

WICKLOW - COUNTY GEOLOGICAL SITE REPORT

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| NAME OF SITE | Avoca District - Overview |
| Other names used for site | |
| IGH THEME | IGH15 Economic Geology |
| TOWNLAND(S) | Connary, Cronebane, Ballygahan, Ballymurtagh, Sroughmore, Tigroney West |
| NEAREST TOWN/VILLAGE | Avoca |
| SIX INCH MAP NUMBER | 35 |
| NATIONAL GRID REFERENCE | 720200E 682700N |
| 1:50,000 O.S. SHEET NUMBER | 62 GSI Bedrock 1:100,000 Sheet No. 16, 19 |

Introduction

Copper mining began in Avoca around 1720 and continued episodically for the next 260 years. The selective hand-tool mining of high-grade seams of the 18th and 19th Centuries gave way to mechanized mining of relatively low-grade ore (0.6% Cu) in the second half of the 20th century. Historically the mine was subdivided into a series of small properties, or setts, and these form the basis for the individual sites defined in this audit, although, in modern times, the site has generally been seen as comprising East and West Avoca.

Between 1822 and 1888, up to 200,000 tons of copper ore and 2,400,000 million tons of pyrite were mined in Avoca, while from 1958 to 1982 almost 12 Mt of ore were mined, most of it underground in West Avoca. The mine underlies the ground that rises to the east and west of the Avoca River and, throughout the mine's history, acidic, metal-rich mine water has drained directly to the river, causing severe contamination and disruption of the aquatic ecosystem. The site today is surrounded by farmland, mainly used as pasture for cattle and sheep. There is a relatively high density of houses, chiefly detached single houses, in the area, and some are in very close proximity to the mine site.

Geology and Mineralization

The Avoca deposit is hosted by the Avoca Formation, a northeast-southwest-trending sequence of 455 million-year-old Ordovician volcanic and sedimentary rocks. The formation is 2-4 km thick and dips steeply to the southeast. A series of north-south faults offset the mineralized zones and they have been interpreted as possible feeder zones for mineralizing fluids. The mineralization is found mainly within distinctive chloritic tuffs, interpreted as having formed by alteration of rhyolitic and intermediate tuffs on the seafloor during the hydrothermal activity that gave rise to the mineralization. Shearing is a distinctive element of the mineralization and may have played an important role in the formation of vein-disseminated mineralization.

Mineralization types include (1) banded or massive ore where bands of pyritic ore alternate with bands of sphalerite-rich ore and bands of chlorite and sericite; (2) disseminated ore or stringer ore containing major pyrite, chalcopyrite, sphalerite and lesser galena within a siliceous matrix; (3) Lead-Zinc ore containing banded sphalerite, galena, pyrite, arsenopyrite and chalcopyrite in a chlorite matrix and (4) supergene mineralization formed by weathering of bedrock ore within 60 m of the surface.

Main Geological or Geomorphological Interest

Avoca has a long history amongst mine sites in Ireland. Numerous 18th- and 19th-century mine features remain on the site, including engine houses, adits, and shafts, including some that appear to be unique in Ireland, such as the tramway arch, flatrod tunnels and ochre pits. These pre-20th century features are more numerous and varied at Avoca than at any other mine in Ireland. The large-scale mechanized mining of the 20th century, especially excavation of open pits, has altered the site significantly, creating potential hazards for visitors, but has also helped create an interesting and varied landscape. Avoca is the best example of

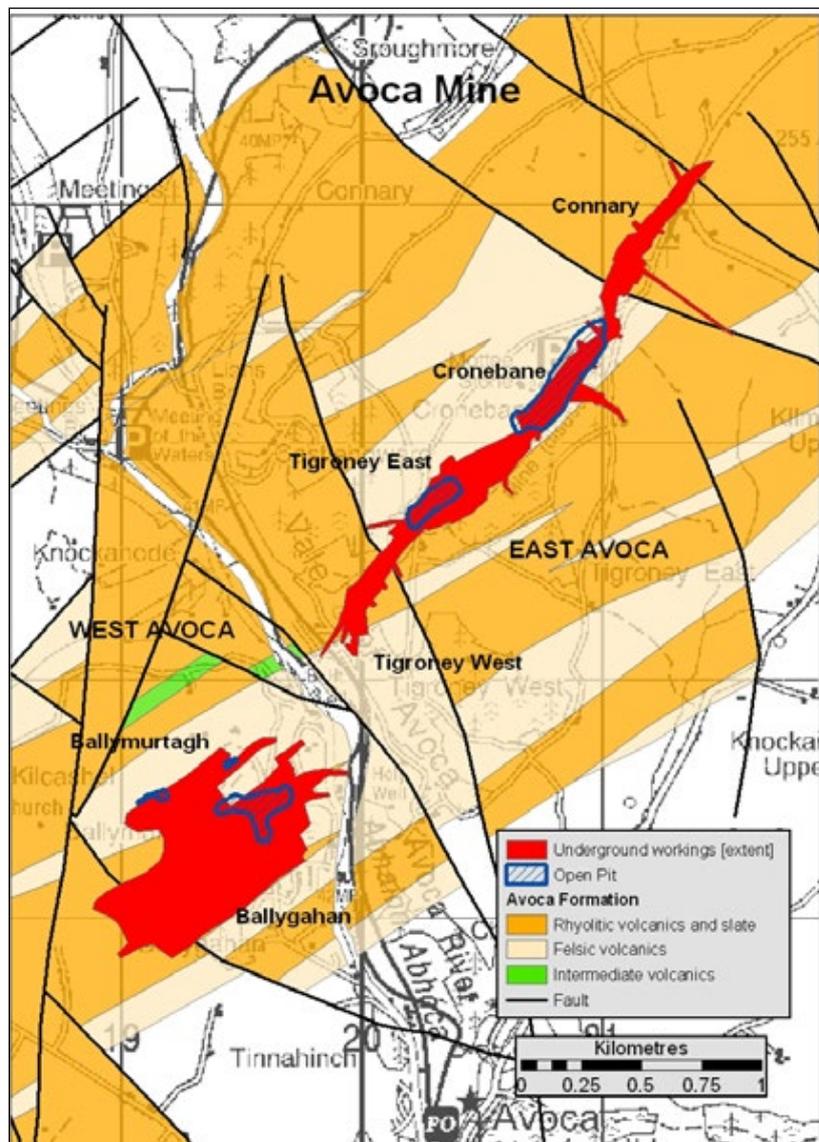
volcanic massive sulphide (VMS) copper deposits in Ireland and the remaining examples of mineralisation on the site are of significant scientific interest. Avoca is also the only mine site in Ireland with significant acid mine drainage (AMD). This AMD is generated by the reaction between rainfall and the pyritic ore within the workings and the spoil areas, and contributes to the Avoca River. It thus affords a unique opportunity for studying the negative environmental impacts of AMD and the success or otherwise of approaches to mitigating its effects.

