GALWAY - COUNTY GEOLOGICAL SITE REPORT

NAME OF SITE	**Mace Head**
Other names used for site	
IGH THEME	**IGH6 Mineralogy, IGH11 Igneous intrusions, IGH15 Economic Geology**
TOWNLAND(S)	**An Más (Mace)**
NEAREST TOWN/VILLAGE	**Carna**
SIX INCH MAP NUMBER	**76**
ITM CO-ORDINATES	**473910E 731480N**
1:50,000 O.S. SHEET No. 44	**GSI BEDROCK 1:100,000 SHEET NO. 10**

Outline Site Description
The Mace Head site comprises extensive foreshore bedrock outcrops.

Geological System/Age and Primary Rock Type
Late Caledonian (*c*. 400 Ma) calc-alkaline Galway granite hosting molybdenum- copper (Mo-Cu) mineralization in quartz veins.

Main Geological or Geomorphological Interest
The mineralization at Mace Head is the largest known example of porphyry Mo-Cu mineralization in Ireland. It has many of the classic features of such mineralization, including a chemically evolved I-type granite host, associated Si- and K-rich alteration, quartz vein-hosted molybdenite, pyrite, chalcopyrite and magnetite mineralization and gangue minerals that include quartz, muscovite and K-feldspar.

The mineralization is at the western end of the Galway Granite batholith, hosted by the Carna Granite, which displays orbicular textures at Mace Head. It is well exposed on the shore at Mace Head, west of the pier. The area inland, particularly around Lough Bunnacliffa over 1 km to the north, has been the locus of mineral exploration since the late 1960s and recent exploration has increased the extent of known mineralization. The foreshore outcrops demonstrate the main features of the mineralization and so comprise the area of this site.

Mineralized veins on the foreshore trend mostly northeast-southwest and are near vertical or dip steeply northwest. They are hosted by strongly altered granite. The main sulphides present in veins are molybdenite and pyrite, the former typically intergrown with muscovite, particularly along the margins of veins. Magnetite occurs mainly in quartz-magnetite ponds, which pre-date the main vein mineralization. Chalcopyrite is more typical of the inland veins and is relatively rare on the foreshore. Late, shallow-dipping quartz veins are typically unmineralized.
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Site Importance – County Geological Site; recommended for Geological NHA
The site is within the Kilkieran Bay and Islands SAC (site code 002111), and the site contains a portion of the largest known example of porphyry Mo-Cu mineralization in Ireland. Clean, accessible foreshore outcrops provide excellent examples of both the mineral-bearing veins and the characteristic alteration of host-rock granite. The quality of the exposure and the fact that the Mace Head deposit is the largest of its kind in the country make this site a candidate for NHA status.

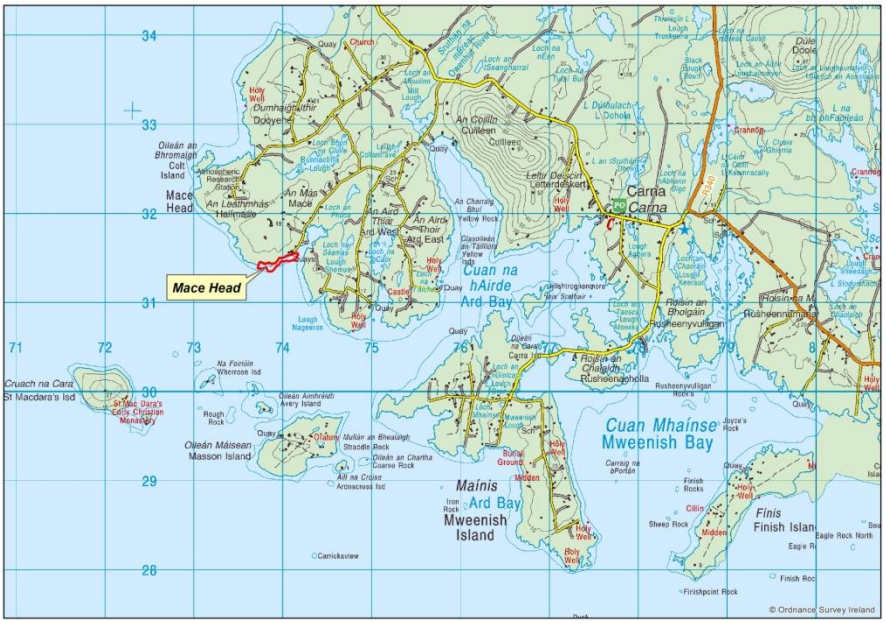
Management/promotion issues
The site is readily accessible on foot from the public pier at Mace Head, and as it is on the foreshore there is no development risk to the site. The site is likely to be mainly of interest to geologists and students and probably does not require promotion. However, consideration could be given to erecting a signboard at the pier that provides information about the SAC in addition to the geological interest of the site.

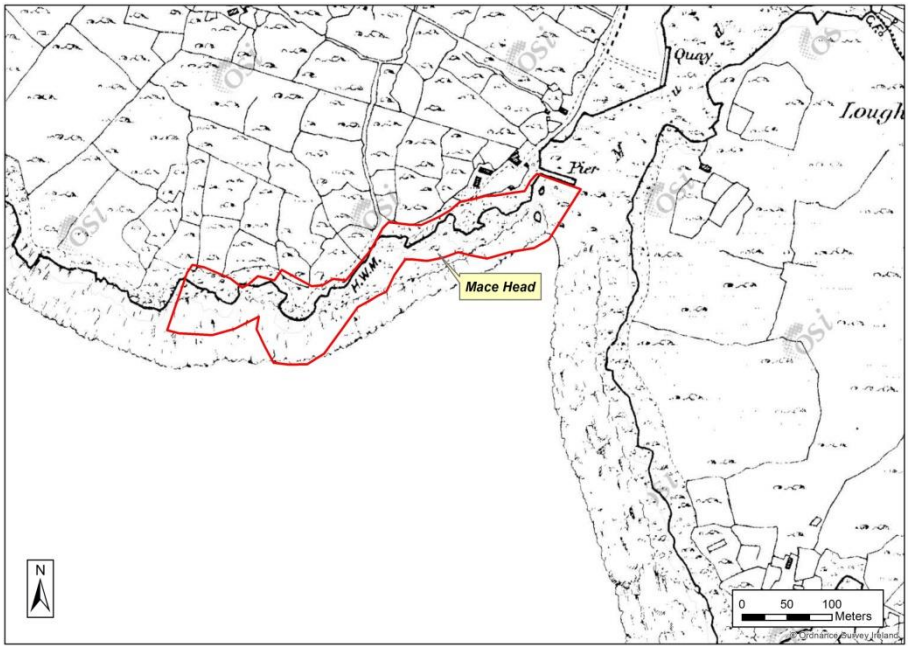
View westwards of foreshore outcrops at Mace Head.

Alteration (red) of granite around fractures and small quartz veins.

View southwards along major quartz vein.

Molybdenite along margins of vertical quartz vein (light grey), intergrown with muscovite, is visible along most of length of vein, with largest concentration at point of hammer head (top).





Meehan et al. 2019. Geological Survey Ireland.