

Cumberland Geological Society
The Windermere Supergroup
April 2026

Geologists' Association Guide No.77, Cumbria, Volume 2, Westmorland and Furness

Ordnance Survey OL6, The English Lakes - South Eastern, 1:25 000

Ordnance Survey OL7, The English Lakes - South Western, 1:25 000

This excursion is based on Itinerary 2.3 of the Geologists' Association Guide No.77, Cumbria (Prof Ben Kneller). Participants are recommended to have a copy of the itinerary with them on the trip.

We will visit Locations 1-5 in the Coniston area to examine sediments of Ordovician - Silurian age (Figure 1). The total walking distance for the circular part of the excursion is about 6.5 km, and is not overly strenuous, but may be wet underfoot after heavy rain (Figure 2).

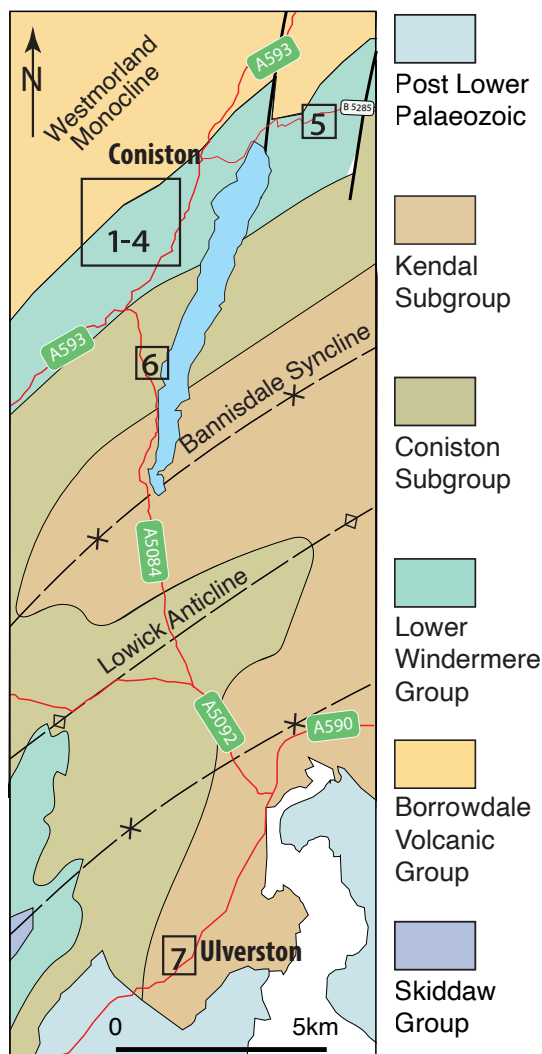


Figure 1. Generalised geological location map showing main roads and the positions of the localities covered in this excursion and the routes between them.

