



The Coal
Authority

The Gateshead mine water heat scheme

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The Coal Authority

Kept people safe
and provided
peace of mind



We carried out
8,370
mine entry inspections



We investigated
589
surface hazard reports



We assessed
212
subsidence
damage claims

Used our
information and
expertise to help
people make
informed decisions



We delivered
195,371
mining reports



We issued
1,704
permits to
intersect coal



We provided
7,599
planning consultation
responses

Protected and
enhanced the
environment



We treated
122 billion
litres of water



We replaced
32,000m²
of our 350,000m²
reed beds



We prevented
4,540
tonnes of iron solids from
entering water courses

Created value and
minimised cost to
the taxpayer



We saved
£2.4 million
by recycling
reedbed material



We generated
£6 million
of income through our
advisory services

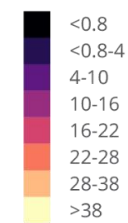


We recycled
78%
of removed iron solids

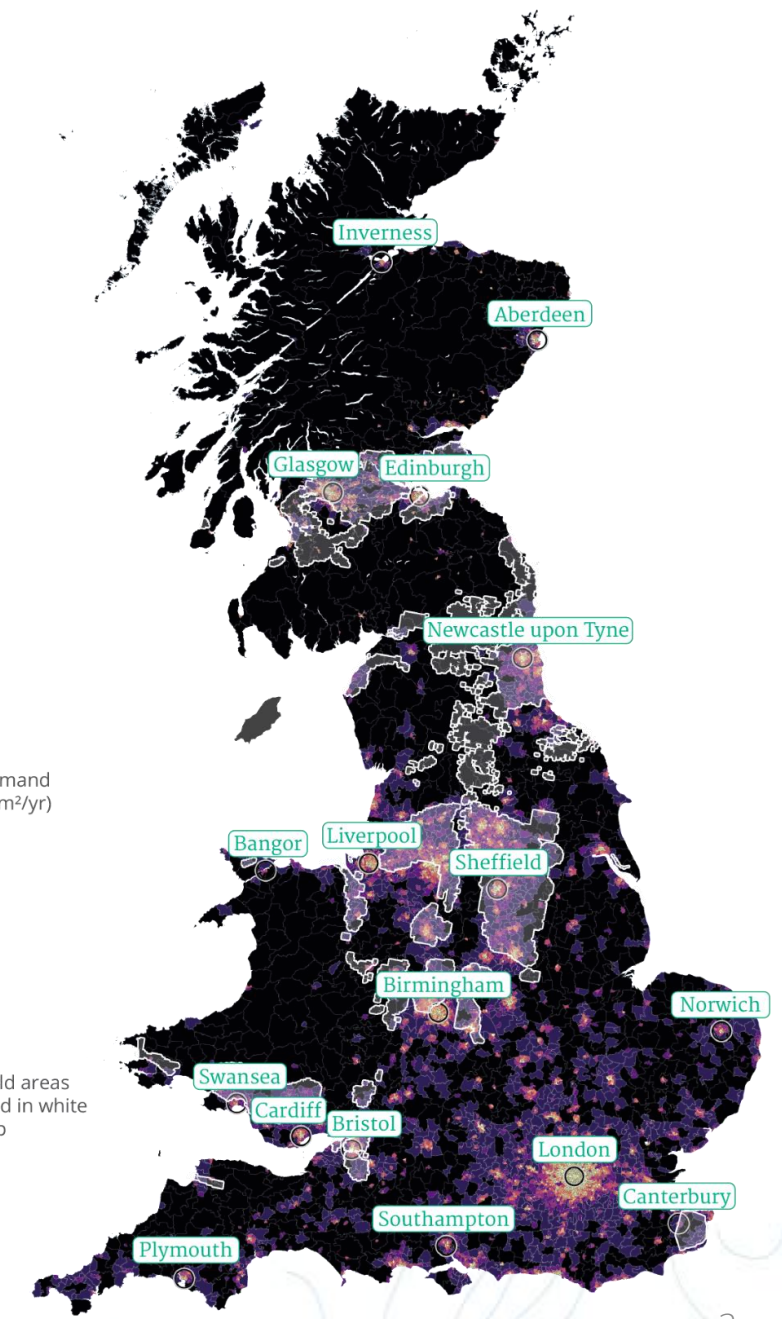
Coal Mining in GB

- Coal has been extracted from 23,000 collieries
- Majority of coal mines are now closed, with access shafts filled and capped
- The Coal Authority owns the below ground infrastructure and coal reserves on behalf of UK Government
- 25% of GB properties on Coal Mine Reporting Area (green area on map)

