

CAMINCHES STAMPS

Background information

Mine District: Allihies

Mine Name: Caminches Stamps

Alternative Names:

Elements of interest:

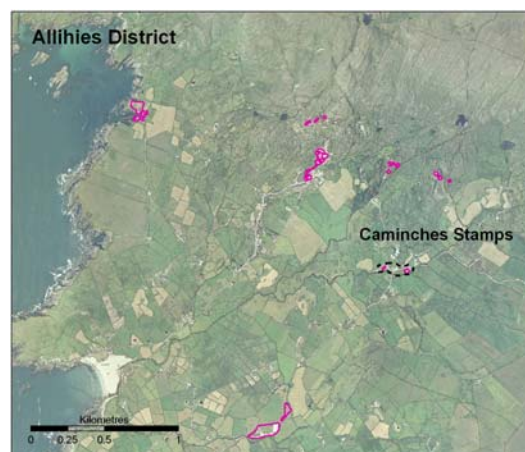
Cu

Project Prefix: ALL-

County:
Cork

Townland:
Caminches

Grid Reference:
E59485, N44880



Site Description and Environmental Setting

This site hosted stamp batteries for Caminches mine. No detailed information is available for the site. The locations of the stamp batteries are marked on the 1837 six-inch maps (Fig. 1) but not on subsequent ones. The site is on the banks of Ballydonegan River, several hundred metres south of the mine site, and was presumably chosen in order to exploit water power to run the stamps. As defined for this project, the site occupies 1.4 ha. Most of the surrounding land is used for cattle pasture. A small number of farmhouses in the area has been augmented by a growing number of newly built houses, including holiday homes.

Two waste heaps are the main evidence for former mine-related activities on the site. Both have Fe-oxide-rich horizons that are typical of stamps waste. The waste heap on the east side of the public road, SP08, is on unfenced scrub land (right); SP09 to the west is mostly contained within a fenced pasture field. An iron support, driven into the bedrock, is the only evidence for the central stamp battery (Fig. 1).



