



## South Wales RIGS Group Site Record

### RIGS Description

**SECTION A**

General	South Wales
<b>Site Name: Kemeys Commander</b>	<b>File Number: AH_22</b>
<b>RIGS Number: 798</b>	<b>Surveyed by: AJ Humpage</b>
<b>Grid Reference: SO 34620 02930</b>	<b>Date of Visit: 1 September 2011</b>
<b>RIGS Category: Scientific / Educational</b>	<b>Date Registered:</b> Unknown
<b>Earth Science Category: Geomorphological</b>	
<b>Site Nature: Roadside</b>	<b>Documentation prepared by: AJH</b>
<b>Unitary Authority: Monmouthshire CC</b>	<b>Documentation last revised:</b> 3 October 2011
<b>OS 1:50,000 Sheet: 171</b>	<b>Photographic Record:</b> See images attached to this report
<b>OS 1:25,000 Explorer Sheet: 152</b>	
<b>BGS 1:50,000 : Sheet 232 (Abergavenny)</b>	

**RIGS Statement of Interest:** This site forms part of a network of important scientific sites within the South Wales RIGS area associated with ice front still stand and re-advance in glaciated valleys and post-glacial fluvial development.

At least two ridge crests make up this feature which rises 50 - 60m above the surrounding area. The outermost moraine ridge terminates runs from Little Mill to Rhadyr, a little above Usk, although it is less distinct at its eastern end, and this marks the maximum limit reached by Late Devensian advance down the Usk valley. Sections indicate at least the upper parts of the ridge are dominated by reddish silty sandy till with some evidence of reworked glacio-fluvial deposits

Meltwater drainage from the ice margin at its maximum extent was complex and the outermost moraine ridge is fronted by a flat-floored marginal sandur trough, 500 m wide by 4 km long, underlain by gravel, running east from Little Mill, which collected drainage from exit tunnels in the ice and directed it eastwards to join a similar, but more direct sandur channel draining the eastern side of the ice-margin north of Rhadyr. On the west a similar sandur trough passes south from Little Mill towards Pontypool. As the ice-margin retreated from its maximum the ice-marginal sandur trough was abandoned, complex meltwater channel systems began to cut through the ridge, as illustrated at Rumble Street, before meltwater drainage was concentrated on the eastern side of the valley now occupied by the modern River Usk.

**Geological setting/context:**

This locality has long been recognised as being adjacent the limit of the Last Glacial Maximum (LGM) in this part of the Welsh borderland and has been repeatedly incorporated, together with the neighbouring Wye valley moraine west of Hereford (Luckman 1970, Richards 2005)), into maps of the limits of the Late Devensian glaciation in the UK (Charlesworth 1929; Bowen 1973, 1981; Campbell and Bowen 1989, Thomas, 1997, Lewis & Thomas, 2005). The area was geologically surveyed between 1968 and 1982 (BGS 1990, Barclay 1989) and whilst extensive till deposits were recorded, relatively little additional data was recorded. Except for the work of Crimes et al. (1992) and Thomas (1997) and the excellent geomorphological, but regrettably unpublished, maps of Humpage (1992) and Williams (1968), very little other work has been undertaken in the area.

At the maximum of the Late Devensian glaciation the Usk valley acted as a major drainage outlet for ice flowing from the southeast margin of the Welsh ice-cap. The source area of ice was predominantly the eastern Brecon Beacons, together with some contribution from the Black Mountains and Central Wales. At its maximum the outlet glacier was probably no more than 10 km in length as the ice gradient and the low amplitude of relief of the main valley system would have merged it rapidly into the ice-cap. At its maximum extent it left the narrow confinement of the valley above Abergavenny and spread outwards as a piedmont lobe to terminate just short of Usk. At this time it was probably coeval on its eastern side with a series of small glaciers that drained the valleys of the adjacent Black Mountains and these glaciers may, in turn, have been coeval with the western margin of the Wye glacier termination northwest of Hereford (Luckman 1970, Richards, 2005). Retreat from the maximum was probably rapid and is marked by at least six major stages between Usk and Talybont alone, each representing either a temporary still-stand or a minor snout oscillation, that were responsible for generation of the distinctive suite of inter-related sediment-landform assemblages seen throughout the valley. Although no radiometric dates are available for this part of the Devensian margin it is likely that the Usk glacier probably achieved its maximum c. 20-22 ka and had retreated and disappeared, along with much of the Welsh ice-cap, by c.16 ka.

