



1973

## The Story of Boulby Potash Mine

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The mid-19th century saw a boost to the Industrial Revolution in northeast Yorkshire, when Messrs. Bolckow and Vaughan (B&V) stumbled upon near-horizontal beds of iron ore in the Eston Hills, to the south of the River Tees, in 1850.

Events accelerated fast, commencing with the establishment by B&V of an iron-works in what came to be the town of Middlesbrough. The iron-steel works needed fresh water, as opposed to the tidal (and therefore saline) water of the Tees estuary. The new company directors decided that a borehole on their own ground would be the safest bet, so commenced drilling in 1867. The drilling was relatively straightforward for the first 750 feet, but with little sign of water. Then, to everyone's initial pleasure, copious quantities of water were intersected at less than 1,000ft depth. But soon pleasure turned to despair; the water was in fact saturated saline brine, in a 100ft-thick bed of pure salt.

The next chapter in the story was the realisation by local entrepreneurs that this salt-bed had huge industrial potential. Several new boreholes were drilled to exploit the salt layer by 'solution mining' (when water is pumped underground to dissolve the salt and then returned to the surface). Salt extraction led to patchy surface subsidence in the area now known as Saltholme. Initial dismay at this

turned to environmental approval: the whole area, with its many shallow freshwater ponds, has become an important bird reserve.

The salt (halite) and its associated beds ('evaporites') were formed by the evaporation of a vast sea which stretched from Yorkshire to Poland and beyond over 250 million years ago. These were the founding resource for ICI and other chemical companies which became large enterprises over the next century.

The next significant chapter began in 1938, when a borehole was drilled for oil and gas at Sleights, near Whitby. It was remarkable because it intersected, at much greater depth, the same 'evaporite' beds, which here included potassium salt layers, which did not occur at Saltholme. ICI had already become a major producer of agricultural fertilisers and recognised the potential of these beds - if only the expertise could be found to reach the depths at which they occurred (over 3,000ft).

World War 2 now intervened, and the new potassium minerals - including the newly discovered polyhalite - were treated for the time being as geological curiosities. After the war, interest in extracting them resumed. Salt-beds traditionally are regarded as potential traps for oil and gas reservoirs beneath them, and agreements were therefore reached in the late 1950s and

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early 1960s to allow oil companies to deepen any boreholes drilled by ICI in an area from Newton Mulgrave to Loftus, where the potash (i.e. potassium-bearing) beds were less deep than those at Sleights.

The geological guesswork turned out to be sufficiently accurate to allow ICI to search for a partner familiar with sinking deep shafts. The partner chosen, in 1967, was Charter Consolidated Limited (CCL), which took over the exploration drilling programme and established an office at Easington, near Loftus.

Several more boreholes were drilled, which established that the potash beds were continuous, extending out under the North Sea. These showed that the likely reserves would be sufficient to justify a major mine. Considerable thought was given to the best place for siting it, with its two deep shafts (over 3,500ft), its large processing plant, access to the sea for salt-water for the processing, and access to transport for over a million tonnes of potash product per year to a deep-water port. The site

chosen was close to the sea at the old Alum mining hamlet of Boulby, west of Staithes, which was also on the recently closed coastal railway. Securing planning permission, in an area of high unemployment following the closure of the iron ore mines, was relatively straightforward. Work began on sinking the shafts in 1969, almost exactly a century after the discovery of the salt-beds on Teesside, and commercial potash production began in 1973.

Ownership was transferred to Israeli Chemicals Ltd (ICL UK) in 2002. The mine now covers 200 hectares and produces half the UK's output of potash, used as an agricultural fertiliser. The rock-salt extracted as a by-product is used for gritting roads in winter conditions.

The site also hosts the Underground Science Laboratory, at 1,100m deep, where experiments can be carried out free from the cosmic radiation which constantly bombards the surface of our planet. The Laboratory is run by the Science & Technology Facilities Council in partnership with ICL UK.



### Find out more

ICL UK, <http://www.icl-uk.uk/>

Boulby Underground Laboratory,  
<https://www.stfc.ac.uk/about-us/where-we-work/boulby-underground-laboratory/>



*Boulby Potash Mine, near Staithes*