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Proposed measures to clean up the River Nent

April 2016:

- we held an open community event where the initial proposal was presented. The proposal was withdrawn and a new engagement approach was developed

October 2016:

- we held 2 community events where open discussions took place about the new approach to finding alternative land areas. The site evaluation criteria identified

November 2016 - March 2017:

- providing information - questions answered
- developing site evaluation criteria
- wider letter drop, contacting businesses, contacting wildlife groups
- contacting landowners
- extended search area
- potential areas identified that might be suitable for a mine water treatment scheme

March 2017:

- discussions with stakeholders on identified new areas



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Why do we need to clean up the River Nent?

Mining has taken place around the River Nent for hundreds of years. The many inputs of metals from numerous abandoned mines cause severe damage to river insects and fish in the River Nent. The water and sediment quality is impacted all the way to Newcastle.

Most of the zinc and cadmium comes from the mine water discharges ('levels') which flow all year round. However, when the river flow is higher after rainfall, more of the zinc and cadmium, and most of the lead, comes from the waste heaps and river sediments. So the amount of pollution, and where it comes from, changes a lot.

At Alston, average metal concentrations in the Nent are many times the levels which cause harm to river wildlife:

Zinc = 57 x higher
Cadmium = 28 x higher
Lead = 3 x higher

Haggs Level
Zinc: 20-45%
Cadmium: 11%

Brownley Hill Level

Proposed sediment trap
Nent Hall Hotel

Croft Level

River Nent

Rampgill Level
Zinc: 20-45%
Cadmium: 2%

Nenthead

Waste heaps

Caplecleugh Level
Zinc: 45%
Cadmium: 19%

Nent Force Level

Alston

River South Tyne

River flow

Treating the mine waters and managing the mine waste heaps will remove metals from the river and improve the environment for wildlife and people

Environment Agency data from 2014 to 2016

Typical % of total pollution at Alston

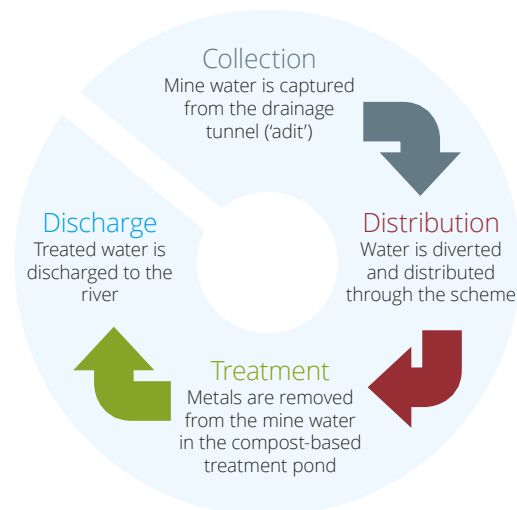


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Design features

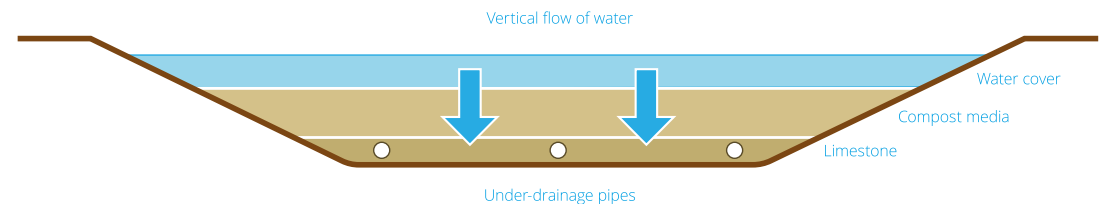


The wetland at Saltburn mine water treatment scheme

Compost based treatment ponds

These treatment ponds harness natural processes within the compost mixture to remove metals from mine water without needing to add chemicals or energy. Naturally occurring bacteria convert sulphate in the mine water to sulphide. The sulphide generated reacts with metals dissolved in the mine water to form solids. These solids are then bound up in the compost and removed from the water.

After passing out of the compost-based treatment pond, the water will go through an aerobic wetland before being discharged into the river.