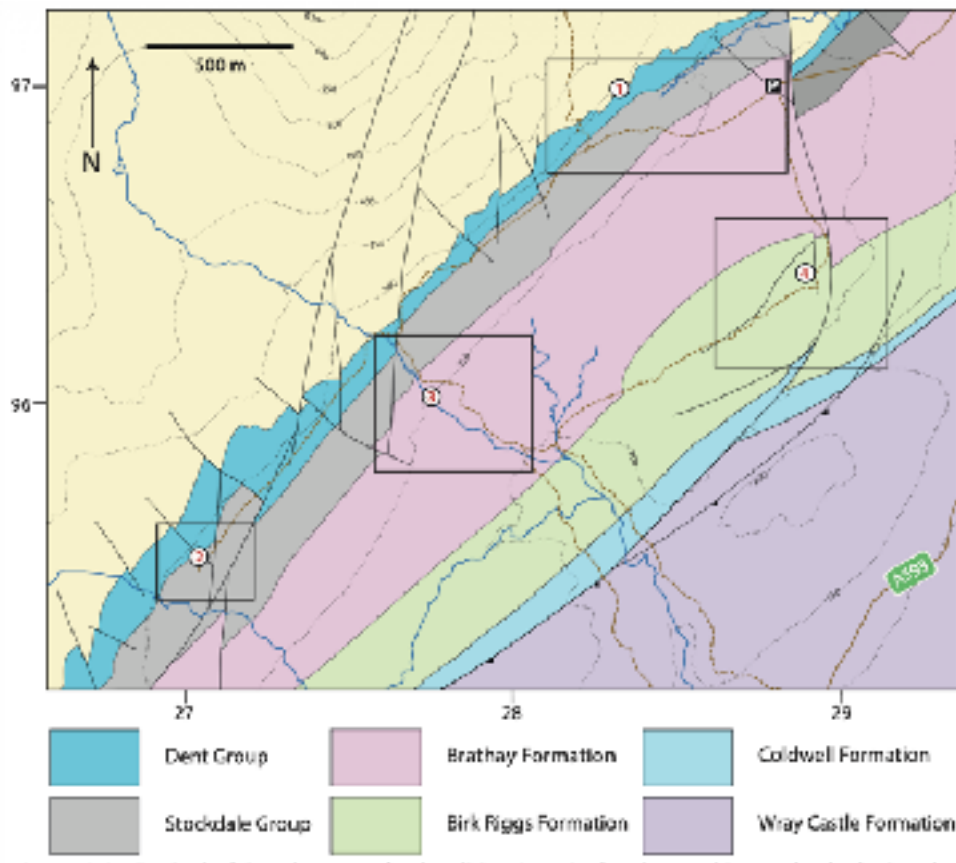


Figure 2. Geological location map for localities 1 to 4, showing parking and principal paths/tracks indicated by broken brown lines. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)

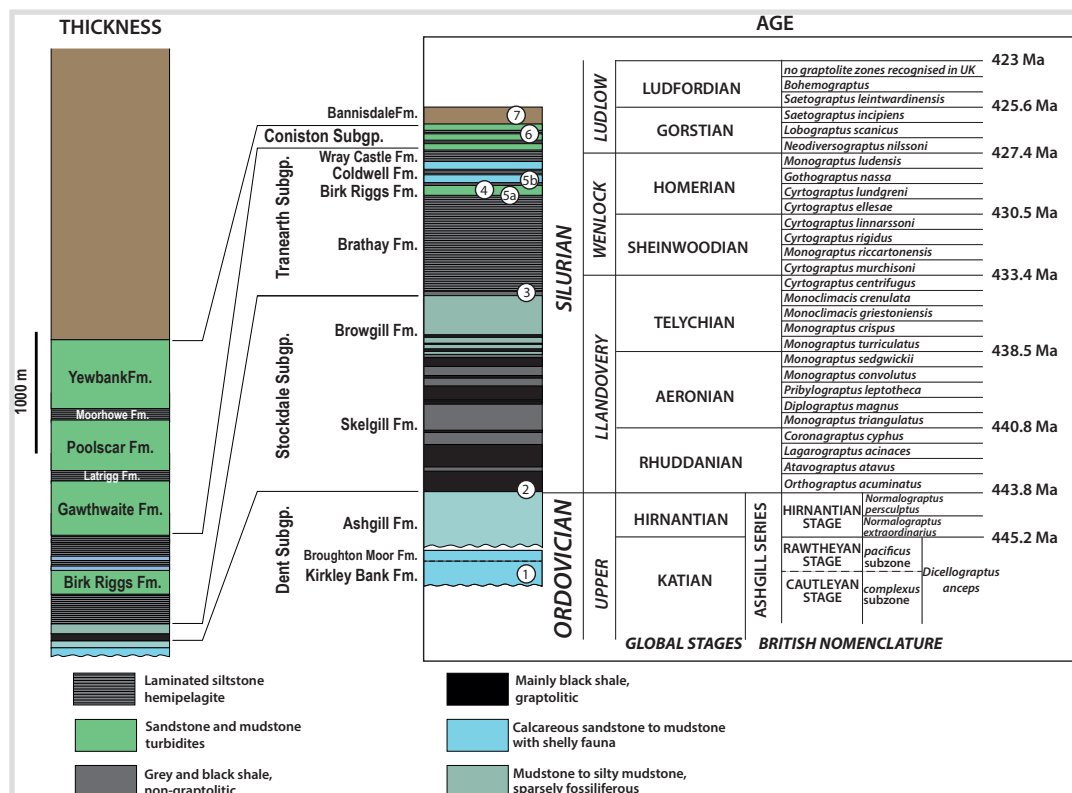


Figure 3. Stratigraphic column for the Windermere Supergroup, with thickness in approximate proportion to time interval of deposition. Ages according to the internationally recognised stages are shown in the right, also showing the British stage names for Late Ordovician. On the far right-hand side are the currently recognised graptolite zones, with age calibration (Zalasiewicz *et al.*, 2009). The column to the left shows the relative thickness of the stratigraphic units.

