

# LOUTH - COUNTY GEOLOGICAL SITE REPORT

<b>NAME OF SITE</b>	<b>King John's Castle</b>		
Other names used for site			
<b>IGH THEME</b>	<b>IGH11 Igneous Intrusions</b>		
	<b>IGH 4 Cambrian–Silurian</b>		
<b>TOWNLAND(S)</b>	<b>Liberties of Carlingford</b>		
<b>NEAREST TOWN/VILLAGE</b>	<b>Carlingford</b>		
<b>SIX INCH MAP NUMBER</b>	<b>5</b>		
<b>ITM CO-ORDINATES</b>	<b>718736E 812005N</b>		
<b>1:50,000 O.S. SHEET NUMBER</b>	<b>36</b>	<b>GSi BEDROCK 1:100,000 SHEET NO.</b>	<b>8/9</b>

## Outline Site Description

The site includes several exposures of the large outcrop at the northern end of Carlingford town on which King John's Castle is built: a rock cutting in a lay-by, a cliff exposure on the foreshore and the base of the castle itself.

## Geological System/Age and Primary Rock Type

The outcrop consists mainly of Silurian (440-445 Ma) siltstones and coarser greywackes of the Longford-Down Inlier. Several dolerite cone sheets, part of the Palaeogene Carlingford Igneous Complex (60 Ma), were subsequently intruded into the sediments.

## Main Geological or Geomorphological Interest

As well as being among the most accessible, the exposures of cone sheets at King John's Castle are among the best seen in the Carlingford Igneous Complex, illustrating not only aspects of their mineralogical composition but also their emplacement history and disposition. The complex deformation history of the Longford-Down Inlier, interpreted as an accretionary prism formed above a subduction zone, can be glimpsed in the strong deformation, including cleavage and spectacular folding, displayed by the metasediments.

Cone sheets form when radial fractures develop outwards in cooling igneous intrusions. These fractures dip inward toward the centre of the intrusion and can be intruded by later-stage magma. When this happens, the resulting relatively thin intrusion has the shape of an inverted cone. The cone sheets exposed at this site all dip 30–50° west, toward the centre of the Carlingford Complex. All are composed of fine-grained dolerite, in places with large crystals (*phenocrysts*) of white plagioclase feldspar typically clustered in the centre of the cone sheets, an example of flow sorting within an igneous intrusion, where the faster-flowing magma in the centre of the intrusion has entrained the phenocrysts.

The metasediments have a near-vertical dip and display tight, upright folding, the latter best seen in the lay-by. Thin siltstone beds alternate with thicker, more massive greywackes that are less strongly cleaved than the siltstones as a consequence of their greater hardness and strength.

## Site Importance – County Geological Site

Cone sheets are a characteristic feature of the Carlingford Igneous Complex and they are especially well displayed at King John's Castle site. The site is within the Carlingford Lough SAC and proposed NHA.

## Management/promotion issues

The site is already a popular stop for guided geological field trips. An information panel should be considered for the lay-by, which is a popular picnic stop. However, the rock cutting at the lay-by needs regular maintenance to keep the face clear of vegetation.



Rock face at lay-by, King John's Castle (left); dolerite cone sheet (below yellow line) cutting vertically-dipping sediments (same outcrop) (right).



Coarse plagioclase crystals in centre of dolerite cone sheet at lay-by (above); tightly folded metasediment layers above cone sheet at lay-by (right).



Dolerite cone sheet (1m thick) cutting vertically-dipping metasediments in cliff-face above beach (left); dolerite cone sheet (> 1m thick) in base of King John's Castle (right).





