MACQUARIE HARBOUR BROWN COAL DEPOSITS

LOCATION AND ACCESS:

Macquarie Harbour is represented by a large arm of the sea situated about the centre of the West Coast of Tasmania. The chief settlement is the township and port of Strahan located on the shore of Long Bay, at the northern extremity of the harbour.

Cargo steamers provide a regular service with the mainland States to the ports of Sydney and Melbourne. Strahan is coupled by railway with Burnie and from there with the rest of the State.

A road passing through Queenstown connects with Hobart in a distance of 182 miles.

The various localities round the shores of Macquarie Harbour are made readily accessible by means of motor launches.

TOPOGRAPHY:

The land on north-eastern side of Macquarie Harbour, with which this report deals, rises sharply from the shore line, largely in the form of cliffsto a partly dissected terrace, 75 to 100 feet above sea level. A second terrace, not generally as prominent as the lower one, ascends to a further height of 125 feet at a half to one mile inland. Further east, at two to three miles from the shore, Mts. Strahan and Sorell mount abruptly and attain heights between three and four thousand feet above sea level.

A well defined platform at an approximate height of 1200 feet extends with an apparent gentle slope to the south, along the western fall of Mt. Sorell and defines the eastern extremity of the Western Coastal Plain. This feature is also prominent on the western scarp of D'Aguilar Range to the south-east of the Harbour.

Gordon River and King River, both of considerable size, flow westerly into Macquarie Harbour. The latter constitutes the drowned estuary of Gordon River. Other prominent streams having separate outlets in the Harbour, and which drain the West Coast Range and D'Anguilar Range, are Manuka Creek, Pine Cove Creek, Lignite Creek, Braddon River, Fish River, Bird River and Sorell River.

Sofia Point, Coal Head, Gould Point and Pine Point are conspicuous capes jutting into Macquarie Harbour from the north-east.

Numerous bays and inlets occur between the headlands, the more important of which comprise Long Bay, Lette Bay, Pine Cove, Farm Cove, Kelly Basin and Birch Inlet.

Phillip Island occupies a position in the Harbour at 1/5 of a mile from the mouth of Braddon River.

GEOLOGY:

Tertiary:

Sediments consisting of sands, lightly consolidated sandstones, clays, clay shales, and mudstones, with

thin seams of brown coal are present along the greater parts of north-eastern and eastern shores of Macquarie Harbour from Strahan to several miles south of Birch Inlet. These rocks are exposed along the headlands and adjacent localities in the form of cliff faces. The deposits extend inland over a belt one to two miles in width and attain a thickness, above sea level, of 50 to 200 feet. The total thickness is unkown since the rocks extend below sea level and older rocks are nowhere exposed to view near the water front. North of Kelly basin the sediments unconformably overlie limestones of Silurian age. The series shows marked bedding, particularly in the clay and shaely bands. The sandstones in some localities are distinuighed by cross or current bedding.

The strike of the strata varies from E 5° S to E 28° S and the angle of dip from 6° to 10° to the north.

No folding was observed and the strata appear to have been effected by a simple upward movement causing a slight tilting to the north.

The sandstones and clay shales indicate deposition in lacustrine or shallow estuarine waters with changes to terrestrial conditions during the formation of brown coal and lignite beds. The shale and mudstone beds are replete with leaf and stem fragments, while fossil resin is occasionally included. They are almost certainly of fresh water origin.

From the fossil evidence the series is regarded as being of Tertiary age.

PLEISTOCENE:

Unsorted gravels and sands, from one to 20 feet in thickness, disconformably overlie the Tertiary strata near the surface. The gravels consist of waterworn pebbles of siliceous types, and no large boulders are present.

This deposit is younger than the underlying Tertiary sediments and appears to represent fluvio-glacial material. It was probably laid down as outwash gravels from the morainal deposits exposed in road cutting above the second terrace to the north-east of Strahan and several miles further north along the railway line at Koyale (Mallanna).