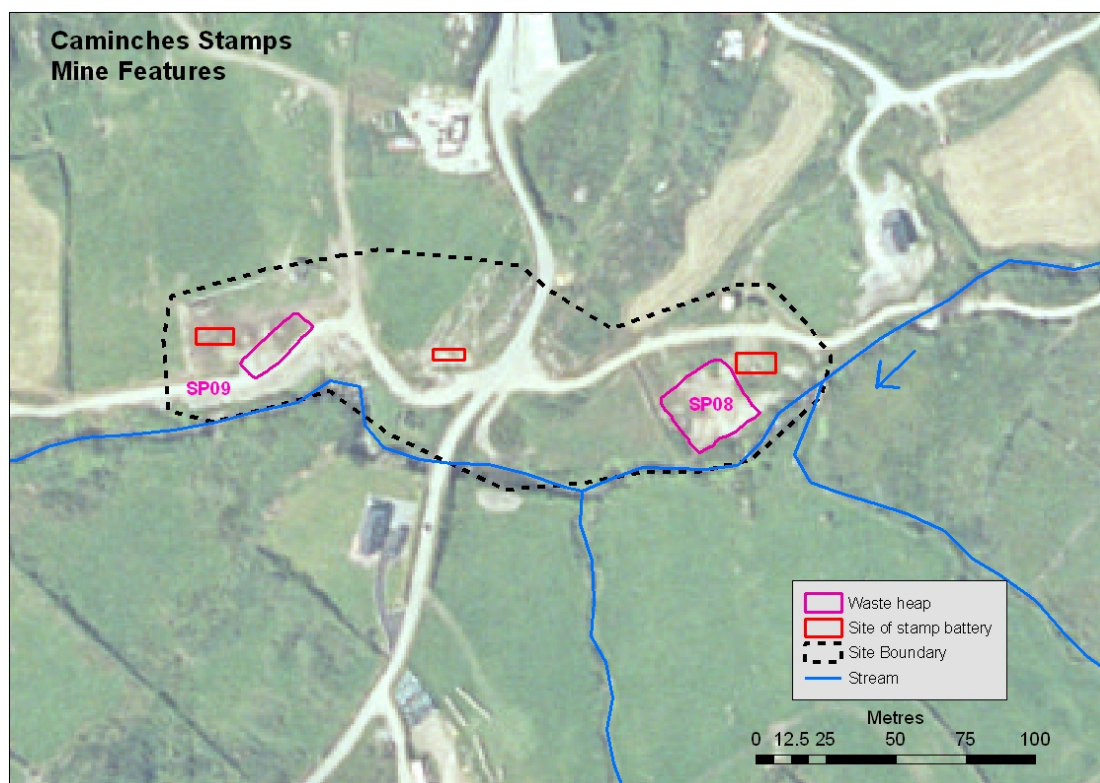


Fig. 1 Caminches Stamps: mine features

Table 1 Area and Volume of spoil heaps, Caminches Stamps

Waste ID	Area (m ²)	Volume (m ³)
ALL-07-SP08a	662	900
ALL-07-SP09	246	246

Geochemical Assessment

1. Surface Water

Stream water samples were taken at two sites in the Ballydonegan River in both winter and summer, one upstream and one downstream of the waste heaps. Concentrations of metals in the water samples were generally very low. The maximum measured total Cu concentration was 52 µg/l in the downstream site in winter; the upstream site sample had 34 µg/l Cu. Corresponding summer analyses were 18 and 16 µg/l, respectively. The data collected shows no evidence that the stamps waste has any impact on the quality of the stream water at this site.

2. Groundwater

No groundwater was sampled at this site. A sample of solid waste from the eastern heap, SP08, was subjected to a leachate test. Cu concentration in the leachate was 2194 µg/l. Other elements of interest were not present in significant amounts.

3. Stream Sediments

Stream sediment samples were collected upstream and downstream of the waste heaps, close to the surface water sample sites. With the exception of Cu, elements analysed do not show significant increases in concentration in the downstream sample relative to the upstream sample. Measured Cu in the upstream sample was 26 mg/kg; in the downstream sample it was 530 mg/kg. This suggests that the stamps site has had an impact on the stream sediment composition, although the downstream Cu concentration is among the lower values measured in the Allihies district.

4. Solid Waste

Seven locations were selected for *in situ* XRF analysis (Fig. 2). Five analyses were carried out on a vertical profile at one location in the exposed section of the southwest corner of SP08, giving a total of 11 analyses for the stamps site as a whole. Table 2 provides a statistical summary of the data.

The solid waste at the eastern part of the Caminches Stamps site (SP08) is typically fine-grained, sandy material of brown to red-brown colour. Material in the exposed, 2m-high bank where SP08 borders the Ballydonegan river has blue-green horizons (right) apparently rich in Cu oxide. Analysis of these horizons in vertical profile reveals the highest Cu concentrations in solid waste found in the Allihies district. Measured Cu in the five vertical profile analyses ranges from 2289 to 75580 mg/kg, i.e. up to 7.5% Cu. Two of the other vertical profile analyses yielded values of 2.0 and 5.1 % Cu.



The waste heap on the western part of the site (SP09) is similar in texture and colour to that on the east but also contains an abundance of coarse clasts or cobbles on its surface (left). The waste heap is draped over an outcrop of siltstone and is relatively thin. It is within a pasture field and is commonly traversed by cattle. Of two analyses carried out, one measured over 2% Cu.

The median Cu concentration in solid waste analysed at the Caminches Stamps site is 6857 mg/kg, almost three times the median for Allihies district (Table 2). As is the case for other sites in the district, solid waste at Caminches Stamps site is not enriched in other metallic elements such as Sb, As, Pb, and Zn.