The Windermere Supergroup (Figure 3) comprises the latest Ordovician to late Silurian rocks unconformably overlying the Borrowdale Volcanic Group within the main southeastern outcrops.

All localities in this itinerary lie within a homoclinal belt of moderate to steep southeasterly dips, the Westmorland Monocline, related to the Acadian (early Devonian) deformation; all the finer-grained lithologies carry a pervasive, steeply NW-dipping cleavage.

Please do not hammer at any of the localities.

Take Station Road out of Coniston, follow the single track road up the steep hill out of the village for about 1.5 km. Paid parking is available at the (gated) end of the road at SD 2889 9701.

Location 1: Timley Knott SD 2835 9711 (elevation 300 m) Figures 2, 3 & 4.

The lowest part of the Windermere Supergroup (Dent Group) consists of shallow water marine sediments of late Ordovician age, with a shelly fauna, and commonly extensively bioturbated. They overlie the Borrowdale Volcanic Group (BVG) with little discordance in these outcrops. Non-sequences and slight unconformities within the Dent subgroup may indicate either periodic emergence or submarine erosion.

Follow the Walna Scar road for about 700 metres, taking the right branch uphill that goes towards the quarry; leaving the track after about 100 metres, contour to the east to Timley Knott. The southwest side of Timley Knott can be observed at a distance from the track.

All the rocks are conspicuously cleaved.

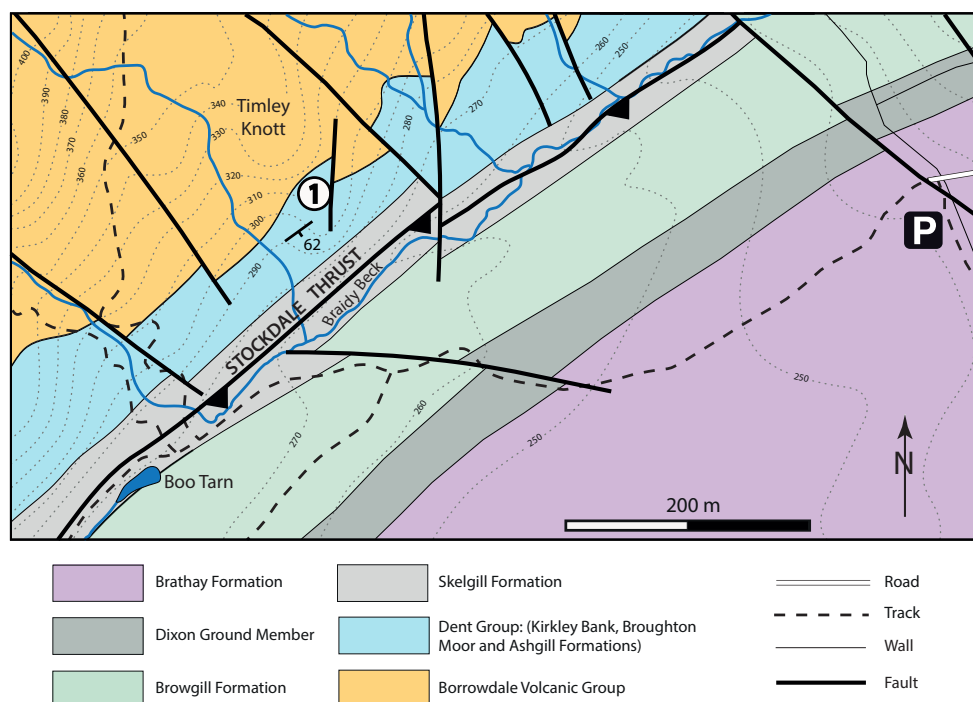


Figure 4. Outline geological map of Locality 1, Timley Knott. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)

Return to the track (about 100 m down the hill), continue for about 800 m where the track curves right [SD 2766 9644] then continue about 200 m south on a small path, on a ridge as far as Torver Beck. Carefully ford the beck and continue SW for 1 km, maintaining a distance of about 50 m NW from the wall, where you can follow a rather poorly-defined path, more or less avoiding the boggy ground.

Location 2: Ashgill Quarry SD 2692 9550 (elevation 300 m) Figure 2, 3, 5

Great care is required when standing below the steep quarried faces, and when walking over the large loose slabs on the floor of the quarry.

This locality is the type section of the Ashgill Formation. The roughly 20 m thick Ashgill Formation consists mostly of well-cleaved blue-grey slightly calcareous silty mudstone, which has been quarried here for roofing slate. The abrupt contact with the overlying graptolitic shales is the Ordovician-Silurian boundary and is clearly seen in the SE side of the quarry. The boundary between the Ashgill and Skelgill represents in part a transition from ice-house to green-house states following the Hirnantian peak of the glaciation.

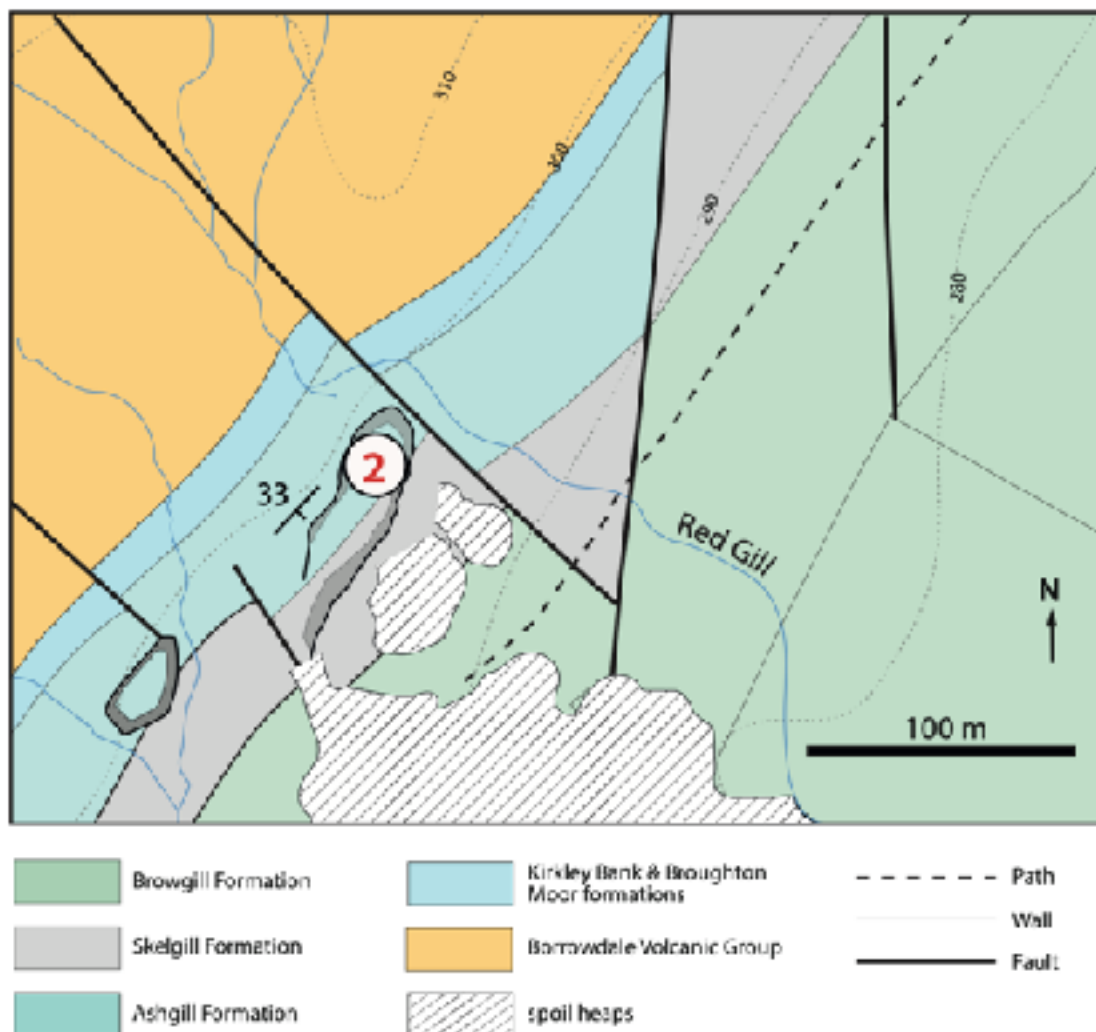


Figure 5. Outline geological map of Locality 2, Ashgill quarry. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)

Return to Torver Beck (Figure 2) and follow the beck towards the SSE for 200 m.

Location 3: Torver Beck SD 2770 9606 (elevation 250 m) Figure 2, 3, 6

The top of the Browgill Formation (Figure 3) is visible in outcrops in the stream, NW of Banishead Quarry. It consists of structureless pale green siltstones, bioturbated but very sparsely fossiliferous, the uppermost few metres of which are grey (Dixon Ground Member). These are succeeded by alternations over 10-30 m between pale grey bioturbated siltstones and the very dark grey hemipelagic siltstones of the Brathay Formation.

Follow the path on the east side of the beck and skirt the steep walls of the quarry (remaining on the outside of the fence) where the Brathay Formation was formerly quarried for flagstones.

Exercise great caution; not only is there a dangerous drop into the quarry, but the water at the bottom is deep and extremely cold. Access to the bottom of the quarry on the east side is steep - *this is not advised*.

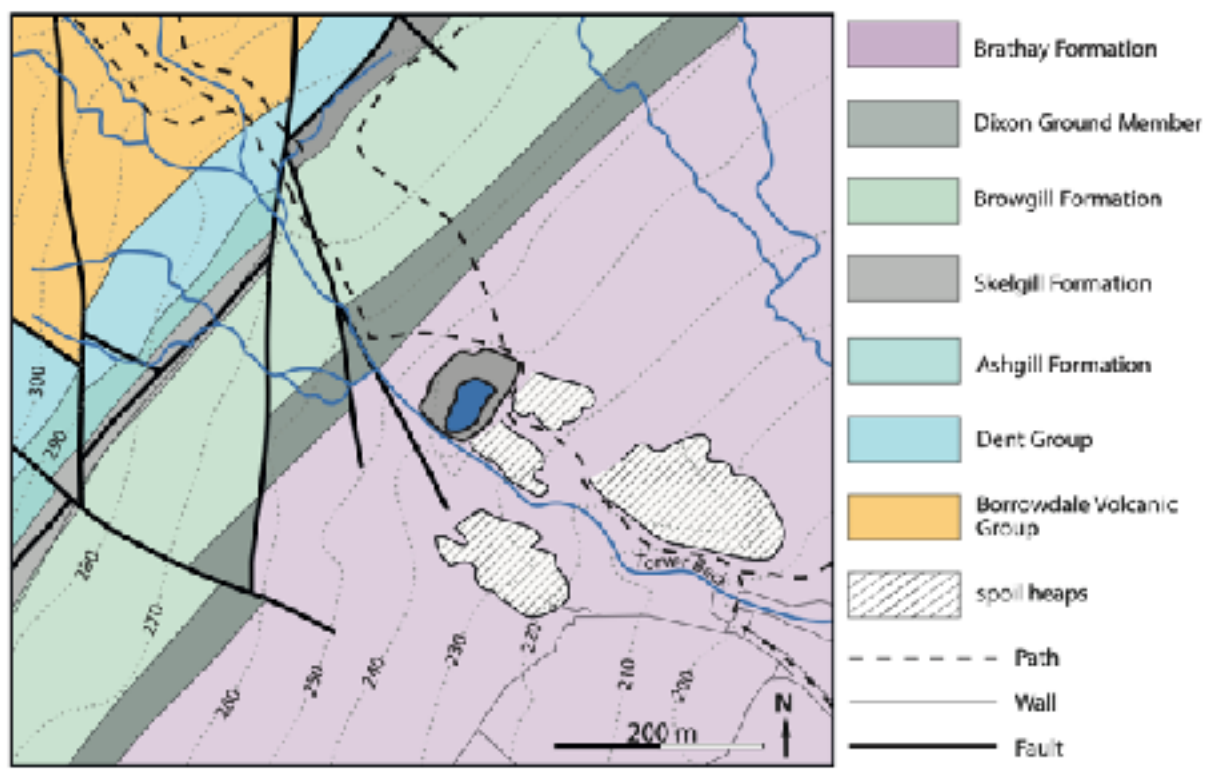


Figure 6. Outline geological map of Locality 3, Banishead quarry. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)

Continue down the main path on the left bank of the stream towards the foot-bridge at SD 2805 9581, but about 30 m before the bridge take the small left fork in the path; after another 100 m cross another small foot-bridge at SD 2815 9584 and continue for about a kilometre northeast, parallel to the wall, along the strike.

Location 4 Birk Riggs Formation SD 2903 9641 (elevation 220 m). Figure 2, 3, 7

Rough outcrops of Birk Riggs Formation, consisting of fine to very fine sandstone turbidites, form low ridges parallel to strike. This unit consists of thin to very thick beds of fine- to medium- or rarely coarse-grained quartz wackes, with a subordinate lithic component. Thinner beds are normally graded and interbedded with laminated siltstone. Thicker beds have reverse-graded bases and normally graded tops but are otherwise massive, often amalgamated to form composite beds up to 5 m thick. Since the formation as a whole tends to show a thickening- and coarsening-upwards trend, the stratigraphically higher outcrops visible over the wall to the south are somewhat better exposed, but unfortunately there is no easy public access.

These sands, which probably form submarine fan lobes, represent the first influx of coarse terrigenous sediment after several million years of perhaps relatively deepwater hemipelagic deposition in anoxic conditions, represented by the Brathay Formation. The progressive incoming of these sands can be observed at the next locality. The sands were supplied axially to the basin, derived from the evolving Scandian orogen to the northeast created by the collision of the continents of Baltica and Laurentia.

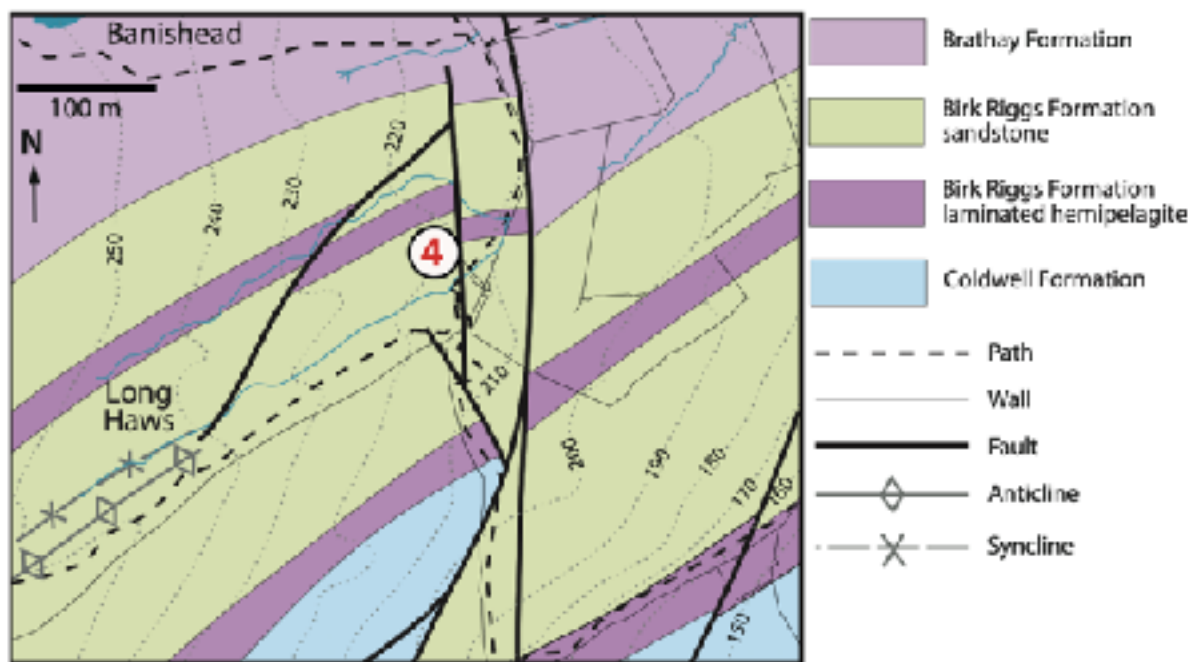


Figure 7. Outline geological map of Locality 4, Long Haws. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)

Continue to the path that follows the wall northwards, and return by this path to the car park. This marks the end of the circular part of the itinerary.

From Coniston, follow the B5285 for 2.5 miles up Hawkshead Hill (Figure 1). It maybe possible to park just inside the quarry entrance to the municipal depot in an old quarry on the left hand side, if the gate is open. If not at the top of the hill, opposite the turning to Tarn Hows, take the small road on the right into the free Forestry Commission car park at High Cross [SD 3321 9861]. Walk 400 m back down the hill along the road with extreme caution, and enter the municipal depot in an old quarry on the right hand side.