Site Importance – County Geological Site; may be recommended for Geological NHA

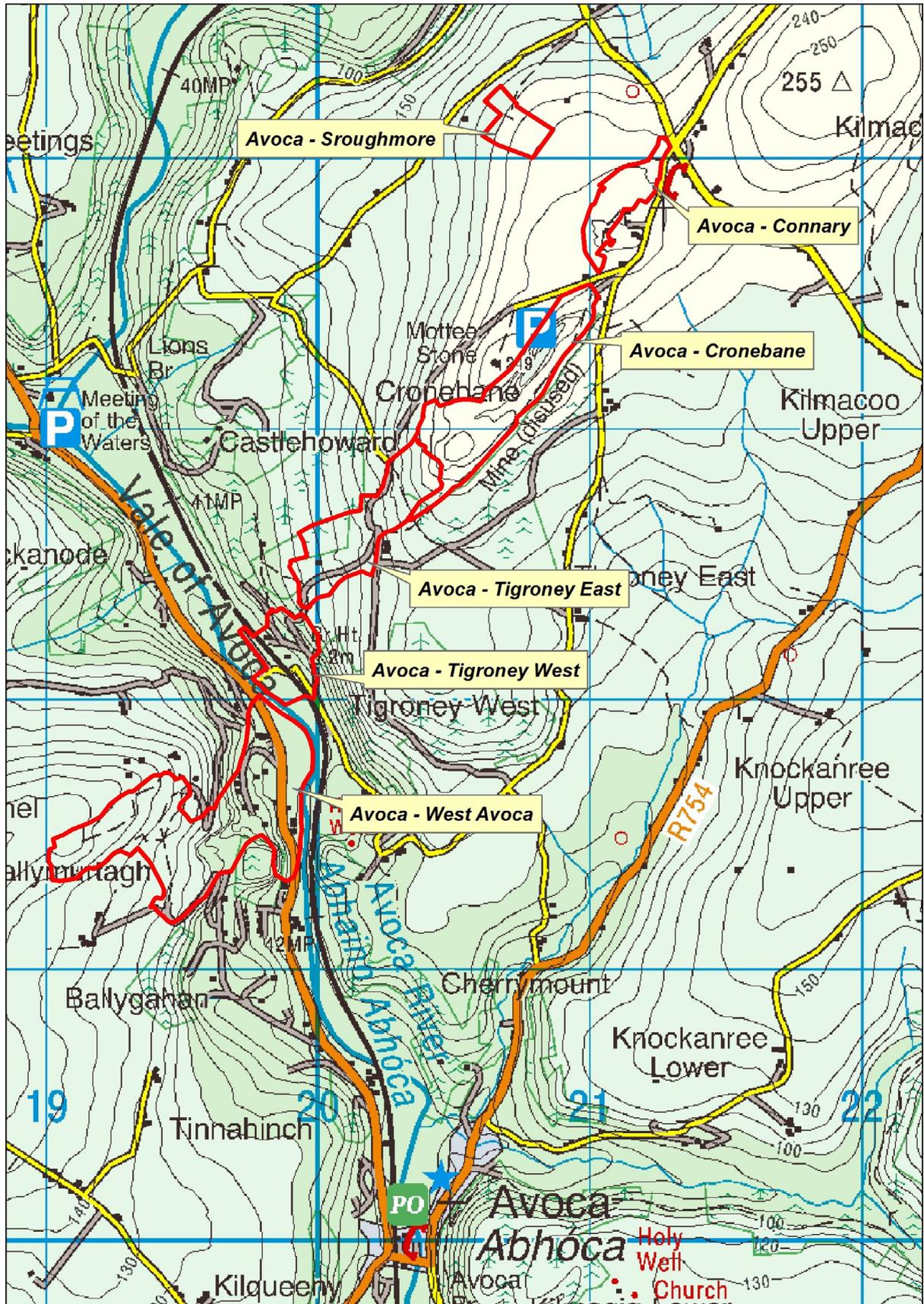
Avoca is the largest and best example of a VMS deposit in Ireland. Its mine heritage is extensive and varied, with some unique elements in an Irish context.