Annual Heat Demand Density (GWh/km²/yr)



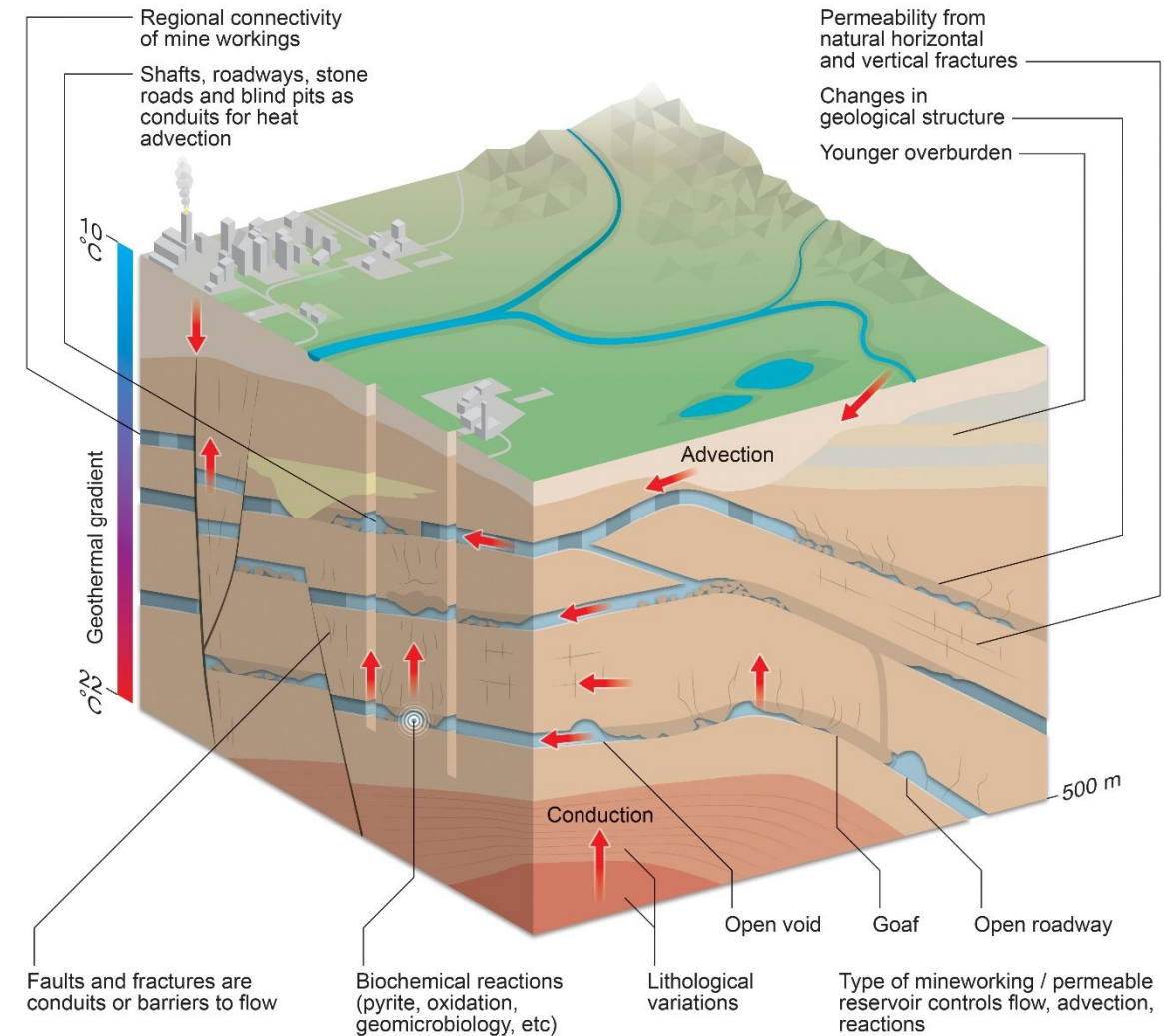
Coalfield areas outlined in white on map



Heat demand map taken from BEIS' 2021 study, Opportunity Areas for District Heating Networks in the UK. Map shows demand by Middle Layer Super Output Area (England and Wales), Intermediate Zone (Scotland). Contains OS data © Crown copyright and database right 2021. Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com.

