extraction in Worcestershire has had an impact on groundwater in the past, however, the new ground water exemption policy from the Environment Agency includes saline abstractions from the Cheshire brine fields. These are specific exemptions that also allow certain types of dredging operations and certain abstractions within water meadow systems³⁰. If the brine fields were to be re-exploited in Worcestershire abstraction would almost certainly be less than at the current Cheshire fields. However, care would be required assessing the specific local impact to the area's groundwater and aquifers.

Geological and nature conservation

- 5.3. In the UK, the Geological Conservation Review (as part of the Department of Environment, Food and Rural Affairs) has been developed 'to provide a public record of the features of interest and importance at localities already notified or being considered for notification as 'Sites of Special Scientific Interest' (SSSIs). The sites selected – GCR sites – form the basis of statutory geological and geomorphological site conservation in Britain³¹.
- 5.4. The sites that have been selected have the potential to be used for scientific, education, training, economic, leisure and aesthetic purposes³².
- 5.5. Salinity levels have dropped around the Salwarpe Valley and Terraces since the 1960s, and several halophytes are now extinct. Any potential effects on the nature conservation interest of habitats in and around proposals for brine or salt extraction would need careful consideration.

Emissions – noise, dust and vibration

- 5.6. Mineral extraction can result in adverse effects on surroundings unless the operation is properly controlled and the site appropriately restored. These impacts could include noise, dust and vibrations.
- 5.7. Noise and dust emissions are more likely to occur from rock salt workings than from brine extraction. Rock salt mining may involve blasting which can cause some emissions, although this is likely to be below the level that would cause structural damage at the surface.

³⁰ Environment Agency (2010) Managing Water Abstraction.

- 5.14. Modern management and extraction techniques are also more likely than historic methods to enable design and operation which minimises the risk of subsidence.

6. Conclusion

- 6.1. Based on the best information the Council is aware of, it is unclear whether salt and brine resources in Worcestershire are likely to be workable or commercially attractive at a large scale.
- 6.2. There could also be serious implications associated with new salt or brine workings which would need to be satisfactorily addressed, particularly in relation to ground stability and subsidence. The Council does not currently have any information to suggest whether these issues could be overcome.