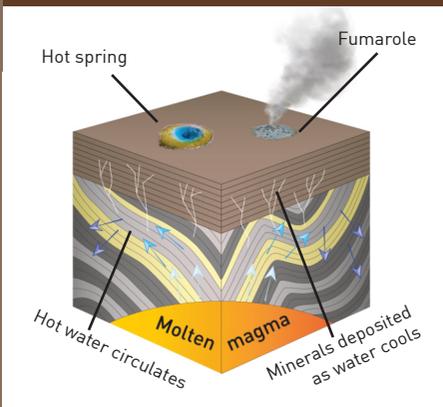


# Trail 6: Sand Lodge

The magma body that caused the Muckle Hell vent breccia and carbonatite also created hydrothermal veins further afield. Hydrothermal veins are formed by hot water circulating through pores and fissures, and dissolving minerals from the surrounding rock. As the water moves away from the source of heat it cools and the dissolved minerals crystallise out to form mineral veins. In this way the circulating water concentrates elements that were previously dispersed through the rock, and hydrothermal veins can be valuable sources of metal ores.

Vein formation



Below Sand Lodge, two wide, almost vertical, veins have been exposed by erosion. The veins, which join up beneath the surface,

are mainly composed of calcite (calcium carbonate) and ankerite (iron-calcium carbonate), with smaller amounts of other minerals, most importantly chalcopyrite (iron-copper sulphide). To the east of the old mine buildings, which now serve the nearby farm, one of the veins has been eroded to form a small geo **1**, which was used in the past as a berth for boats to

load ore. The bottom of the geo is formed of pale-coloured carbonate minerals, fingers of which extend out into the surrounding darker

Sandlodge vein material



sandstone. Samples of material mined from deeper in the vein can be seen along the top of the wall around the cliff top **2**. In the part of the vein exposed to the air, the chalcopyrite reacted with oxygen and water to produce haematite (iron oxide) and malachite (copper carbonate). These were carried downwards by rainwater draining through the rock and so became concentrated in the upper part of the vein as, over millions of years, the ground surface was lowered by erosion.

Malachite is an important source of copper, and its discovery at Sand Lodge in the late eighteenth century led to a long-lived, but ultimately unsuccessful, mining operation. The first shaft was sunk in 1789 and, working malachite and haematite in the enriched upper part of the vein, it would have appeared a promising venture.

Malachite



By the time the mine reached a depth of 30 metres, though, these ores were exhausted and only sparse chalcopyrite was left.

Several entrepreneurs tried over the years to develop the mine but most went bankrupt, and the operations finally closed in 1929.



## Directions

By car/bike: Return to the main A970, turn right and head north for approximately 19km (12 miles). Take the second (northernmost) of the two junctions signposted to Sandwick/Hoswick. Follow the road for approximately 0.5 miles (1 km), taking the junction on the left signposted to Mousa Broch. At the bottom of the road there is car parking by the shore, next to the Sandsayre Interpretive Centre.

On foot, follow the coast around the walls of Sand Lodge.

## Access



- Wheelchair access to Sandsayre Interpretive Centre and Hoswick Visitor Centre.
- The coastal path may be wet/muddy in places

## Interpretation

- Information panel in Sandsayre Interpretive Centre (by car park).
- Information panel at Hoswick Visitor Centre

## Facilities



- Toilets at Sandsayre Pier and Hoswick Visitor Centre
- Food and toilets available at Hoswick Visitor Centre

## Glossary

**Ore:** natural rock that contains metals or other desirable minerals that can be extracted from it.