Considerations

- **Feasibility**
 - Age and depth of workings
 - Accuracy of mine plans
 - Connections
- **Drilling**
 - Experience in coalfields
 - Ability to deviate to hit targets
 - Coal mine gas
- **Pumping tests**
 - Water chemistry – aggressive/Fe rich?
 - Achieve sustainable yields & return?
 - Hydraulic properties of old workings



Produced by BGS for ©Coal Authority 2022

CASE STUDY: Gateshead – Feasibility

- Heat Network for Gateshead Council / Gateshead Energy Company
 - £15.2m scheme with £5.9m of HNIP
 - BH and Heat pump ~£4m
- CA facilitate boreholes and testing
- Located and to be connected to existing CHP heat network
- First heat network scale mine water source network in UK (6MW)

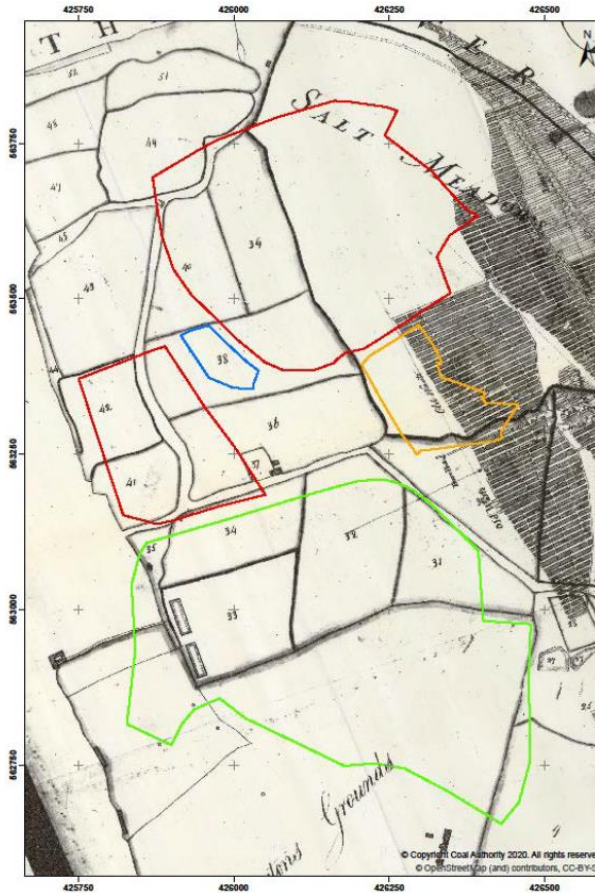


Gateshead Council and Coal Authority Staff at the Gateshead Energy Company CHP building ©Coal Authority 2022