Other similar schemes

The Coal Authority has over 20 years' experience in preventing and treating water pollution from abandoned mines.

Its metal mine water treatment scheme at Force Crag in the Lake District has been operating since 2014. It has been very effective in removing high amounts of zinc, cadmium and lead before water reaches the Coledale Beck.



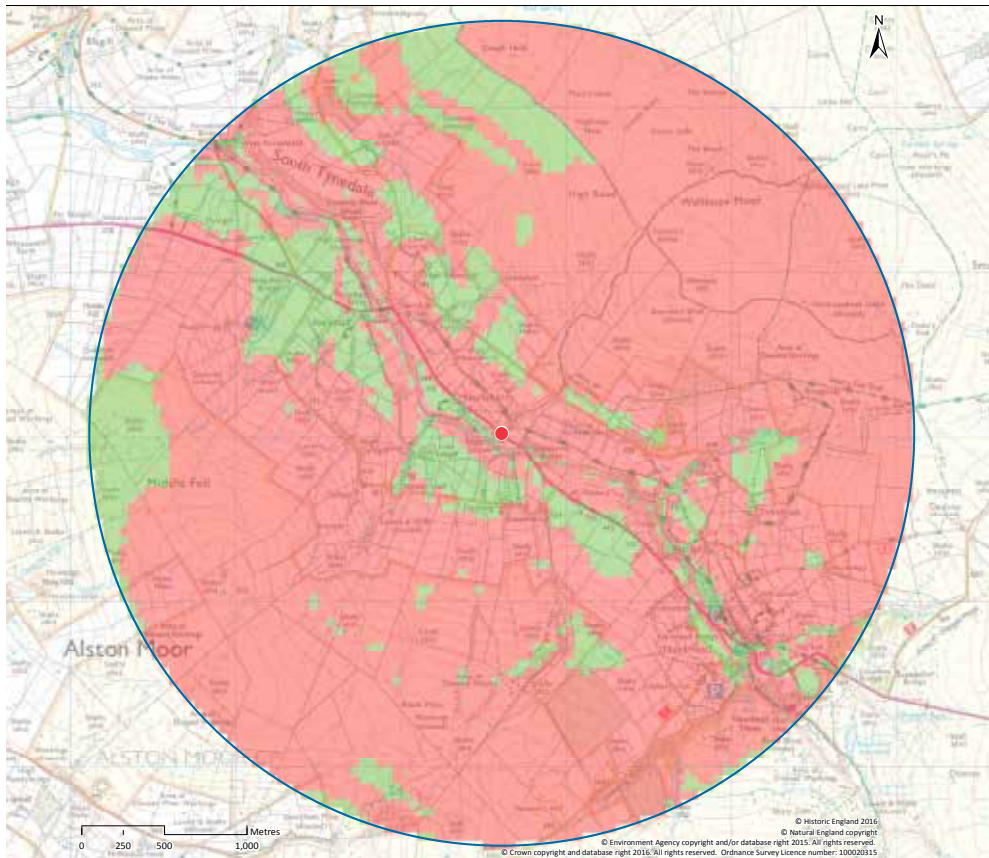
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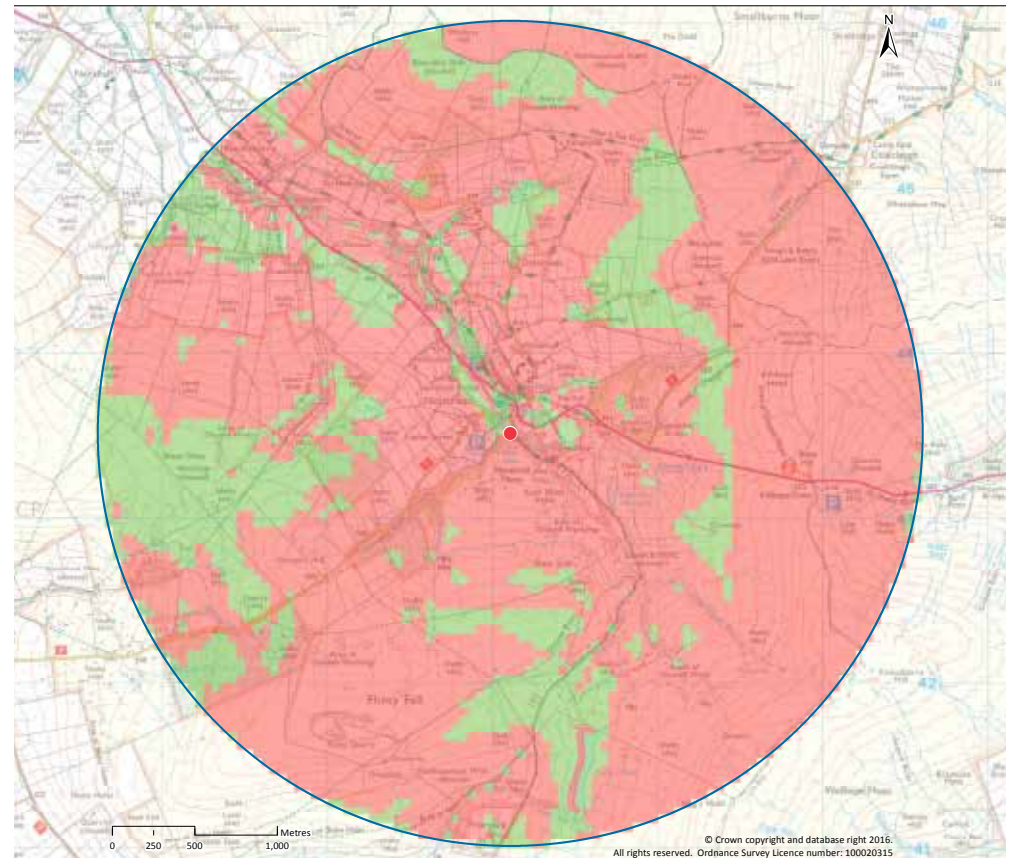
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Maps

