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GEOLOGICAL REPORT

PENGUIN CREEK DEPOSITS

& IRON CLIFFS LODE

by
W C Smith

2nd March 1960

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Introduction

On 4th November 1959, Special Prospector's Licence No. 363 was granted to W.C. Smith as agent for The Broken Hill Proprietary Co. Ltd. to carry out a geological survey of 24 square miles near Penguin, Tasmania, and to test favourable discoveries by drilling. The primary object of the survey was to find manganese ore suitable for the ferro-alloy plant to be established at Bell Bay, and the area granted included the only reported manganese deposits in Tasmania.

The known manganese deposits of the area proved to be of little interest, so a plane table survey was undertaken to determine the nature and extent of the iron deposits and associated minor manganese mineralization at Penguin Creek and Iron Cliffs.

Location and Access

The northern end of the old Penguin Creek iron workings is two miles south of the headland at the western end of Penguin Beach, and the southernmost iron outcrop, the Iron Cliffs, is three and one half miles south of the headland (as shown on Figure 1).

A small jetty once existed for loading iron ore into lighters at the western end of Penguin Beach, but large vessels would require a jetty more than 400 yards out from the headland. Alternatively there is a single-track rail line from Penguin to the port of Burnie, a distance of eleven miles.

History

The Penguin Creek deposits were worked by the Tasmanian Iron Company (J. C. Ellis) from 1897 to 1909. During that period 40,000 tons of picked ore was shipped to N.S.W. for use as flux in smelting furnaces, and the ore was selected so as to contain not less than 66 per cent iron.

These deposits and the Iron Cliffs Lode were first reported on by Montgomery in 1895, then Harcourt Smith in 1898 and Twelvetrees in 1903, 1905 and 1919. They considered that the Iron Cliffs Lode was not related to the Penguin Creek deposits and may be the oxidized outcrop of a sulphide body. To test this theory, the Department of Mines commenced a diamond drill hole in 1959.

SURVEYING

The plane-table survey of the deposits is not quite complete, in that the most northern quarry of the old Tasmanian Iron Company was not plotted, and the positions of Ferndene Creek and the iron cliff at the creek fork were plotted by eye. The contoured portions of Figure 2 were surveyed, and the sketched portions are shown by broken lines.

Geology

The area surveyed, as shown on Figure 2, contains few reliable outcrops, and much of the iron-bearing soil is covered by bracken and blackberries. The principal geological evidence comprises the exposures in pits and quarries, a few disconnected outcrops, and the soil and scree. Thus, the interpretation of this evidence depends

greatly on knowledge of the stratigraphy and structure in the general area as provided by Messrs. T.D. Hughes and K.L. Burns of the Department of Mines.

The iron occurs in predominantly sedimentary rocks of pre-Ordovician age. The Dial Range, to the east of the iron deposits, consists of Ordovician conglomerate preserved along the axis of a syncline. Beneath the conglomerate, with probable unconformity, is the iron-bearing sequence of arkose, fine micaceous sandstone and micaceous slate, with probable acid volcanics including breccia and tuff. On either side of Penguin Creek, these pre-Ordovician sediments are unconformably overlain by conglomerate, grit and basalt, probably deposited in post-Miocene time on a rough erosion surface.

At the northern end, in the quarries on the freehold land held by A.N. and E.A. French and in A. Pearson's two quarries, the iron occurs as very soft friable limonite and both earthy and specular hematite, partly or wholly replacing the sediments and breccia. The replacement is in vertical bands from ten to thirty feet wide, which persist to a depth of 60 feet in the deepest quarry. The friable ironstone contains pebbles and boulders of hard hematite and some of limonite and quartzite, and the topsoil is a friable red soil with hematite, limonite and quartzite pebbles, boulders and some massive outcrops. The lump ore occurred to a depth of at least 50 feet in the old quarries.