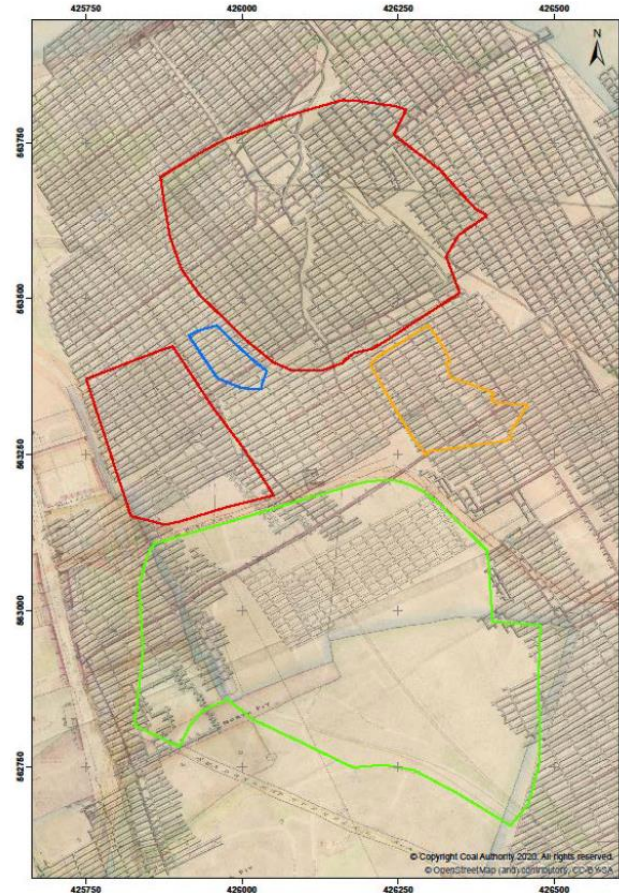
CASE STUDY: Gateshead – Feasibility

- Commissioned Nov 2019
- Heat Network for Gateshead Council

Seam	Shearlegs Road Depot	Gateshead Energy Centre	Baltic Business Quarter (SE)	Baltic Business Quarter (NW)	Exemplar Neighbourhood
High Main (E)	Recorded and Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded
Main (F)	No	No	No	No	No
Yard (G)	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded
Maudlin (H)	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded
Six Quarter (Low Main) (J)	Possible unrecorded	Recorded and Possible unrecorded	Recorded and Possible unrecorded	Recorded and Possible unrecorded	Recorded and Possible unrecorded
Five Quarter (Brass Thill) (K)	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded	Possible unrecorded
Hutton (Low Main) (L)	Recorded	Recorded	Recorded	Recorded	Recorded and Possible unrecorded
Harvey (N)	No	No	No	No	Recorded



High Main Plan -Gateshead Park Colliery (Ab. 1786)



Low Main (Hutton) Tyne Main Colliery (Ab. 1926)

CASE STUDY: Gateshead – Exploratory and Production Drilling

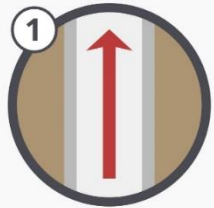
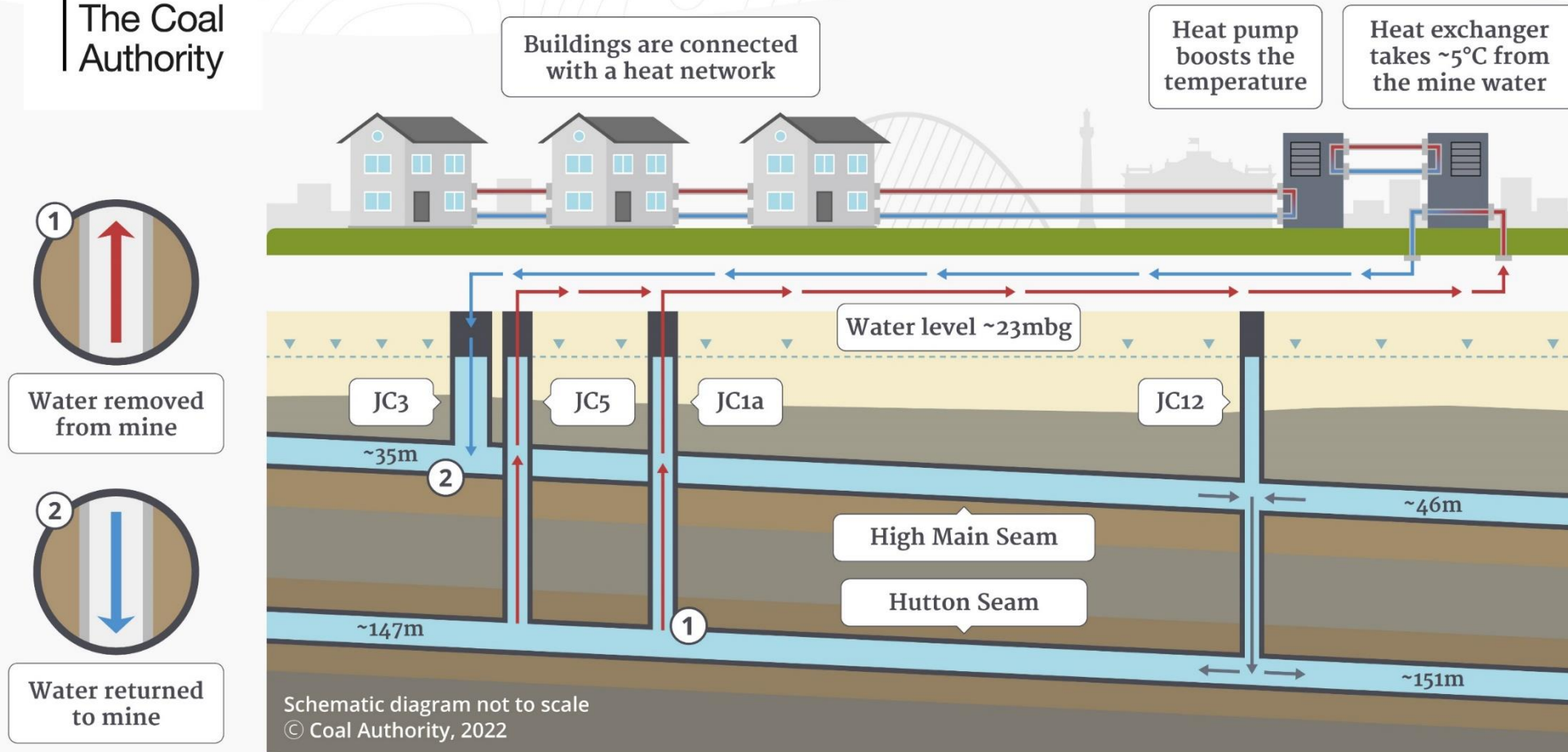