Location 5a Base of Birk Riggs Formation SD 3284 9852 (elevation 175 m), Figure 1, 3, 8

This locality shows the upward transition from the dominant laminated hemipelagite facies of the Brathay Formation into the Birk Riggs Formation with upward-increasing proportions of progressively thicker-bedded and coarser-grained graded beds. Regional mapping shows that the Birk Riggs Formation thickens to the NE, and that this vertical succession represents the southwestward progradation of a late Wenlock submarine fan system.

Location 5b. Randy Pike Member of Coldwell Formation SD 3318 9868.

Return to the road junction by the car park and follow the road signposted to Tarn Hows, and after 10 m take the public footpath to the left. After about 80 m the path curves around a ridge consisting of Coldwell Formation. As is typical of this formation, the angle between the steeply northwest-dipping cleavage and southeast dipping bedding is well picked out by the shape of the outcrop. This is the lower (Randy Pike Member) of two roughly 15 m thick intervals of pale blue-grey, calcareous fine- to coarse-grained siltstone, separated by a c.30 m thick interval of laminated hemipelagite. A further 100 m along the path, turbidite sandstones of the Birk Riggs Formation are exposed on the left hand side; the thin intervening unit of laminated hemipelagite is not exposed.

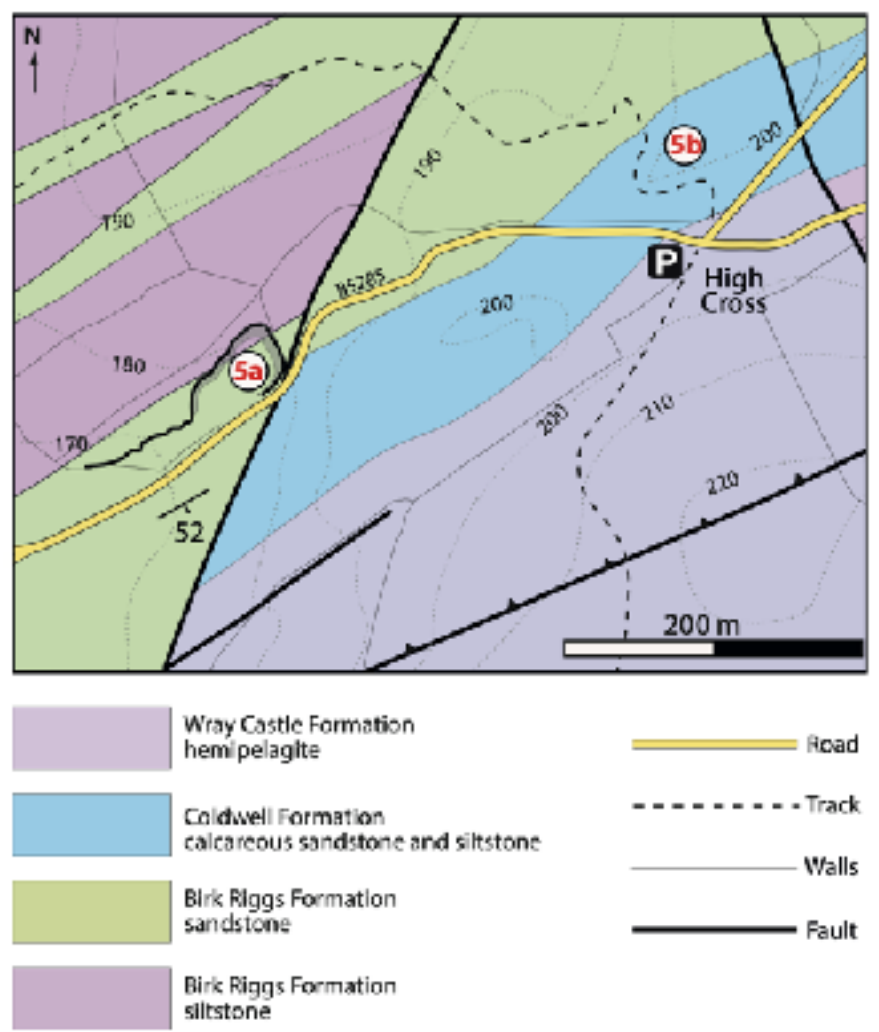


Figure 8. Outline geological map of Locality 5, High Cross. (Based on BGS Sheet 38 Ambleside 1:50 000 contains British Geological Survey materials © UKRI 1996.)