The ironstone soil continues south through E.G. Crawford's freehold into the freeholds of T.B. Adlard on the western side of the road and W. and L. Blair on the eastern side of the road. On the Blairs' property four small pits have been driven into a prominent outcrop of hard hematite and an adit was driven from one pit. These showed that hard hematite and quartzite near the surface passed down within a few feet into a friable specular hematite and limonite with unreplaced sediments in place of quartzite. Here also the zones of replacement, although somewhat irregular, appear to have a vertical trend.

On the southern edge of the area of hematite outcrop, there are massive outcrops of limonite which can be traced intermittently up the rise to the east into S.D. Kaine's freehold. From here the intermittent outcrops can be traced south through the edge of F.N. Hardy's freehold to the bold outcrops of the Iron Cliffs Lode in the scenery reserve along Ferndene Creek. Near the south-western corner of Hardy's freehold the base of the limonite dips at about ten degrees east and rests on micaceous slate or phyllite with its micaceous foliation or bedding parallel to the base of the limonite. The limonite outcrops appear to represent three bands of replacement with some micaceous slate between, and hematite is common in the upper bands.

Below the Iron Cliffs limonite horizon there are pebbles and scree of micaceous slate with only a few pebbles of limonite, manganese and barytes on the higher slopes.

It seems likely that the Iron Cliffs Lode is related to the Penguin Creek deposits in that it may be the basal horizon of replacement. The massive hematite and limonite may be the result of Miocene lateritization, which would explain why the main outcrops occur near the base of the basalt or Tertiary conglomerate and grit. The Iron Cliff face is possibly a fault plane with downthrow to the south. Thus the basal limonite has been lateritized and remains as the cliff north of the fault, but the ironstone was downfaulted below the level of lateritization to the south and was not hardened. If this is so, the Department of Mines' drill hole should pass through the fault zone into pre-Ordovician sediments.

Testing

Sampling

Four samples (TS1 to TS4), each between ten and fifteen pounds weight, and were taken from the face of A. Pearson's southern quarry about fifteen feet below ground surface. A composite sample of these four should be representative of the general tenor of the whole quarry.

One random sample was taken of all lump material plus two inches in size from the soil stripped from A. Pearson's southern quarry (TS5).

Four samples were taken from faces in the clovershaped quarry on the freehold of W. and L. Blair. TS6 was taken near an adit portal more than 20 feet below ground level, but TS7 to 9 were taken about 6 to 10 feet from the surface. TS9, about 6 feet from the surface, shows hardening of the hematite and silicification of the gangue. All samples are between ten and fifteen pounds weight and are representative of the types of rock visible in the quarry.

Two specimens of limonite (TS10 and TS11) were collected from the Iron Cliffs Lode near the crest of the ridge.

Assaying

The samples have been forwarded for assay, but the results are not yet available.

W. C. Smith

W.C. Smith.

WCS:DM
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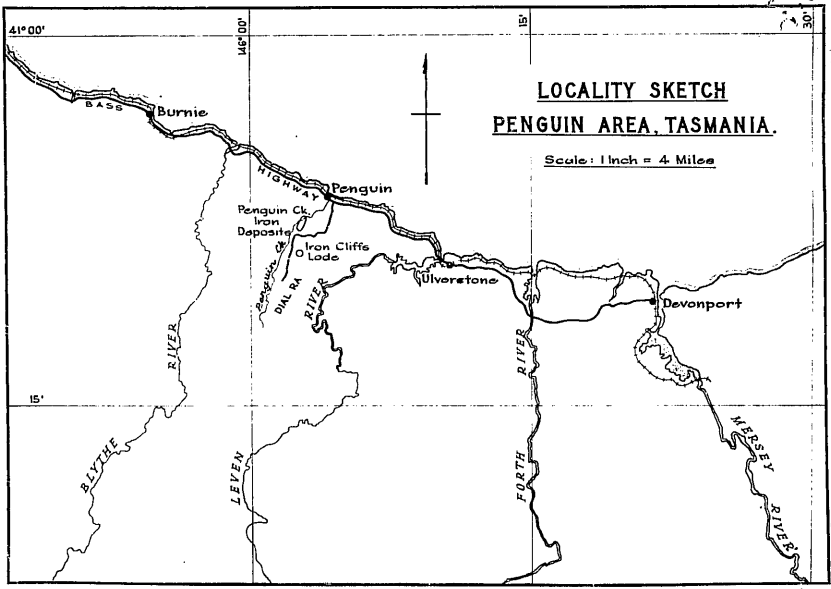
41°00'
146°00'
15'
30'
LOCALITY SKETCH
PENGUIN AREA, TASMANIA.
Scale: 1 Inch = 4 Miles
BASS
Burnie
HIGHWAY
Penguin
Penguin Ck. Iron Deposits
Iron Cliffs & Lode
DIAL RA
RIVER
Ulverstone
Devonport
BLYTHE RIVER
LEVEN
FORTH RIVER
HERSEY RIVER
15'

FIG. 1.

FIG. 2.
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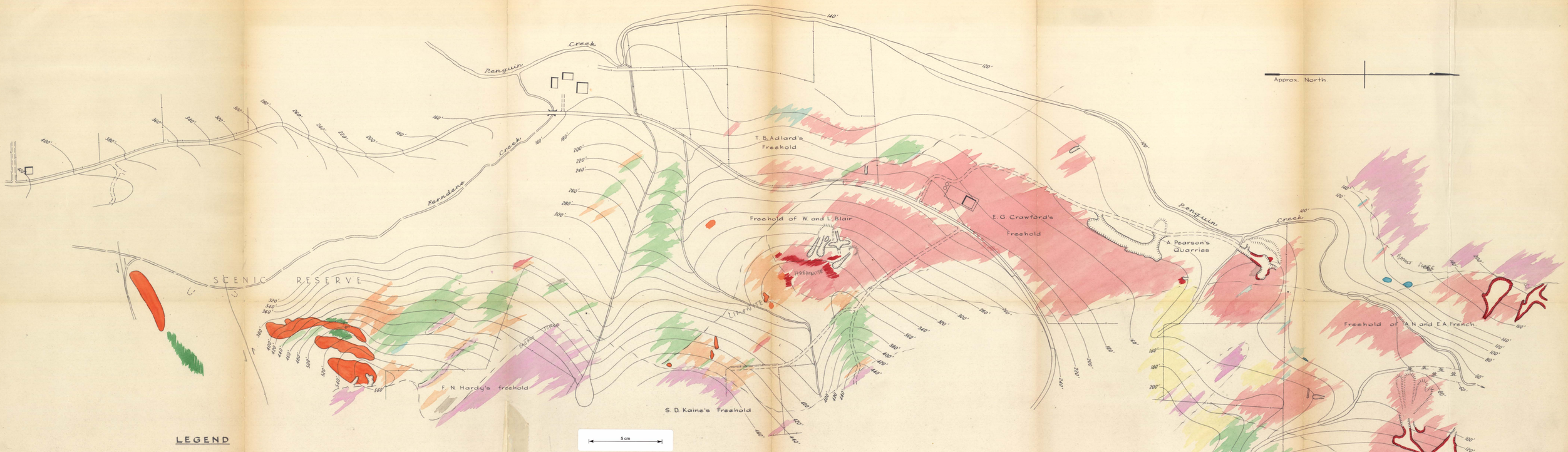

LEGEND

- Basalt scree
- Tertiary conglomerate and grit scree.
- Pre-Ordovician sediments scree.
- Quartzite scree.
- Limonite scree.
- Hematite scree.
- Manganese scree
- Pre-Ordovician sediments outcrop.
- Quartzite outcrop.
- Limonite outcrop.
- Hematite outcrop.

PENGUIN CREEK IRON DEPOSITS AND IRON CLIFFS LODE PENGUIN - TASMANIA

Scale : 1 Inch = 200 Feet

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