- Abstraction ~150m deep (Hutton Seam)
- Return ~ 50m deep (High Main)
- Multi-seam borehole

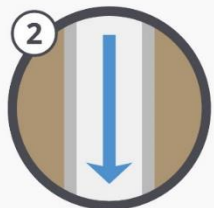
CASE STUDY: Gateshead – Conceptual Model



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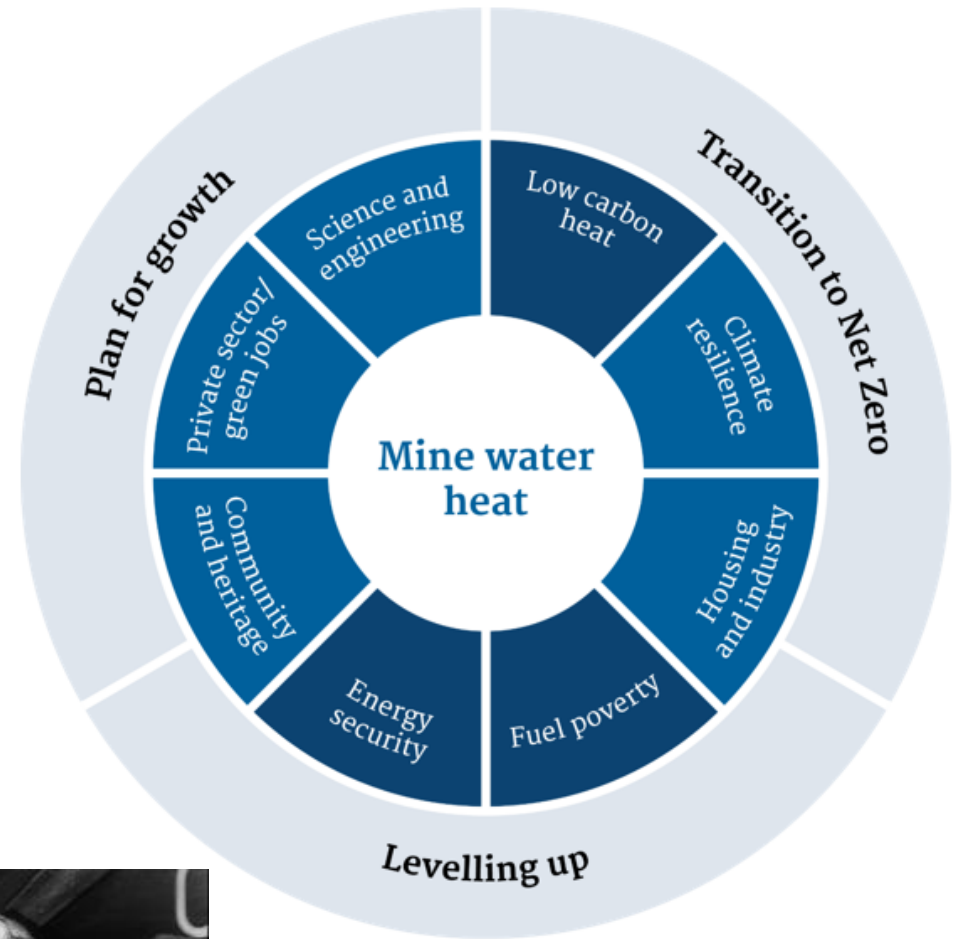
Water removed from mine



Water returned to mine

To Conclude

- Aligns with many government strategies
- Low carbon and uses available technology
- An opportunity to repurpose a legacy
- Share with other mining regions as part of just transition
- One size does not fit all





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Thank you

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