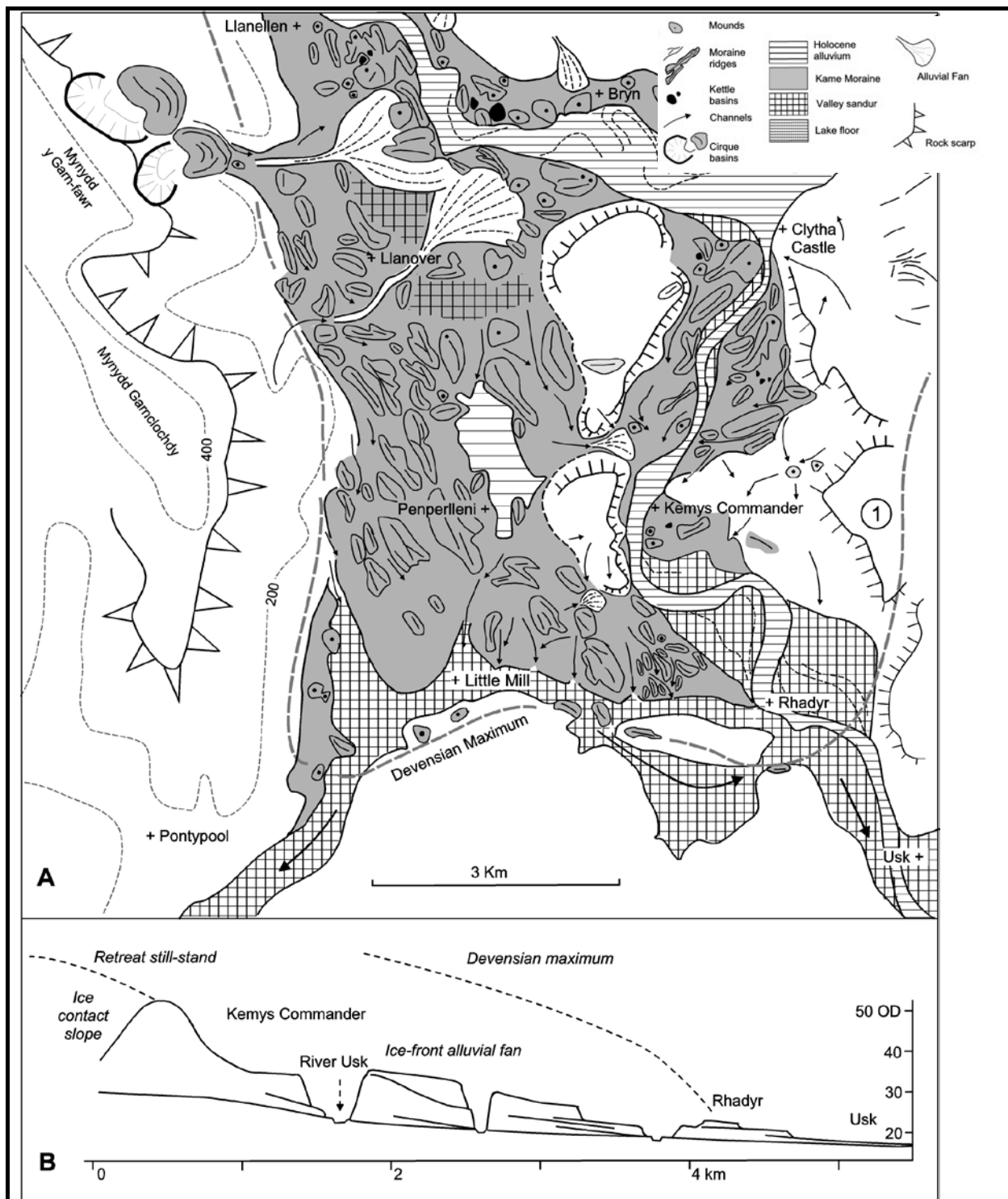


Figure 1. A). Geomorphological map of the area between Usk and Abergavenny. Area to the east of Clytha Castle not mapped in detail and shows moraine crests redrawn from Williams (1968a) only. B). Cross section through Late Glacial Maximum limit showing relationship between sandur fan surfaces and moraine ridges at Kemeys Commander (after Williams 1968a).