Nent Hagg



Caplecleugh and Rampgill





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Site evaluation criteria

Criteria

- a) Access to the potential treatment site (closest boundary)
- b) Closeness to housing & businesses (from site boundary to nearest building)
- c) Distance from the mine water discharge point to the potential treatment area (closest boundary to discharge point)
- d) Pumping costs and carbon footprint (average across elevation the whole area)
- e) Site size

Caplecleugh and Rampgill

(flow: 30 litres per second – subject to change following further data collection)

Caplecleugh only

(flow : 20 litres per second – subject to change following further data collection)

Rampgill only

(flow: 10 litres per second- subject to change following further data collection)

Haggs

(flow: 15 litres per second – subject to change following further data collection)

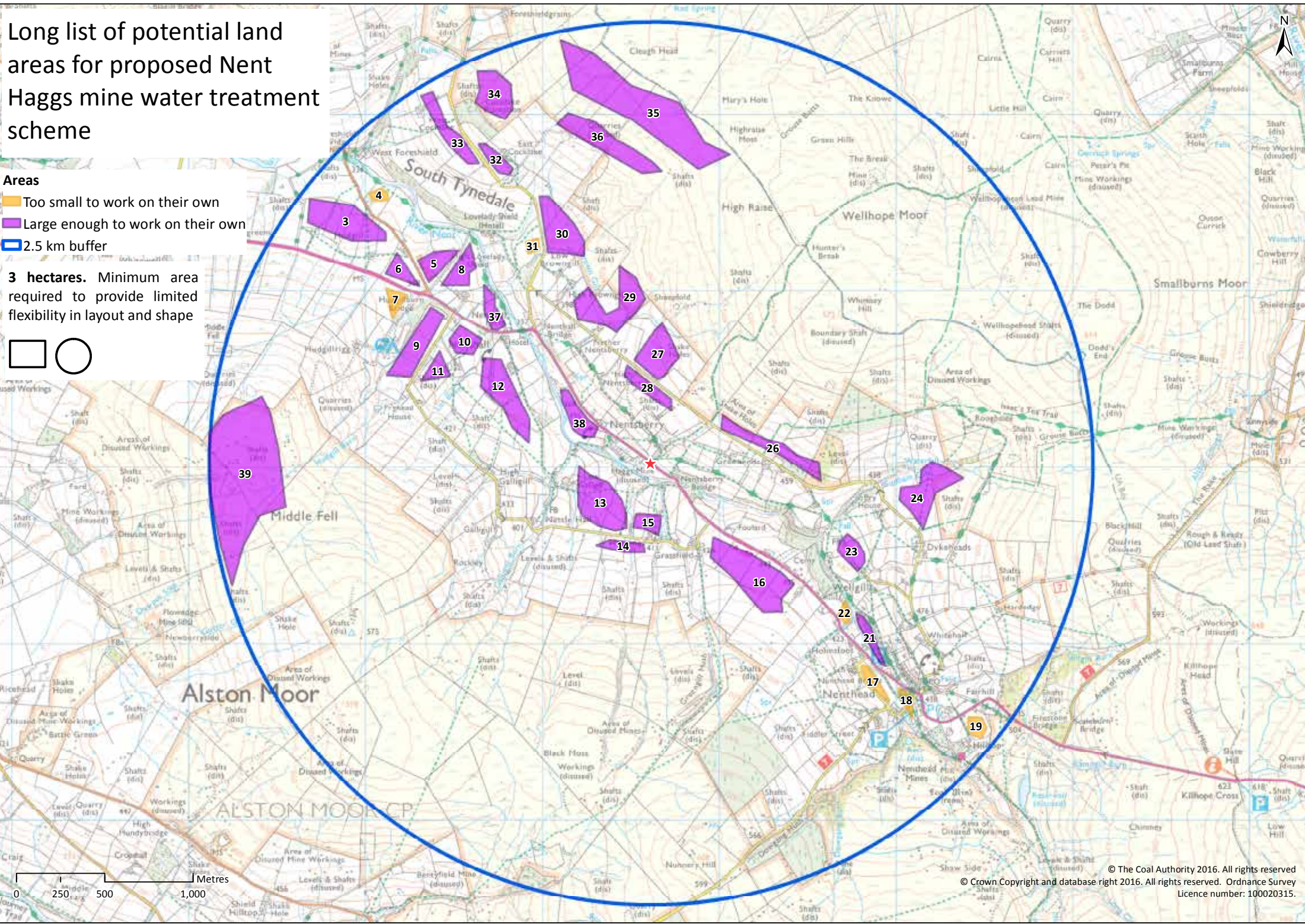
- f) Current and previous land use –ease of construction (average across the whole area)
- g) Degree of slope (average across the whole area)
- h) Ecological issues (average across the whole area)
- i) Flood risk - surface water flooding (average across the whole area)
- j) Route of the pipeline to transfer the mine water to the potential treatment area and then from the potential treatment area to a nearby watercourse. (total pipe length)
- k) Visual impact

Long list of potential land areas for proposed Nent Hags mine water treatment scheme

Areas




- Too small to work on their own
- Large enough to work on their own
- 2.5 km buffer

3 hectares. Minimum area required to provide limited flexibility in layout and shape