ECONOMIC GEOLOGY:

Thin seams of brown coal occur in the lower members of the Tertiary sediments. They are exposed, principally in the base of cliffs, at various points along the north-eastern shore of Macquarie Harbour from Lette Bay to Farm Cove and have also been reported to the south west of Birch Inlet. The seams generally occur either immediately below or above high tide mark, but in one locality a narrow band is present up to 25 above sea level. Three, and possibly four, coal seams exist. These dip inland to the north with the enclosing strata at low angles. They vary in thickness from 5 to 18 inches and consist generally of brown coal and carbonaceous shale. The quality improves in various places where bright black lignitised wood is prominent in the form of lenses in the brown coal. Where exposed along the shore line the seams are overlain by 50 to 100 feet of clay shales, mudstone and sandstone. Further inland the overburden increases in thickness.

About the centre of Lette Bay, two miles south-east of Strahan a seam of brown coal 18 inches in thickness outcrops for about five chains along the pebbly beach and in a bank skirting the waterfront. For the greater part the coal is covered by water during high tide periods. The strike of the bed is E 25° S and dips to the north-east at an angle of 10°. The coal is imbedded in clay seams and the whole overlain by approximately 100 feet of semi consolidated sands, clays and gravels. The following proximate analysis illustrated the general character of the brown coal from Lette Bay.

	Per Cent
Moisture —	20.8
Volatile carbonaceous matter	33.45
Fixed carbon	33.5
Ash	12.25

Along the bay between Coal Head and Braddon River, the following section of strata is exposed in a cliff face over a length of several chains:-

50 to 75 feet	-	Semi-consolidated grey clay and clay sands.
6 inches	-	Brown coal with several minute bright bands of lignite.
4 "	-	Grey clay
6 "	-	Brown coal
3½ "	-	Grey clay
3 inches	-	Clay with narrow lenses of lignite. Sea level.

The dip of the strata in this locality is 10° to the north-east and the strike bearing 28°S.

Another cliff, about ¾ of a mile south-east of Braddon River, shows 6 to 9 inches of brown coal at beach level covered by 20 feet of soft sandstone. This is overlain by a 9 inch seam of brown coal which, in its turn is overlain by clay and clay shales containing possibly two further seams of coal.

At south-east end of Phillip Island, brown coal is visible about high water mark, to a thickness of 5 to 6 inches, enclosed in clay seams.

A typical exposure, 10 chains north-west of Gould Point, is illustrated by the succeeding section:-

50 to 75 feet - Clay shales with several 1 inch bands of lignite (plant stem impressions.)

Top seam - 12 to 15 inches - Brown coal with lignite and some fossil resin inclusions (sample analysed).

18 inches - clay shales

Middle seam -12 inches - Brown coal with lignite inclusions (sample analysed)

2½ feet - Clay shales (fragmentary leaf impressions)

6 inches - Lignite and brown coal.

Up to 12 inches - Clay with short and thin lenses of lignite.

Sea level.

At this locality the strike of the strata is E 5° S and dip 6½° to the north-east.

Proximate analyses of samples taken across the two seams indicated above returned the undermentioned results:-

Top Seam -	Moisture at 105°C	5.84	per cent
	Volatile carbonaceous matter	30.24	" "
	Fixed carbon	28.22	" "
	Ash	35.70	" "
	Sulphur	1.96	" "
Middle Seam -	Moisture @ 105°C	4.26	" "
	Volatile carbonaceous matter	22.20	" "
	Fixed Carbon	15.60	" "
	Ash	57.94	" "
	Sulphur	0.42	" "

CONCLUSIONS:

To render a Tertiary brown coal or lignite of economic importance it would be necessary to have a seam of good average quality, exceptional thickness and little, if any, overburden. As none of these provisions are complied with in the Macquarie Harbour deposits the coal seams cannot be regarded as of commercial value at present.

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