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GEOLOGICAL REPORT ON THE BRICK PIT AT DEAKIN, NOVEMBER, 1957

by

D. E. Gardiner & P. W. Pritchard



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## INTRODUCTION

The brick pit at Deakin was reopened as a result of a shortage of suitable brick making material near the Canberra Brick Works. During mining, limestone and calcareous claystone and siltstone were included in the material sent to the brickworks. The presence of either nodular or massive calcium carbonate renders this material unsuitable for brick making.

The pit is situated in Deakin on top of a low hill which lies within the rectangle formed by Adelaide Avenue, De Chair Street, Macgregor Street and Hopetoun Crescent. It occupies an area roughly 1200 feet long (north-south) and 800 feet wide (east-west) near the middle of this rectangle.

As this site is within the Canberra City Area, the Minister for the Interior, acting on the advice of the National Capital Planning and Development Committee, has stipulated that the quarry must not be excavated below the level of the 1930 feet contour, and that a levelled site suitable for building purposes must be left after the quarry is abandoned (Nye and Owen 1944).

## GEOLOGY

The pit lies on the faulted western limb of an anticline in claystone, siltstone and minor beds of sandstone and limestone which form part of the Red Hill Group mapped by Öpik (1953).

Stratigraphy. The oldest sediment mapped is the medium to massive bedded, medium to coarse grained tuffaceous sandstone which crops out to the east of the pit.

This sandstone is overlain by a sequence of siltstone and very fine to medium grained tuffaceous sandstone containing calcareous beds and limestone lenses and grading up into a medium bedded, medium to coarse grained feldspathic quartzsandstone that shows current bedding. These beds are exposed along the eastern side of the pit. They are probably part of the transition between the Deakin Volcanics and the Yarralumla Formation (both in the Red Hill Group) mapped by Öpik (1953).

A shear separates this sequence from one consisting mainly of laminated to thick bedded and occasionally massive, buff, olive, purple and grey claystone, siltstone and sandy claystone and siltstone with lenses and thin beds of friable, medium to coarse grained feldspathic quartz sandstone. Near its base there is an olive-grey laminated to thin bedded siltstone with limestone lenses. This unit is exposed in the north eastern corner of the pit. A bed about fifteen feet thick consisting of hard purple and green, laminated and thin bedded, claystone and siltstone which has concentrations of quartz and feldspar grains in bands one to three inches thick and up to two feet apart crops out in the eastern part of the pit. This bed is underlain by a three feet thick bed of medium to coarse grained feldspathic quartz sandstone and is overlain by a unit containing two beds, one three feet thick and the other two feet thick, of medium to coarse grained feldspathic quartz sandstone which are separated by two feet of buff sandy siltstone. On the western side of the pit a bed about ten feet thick containing limestone lenses crops out. It is overlain by a medium to coarse grained feldspathic quartz sandstone about eight feet thick. Sporadic outcrops of olive claystone and siltstone occur to the west of the pit.



This sequence of claystone and siltstone with minor bands of sandstone and lenses of limestone is part of the Yarralumla Formation mapped by Opik (1953).

A sill-like intrusion of quartz porphyry crops out on the western side of the pit.

Structure. The pit lies on the western limit of an anticline disrupted by a normal fault, which runs roughly north-south with the downthrow side on the west. This fault has brought the transition between the top of the Deakin Volcanics and the base of the Yarralumla Formation into contact with higher beds of the Yarralumla Formation.

On the western side of the pit the sediments dip to the south east at  $60^{\circ}$ . The dip decreases to  $30^{\circ}$  in the eastern part. Overturned beds crop out over a distance of a few feet along the small shear running through the south eastern corner of the pit. On the eastern side of the easternmost shear minor folding is present. All the minor folds plunge roughly south at  $3^{\circ}$ .

Throughout the pit the sediments show strong cleavage and jointing. In the south-eastern part of the pit calcite lines the joint surfaces.

It is thought that the faulted area running along the eastern side of the pit was the site of a small dragfold on the side of an anticline in the Red Hill Group, and that this feature controlled the location of the subsequent shearing.

#### MATERIAL AVAILABLE FOR BRICK MAKING

Nearly all the suitable brick making material above the 1930 foot level has been removed. This material was apparently buff and olive, fractured and weathered claystone and siltstone containing only a small amount of sand. Most of this material came from the eastern side of the pit, where the folding and shearing had probably made the sediments more susceptible to weathering. A few feet of weathered material has been removed from over approximately three quarters of the area of the pit, and in the centre and on the western side blocks of buff and olive claystone have been excavated down to the 1930 foot level.

Suitable fractured and weathered material is still present below the pit floor along the eastern side between the easternmost shear and the purple and olive claystone and siltstone that runs down the centre of the pit. Some material may also be available on the western side of the pit.