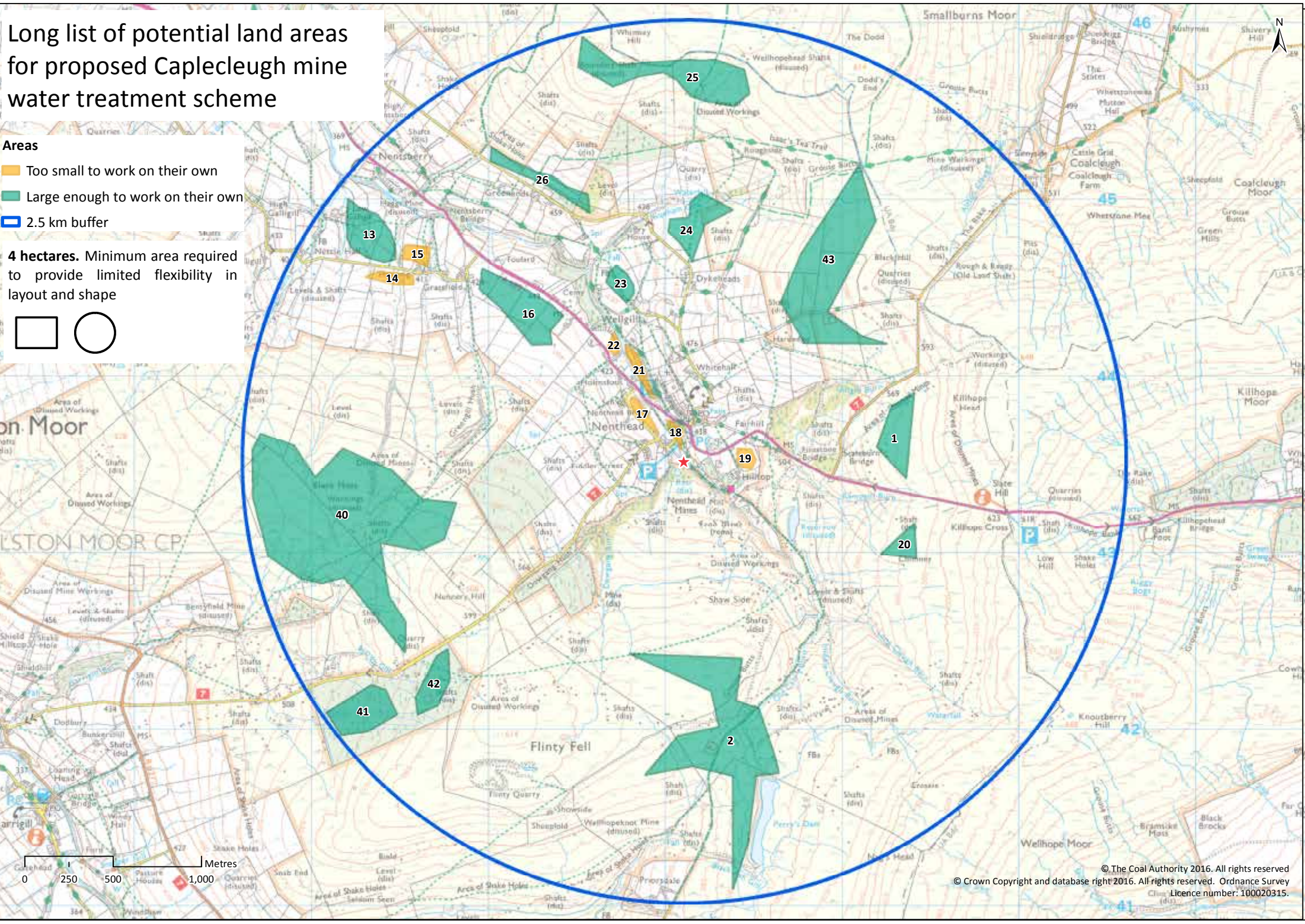


Long list of potential land areas for proposed Caplecleugh mine water treatment scheme

Areas

-  Too small to work on their own
-  Large enough to work on their own
-  2.5 km buffer