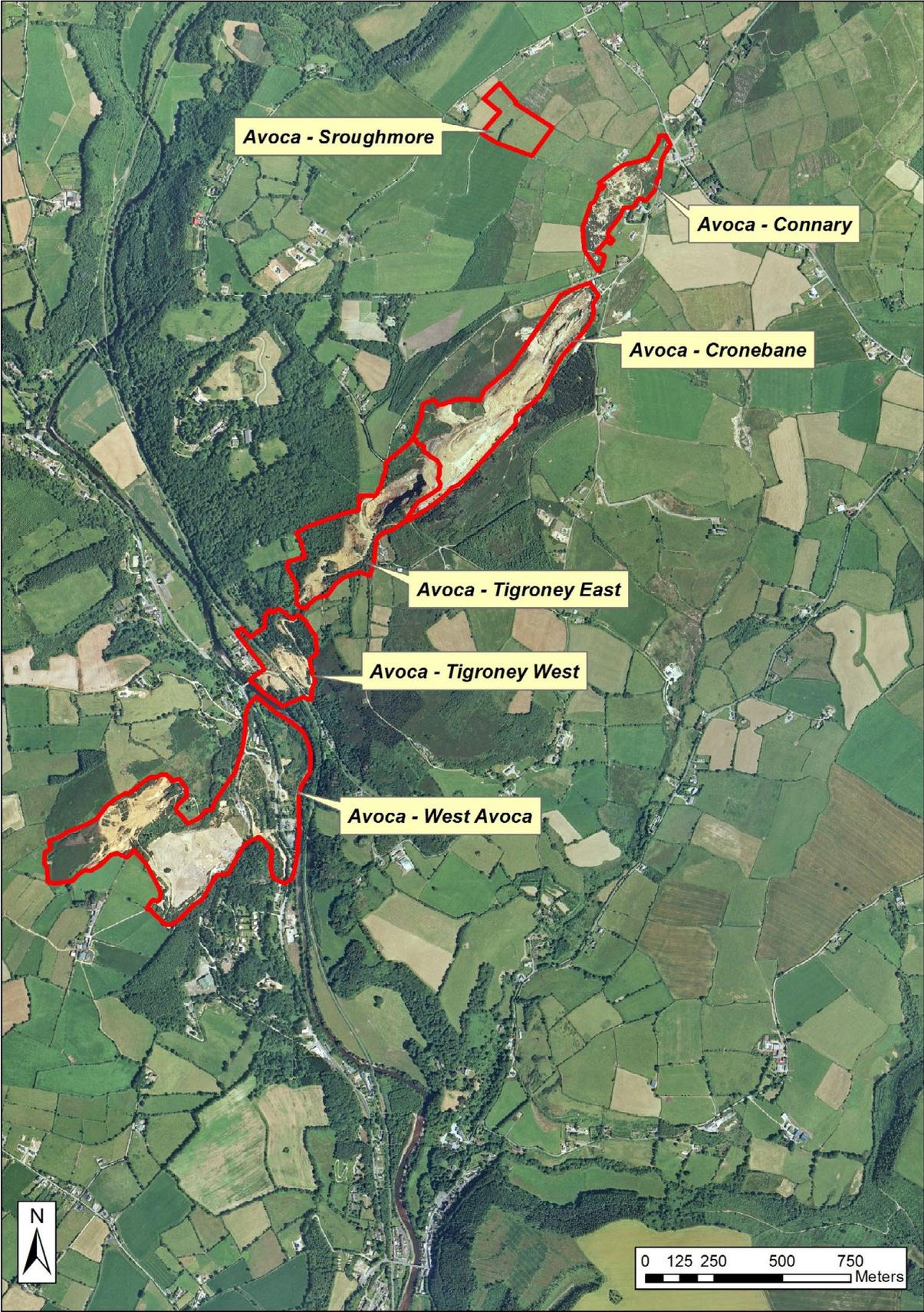
Management/promotion issues

Much of the site is accessible on foot from public roads. Works are ongoing to make safe various parts of the site, including open shafts and adits, and to reduce environmental impacts from AMD. Thus, in the short term, promotion of the site is not warranted. In the longer term, Avoca provides a unique opportunity to develop a mine heritage site that encompasses many aspects of mining, including its environmental impacts and measures developed to ameliorate them. However, the site in its present state is unsafe and access by the public should not be encouraged.



Map from Stanley *et al.* 2010





Avoca - Sroughmore

Avoca - Connary

Avoca - Cronebane

Avoca - Tigroney East

Avoca - Tigroney West

Avoca - West Avoca



0 125 250 500 750 Meters