Table 2 Summary statistics, Solid Waste XRF analyses, Caminches Stamps

mg/kg	Cu	Sb	As	Pb	Zn
n	11	11	11	11	11
Minimum	741	0.0	0.0	0.0	0.0
Maximum	75520	208	20	30	0.0
Mean	17874	78	11	9	0.0
Median	6857	81	12	0.0	0.0
Median, all Allihies (n = 103)	2588	74	19	33	0.0

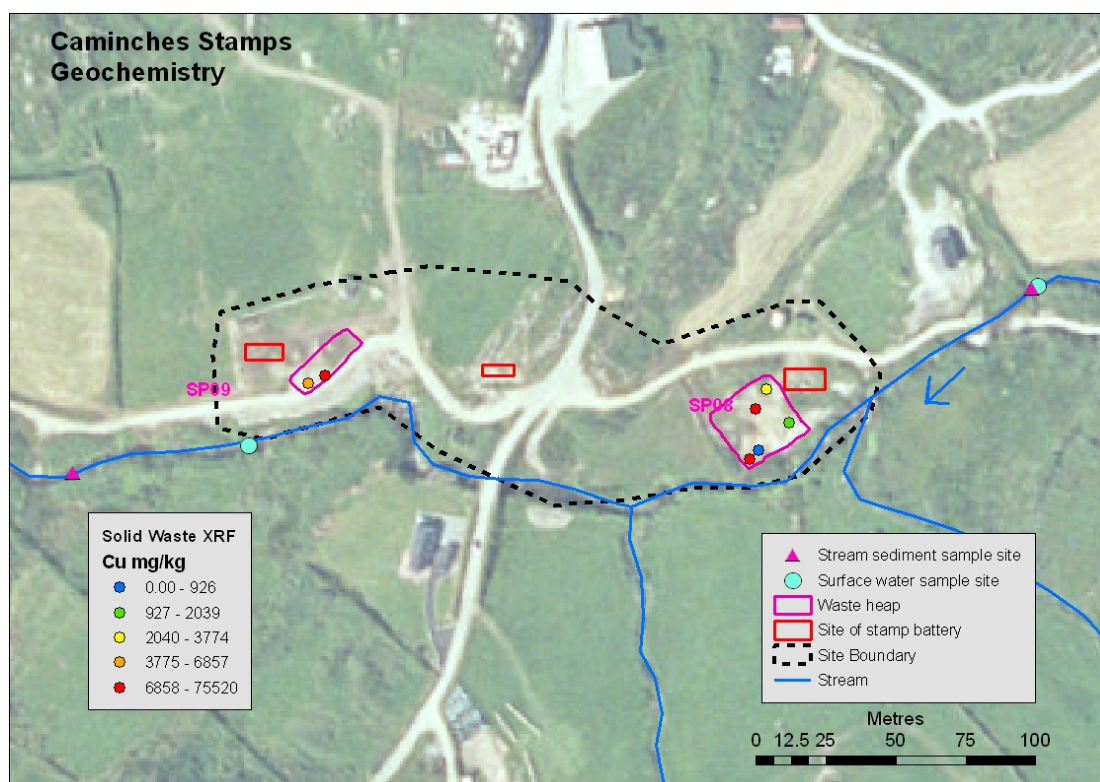


Fig. 2 Caminches Stamps, Solid Waste Geochemistry: Cu

5. HMS-IRC Site Score

The total HMS-IRC Site Score for Caminches Stamps site is 10, with similar contributions from the two solid waste heaps defined on the site (Table 3). The Cu concentration of stamps waste is generally higher than that of other solid waste in the Allihies District and the scores for each of the heaps on the Caminches Stamps site are higher than those for other waste heaps of comparable size in the district.

As is the case for the Allihies District as a whole, the surface water pathway (70%) is significant contributor to the site score than the groundwater pathway (30%) (Fig. 3). The low volume of waste, the lack of important aquifers in the area and the low population density, and hence small number of possible wells, minimize the groundwater pathway contribution while the location of the waste directly beside the Ballydonegan River maximizes the surface water pathway contribution. The negligible contribution of the Direct Contact and Air pathways follows from the low volume and area of the solid waste as well as the absence of significant

concentrations of any elements of high relative toxicity. Stream sediments are scored as part of the district as a whole (see Allihies District report).

Table 3 HMS-IRC Site Scores, Caminches Stamps

Waste	SP08	SP09	Total
1. Hazard Score	11	12	23
2. Pathway Score			
<i>Groundwater</i>	1.58	1.41	2.99
<i>Surface Water</i>	3.78	3.20	6.98
<i>Air</i>	0.00	0.00	0.0
<i>Direct Contact</i>	0.00	0.00	0.0
<i>Direct Contact (livestock)</i>			
3. Site Score	5	5	10

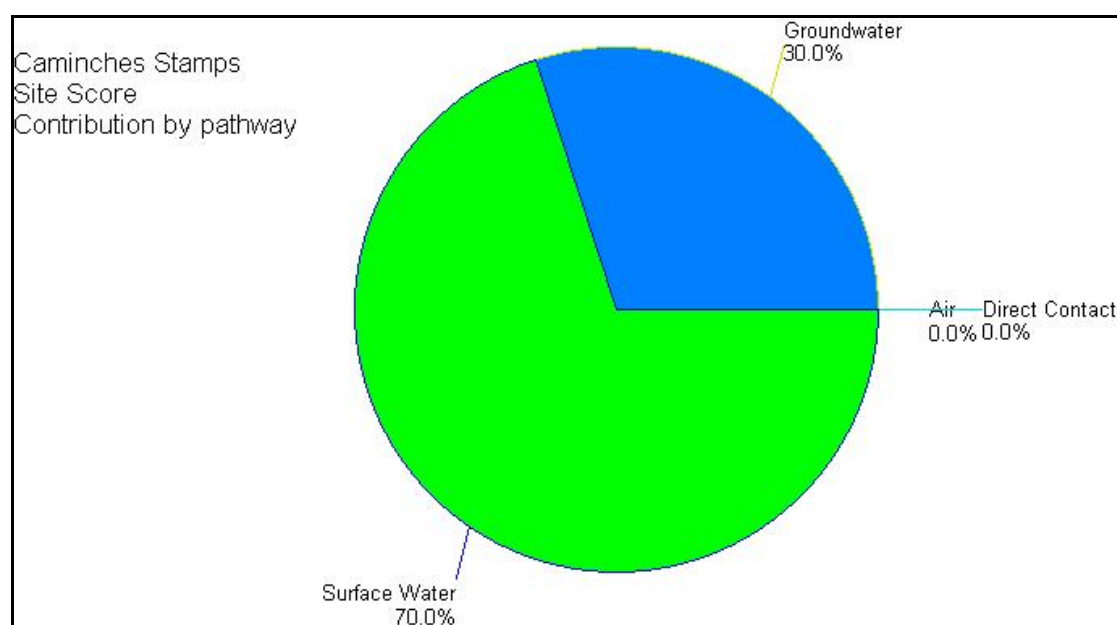


Fig. 3 Caminches Stamps HMS-IRC Site Score: contribution by pathway

6. Geochemical overview and conclusions

The Caminches Stamps site contains two solid waste heaps with some of the highest Cu concentrations known in the Allihies District, ranging from 2289 to 75580 mg/kg, i.e. up to 7.5% Cu. Only Cu is significantly enriched in the heaps. Stream sediments downstream of the site have elevated Cu concentrations, apparently as a consequence of the stamps operations. However, surface water in the Ballydonegan River appears to be unaffected by the waste lying along the river bank. Despite the high measured Cu concentrations in some of the stamps waste, the low volume of the waste and the absence of high concentrations of elements of high relative toxicity give rise to a relatively low site score. Direct drainage of Cu-rich leachate to local streams appears to represent the most significant potential environmental risk on the site.