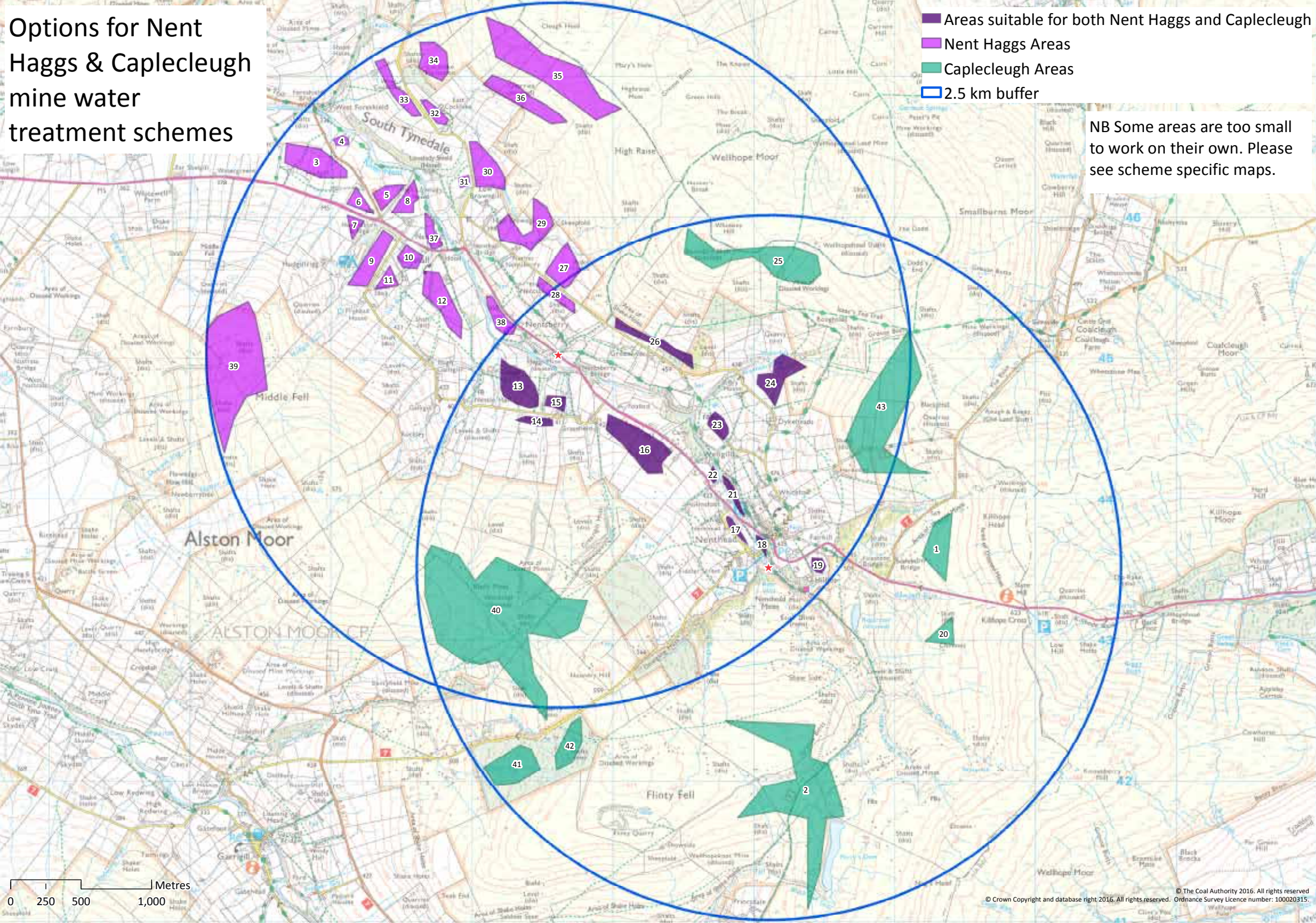
4 hectares. Minimum area required to provide limited flexibility in layout and shape



Options for Nent Hags & Caplecleugh mine water treatment schemes

- Areas suitable for both Nent Hags and Caplecleugh
- Nent Hags Areas
- Caplecleugh Areas
- 2.5 km buffer

NB Some areas are too small to work on their own. Please see scheme specific maps.





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River Nent sediment traps

The sediment in both the Rivers Nent and South Tyne is heavily contaminated with metals like lead, cadmium and zinc. We can capture this sediment using sediment traps which work by creating deeper pools which slow the river flow. This encourages the sediments (and metals) to settle to the bottom. Once the pools are full of sediment, we can carefully dig them out and remove the metals for safe disposal.

The sediment comes from solids washing off waste tips into the river and by dissolved metals from mine water discharges settling out at low flows. It can be picked up and carried further down the river when flow increases.