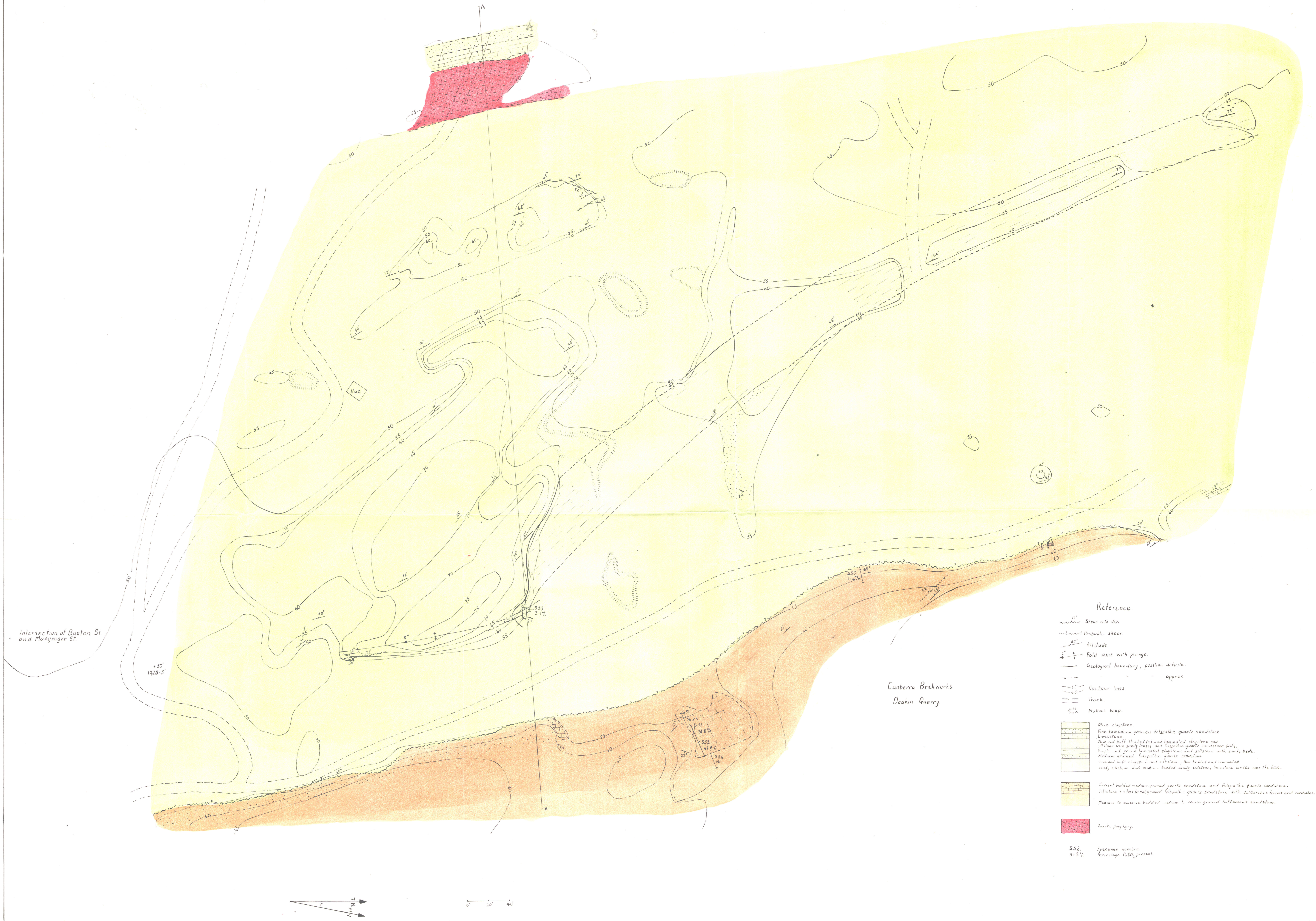
Before an estimate of reserves can be made, both of these areas would have to be tested to find out how deep weathering extends. Most of the remaining material is less weathered and harder than that already quarried, but it would probably be suitable if mixed with softer material from the brickworks' new Belconnen pit.

Further excavations of suitable material in the Deakin pit will carry the quarry floor below the level of the 1930 foot contour. However, a large quantity of unusable material remains above this level, and this can be ultimately bulldozed into any excavations made of good material.

#### REFERENCES

- Nye, P.B., and Owen, H.B., 1944. Geological report on a site for a brick pit at Deakin. Min. Resour. Surv. Rep. 28/1944. (unpub.).
- Opik, A.A., 1953, Geological map of Canberra. Bur. Min. Resour. A.C.T. G.2-12.





Reference

- ~ Shear with dip.
- ~ Probable shear.
- 60° Attitude
- ~ Fold axis with plunge.
- ~ Geological boundary, position definite.
- ~ approx.
- ~ Contour lines
- ~ Track
- ~ Muck heap
- ~ Olive claystone.
- ~ Fine to medium grained feldspathic quartz sandstone.
- ~ Limestone.
- ~ Olive and buff thin bedded and laminated claystone and siltstone with sandy lenses, and feldspathic quartz sandstone beds.
- ~ Purple and green laminated claystone and siltstone with sandy beds.
- ~ Medium grained feldspathic quartz sandstone.
- ~ Green and buff claystone and siltstone, thin bedded and laminated.
- ~ Sandy siltstone and medium bedded sandy siltstone, limestone lenses near the base.
- ~ Coarse bedded medium grained quartz sandstone and feldspathic quartz sandstone.
- ~ Siltstone and fine to medium grained feldspathic quartz sandstone with calcareous lenses and nodules.
- ~ Medium to massive bedded medium to coarse grained buffaceous sandstone.
- ~ Quartz porphyry.
- 552 Specimen number.
- 31.8% Abundance CaCO<sub>3</sub> present.