When a large valley glacier system passes out into more open ground the ice front often

becomes piedmont and kame-moraine topography is more extensive. Thus, south of Llanellen (Figure 1) the Usk valley widens rapidly along the anticlinal axis of the Silurian Usk inlier and the floor is occupied by a very complex arcuate moraine system composed of numerous, closely-spaced but discontinuous moraine ridges and intervening channel systems in a belt five kilometres wide and six kilometres deep. The continuity of many of the moraines is interrupted by rock ridges that rise along the flanks of the Usk anticline in the centre of the valley and by a steep ridge to the east but the arcuate form is clearly seen on both flanks between Llanover and Clytha Castle. To the southeast of Llanellen, is a complex area of ice-disintegration topography including a number of large kettle basins. Further south, two large alluvial fans, draining from cirque basins high on the Carboniferous escarpment to the west, partially bury out the morainic topography. East of Penperlleni is an extensive strip of flat ground, underlain by laminated silts and bounded by arcuate moraine ridges, that probably represents the former site of a temporary ice-marginal lake basin trapped between the retreating ice-margin on the inside and older moraines on the outside.

The outermost moraine ridge terminates at Rhadyr, a little above Usk, and marks the maximum limit reached by Late Devensian advance down the valley (Stage 1, Figure 1). Meltwater drainage from the ice margin at its maximum was complex and the outermost moraine is fronted by a flat-floored marginal sandur trough, 500 m wide by 4 km long, underlain by gravel, running east from Little Mill. This marks the position of a major ice-marginal sandur channel that collected drainage from exit tunnels in the ice and directed it eastwards to join a similar, but more direct sandur channel draining the eastern side of the ice-margin north of Rhadyr. On the west a similar sandur trough passes south from Little Mill towards Pontypool. As the ice-margin retreated from its maximum the ice-marginal sandur trough was abandoned and meltwater drainage was concentrated on the eastern side of the valley. South of Kemeys Commander the modern flood plain is flanked by a flight of sandur fan terraces each graded to a tunnel exit in a large retreat moraine and subsequently incised and abandoned on further retreat (Williams 1968).

## References:

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- Williams, G.J. (1968). *Contributions to the Pleistocene geomorphology of the middle and lower Usk*, unpublished PhD thesis, University of Wales.

## SECTION B

### PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

#### Accessibility:



Comment: Private property and public roads – some features accessible by public rights of way.

#### Safety:



Comment: Beware of fast moving traffic on main road and along narrow lanes

#### Conservation status:

River Usk channel and river banks are designated as SSSI, otherwise there are no known designations of this location. **N.B Rhian check Silurian road cutting site**

### OWNERSHIP/PLANNING CONTROL:

**Owner/tenant:** Unknown - Various

**Planning Authority:** Monmouthshire County Council

**Planning status/constraints/opportunities:** There are no known planning constraints or opportunities.

### CONDITION, USE & MANAGEMENT:

**Present use:** Pastureland grazing, arable crops and domestic properties

**Site condition:** Generally good,

**Potential threats:** Ongoing development and changes in agricultural practices.

**Site Management:**

### SITE DEVELOPMENT:

**Potential use (general):**

**Potential use (educational):** Important site showing the first major ice front stillstand or minor readvance upstream of the Late Glacial Maximum.

### Other comments:

It may be a consideration to extend this RIGS into Llancayo village to take account of the extensive sandur outwash surface (glacio-fluvial sheet deposits) at this location.

## Photographic Record



View looking south-west downstream towards the Usk glacier end moraine (bank to right of photograph). The tree-covered high ground on the skyline is the Silurian age Usk inlier.



View south showing the flat, gently sloping sandur surface downstream of the moraine (brown coloured field). The field of maize is planted on the downstream slope of the Kemeys Commander moraine.



Small, water-filled kettle basin upstream of the moraine ridge



View looking south up the upstream slope of the moraine – the white house is located on the ridge crest – note the undulating surface, possibly associated with ice decay features.





A similar view to the above image, clearly illustrating a depression in the upstream slope of the morainic ridge



Looking downslope towards the north-east towards base of upstream face of the moraine ridge



View looking east across upstream face of moraine ridge, providing a sense of the slope angle and behind the tree, another possible small dry kettle basin is visible



Kemeys Commander church is located on the ridge crest



Downstream, the village of Llancayo and its windmill (now restored) are located on the gently undulating, near flat, glaciofluvial outwash terrace associated with the Kemeys Commander moraine