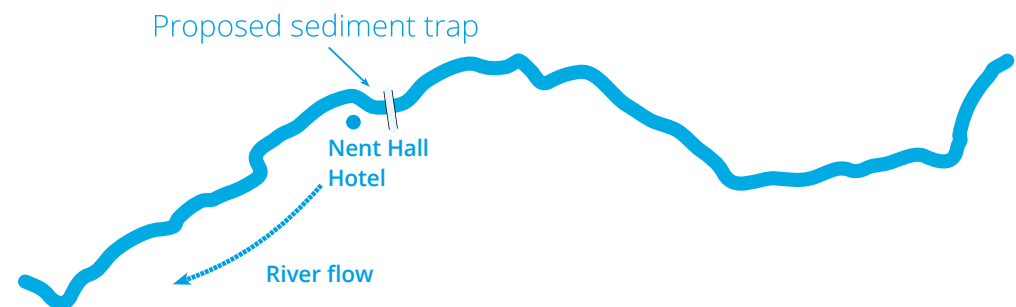
Example of existing sediment trap near Nenthead

Nenthead sediment traps

340 tonnes of sediment containing about 7 tonnes of lead, zinc and cadmium was removed from the existing sediment traps near Nenthead in March 2016. We hope to clear more sediment in 2017.

Proposed sediment trap near Nenthall

We plan to install a new sediment trap upstream of Nenthall. This would capture 1 to 2 tonnes of zinc, cadmium and lead each year behind the trap and on the flood plain.





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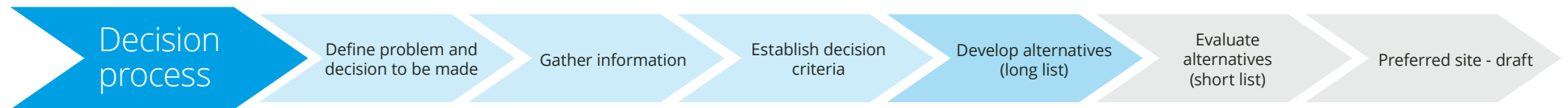


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Engagement process

Engagement objective

To work with stakeholders to find an acceptable way of treating polluted mine water from the Haggs, Caplecleugh and Rampgill Levels, from concept through to operation.



Progress so far:

- we've extended the search area
- we've applied the evaluation criteria
- we've identified potential areas that might be suitable for a mine water treatment scheme

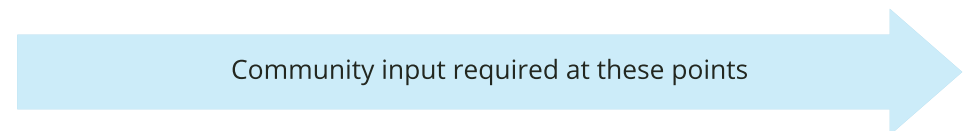
Next steps:

- identify potential areas to take forward for further assessment

The areas for further consideration will depend on:

- scores from the evaluation process
- views of residents and stakeholders
- land availability

Oct/Nov 2016 Agree search area Develop evaluation criteria Gather additional data	March 2017 Review 'long list' Comment on evaluation and scores Identify areas to be shortlisted for assessment	May/June 2017 Review 'short list' sites Comment on advantages/disadvantages of each site Identify preferred site	Sept/Oct 2017 Review of draft design for preferred site Discuss layout, shape and landscaping Discuss operational issues relating to preferred site	Oct/Nov 2017 Review of final design for preferred site Review construction activities Review operational activities
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Online information

The following information is available on line at the addresses below:

- Site evaluation criteria for proposed mine water treatment schemes on the River Nent
- Odour control and abatement in metal mine water treatment schemes
- Statement on the potential for mosquito and midge infestations at metal mine water treatment schemes
- A summary of the environmental and economic benefits of cleaning up mine water discharges in the River Nent and River South Tyne
- River Nent water quality catchment characterisation studies

WAMM Programme

<https://www.gov.uk/government/collections/metal-mine-water-treatment>

Haggs / Caplecleugh

<https://www.gov.uk/government/publications/haggs-mine-water-treatment-scheme>



Your opinion

Please tell us which areas you feel should be taken forward and evaluated in more detail

Areas for evaluation in more detail

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Comments:

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Areas not suitable for more detailed evaluation

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Comments:

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Home postcode

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Please complete and email to

nent@coal.gov.uk or post to the Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG