Investigation of proposed pipeline route, Latrobe to Port Sorell.

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Abstract

A proposed pipeline from Dooleys Hill near Latrobe to Port Sorell will encounter no potentially unstable zones. The rocks along the route include Quaternary sediments, Tertiary sediments and basalt, Jurassic dolerite and Permian sediments. Trenching in the dolerite will be difficult and expensive; some of it cannot be avoided without major rerouting but two minor diversions are suggested near Appleby Creek. Like its counterpart on Dooleys Hill, the reservoir near Port Sorell will have no solid rock foundation.

INTRODUCTION

The North West Regional Water Authority asked for an assessment of possible geological problems along the route of a proposed pipeline from Latrobe to Port Sorell. Donaldson (1977) reported on similar investigations for the Devonport-Latrobe pipeline and included an assessment of the geology and site conditions at the proposed Dooleys Hill reservoir site. The present report is an extension of Donaldson's work.

GEOLOGY

Jurassic dolerite, Permian sandstone and mudstone, Tertiary sediments and basalt and Quaternary sand, alluvium and talus will be encountered along the pipeline route (fig. 1). Only the dolerite, and possibly associated talus, will present any trench excavation problems. All rocks are variously affected by weathering and it is sometimes difficult to predict the engineering properties of near sub-surface materials solely from surface indications. Large sections of the route are also devoid of outcrop. Wherever possible, information from adjacent bores and wells is used to supplement the surface geology. The locations of these are shown in Figure 1.

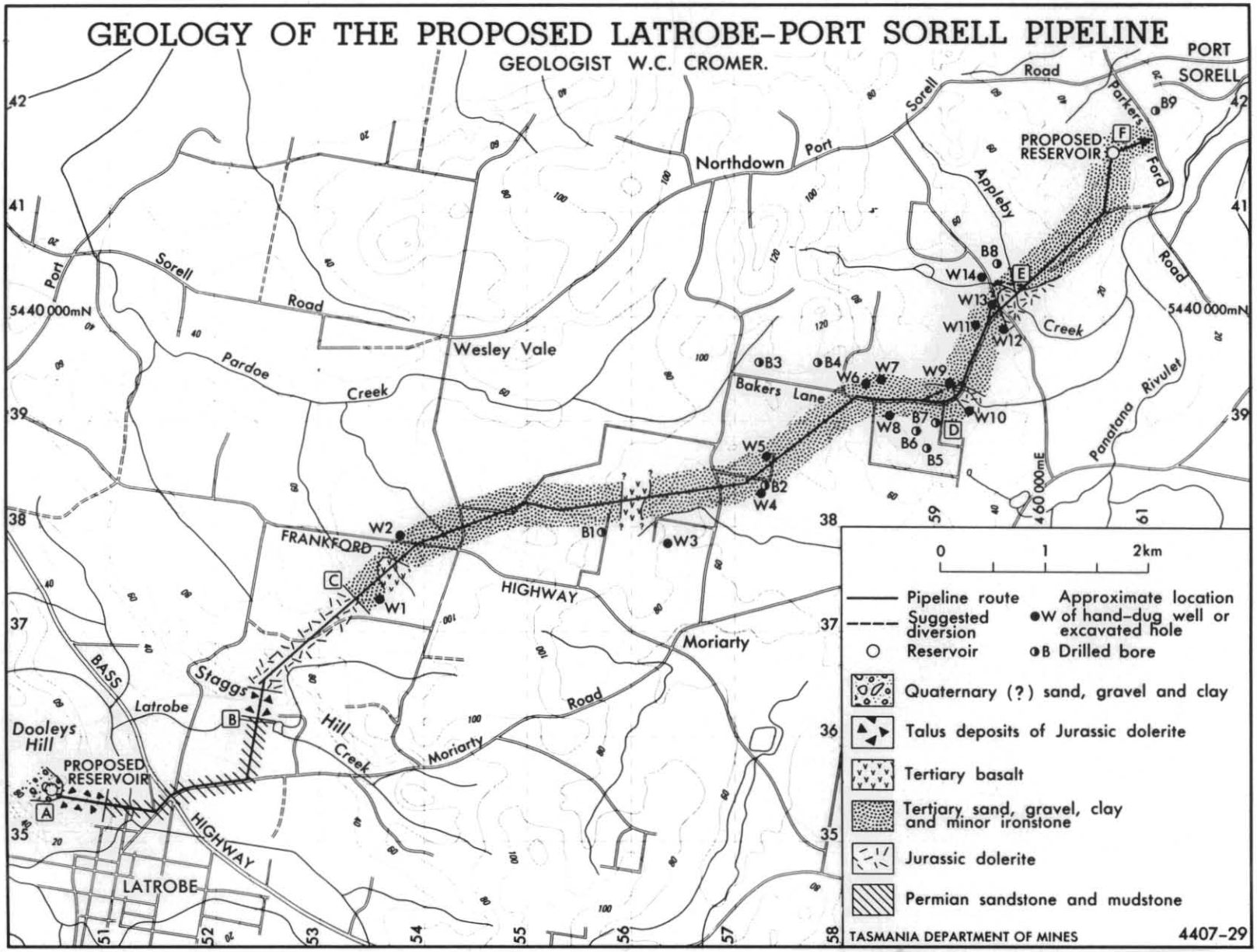
Section A-B (Dooleys Hill to Latrobe Creek)

The talus on the steep eastern side of Dooleys Hill is compact and deeply weathered. Recent road cuttings show it to be at least 3 m thick in places, composed of massive angular blocks of dolerite in all stages of weathering and set in a clayey matrix. Occasional fresh boulders of dolerite a metre or more in diameter will be encountered. These may need blasting, but otherwise excavation in the talus will not be difficult. Problems may arise if the trenches encounter the underlying *in situ* dolerite, or near the top of the hill where the talus is thin. The rest of the section is flat lying and excavations will encounter mottled grey-orange clay developed on weathered Permian sandstone and mudstone.

Section B-C

This is the most difficult section along the pipeline; dolerite underlies the whole of the Staggs Hill horst and it is difficult to avoid the rock without major diversions.

On the southern slope of Staggs Hill, loose dolerite talus overlies Permian sandstone and mudstone and Jurassic dolerite. No demonstrably *in situ* material occurs below the crest of the hill, but the loose talus will be a problem when trenching. Blasting will certainly be needed from the crest of the hill to point C, since massive—well jointed fresh dolerite


GEOLOGY OF THE PROPOSED LATROBE–PORT SORELL PIPELINE
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PORT SORELL
Road
Sorell
Parkers
Ford
Road
Northdown
Port
Appleby
PROPOSED RESERVOIR
F
B9
B8
W14
E
W13
W11
W12
Creek
Road
5440 000mN
Port
Sorell
Road
Wesley Vale
Pardoe
Creek
B3
B4
W6
W7
W9
Bakers Lane
W10
B7
W8
B6
B5
D
W5
B2
W4
Panatana Rivulet
4 60 000mE
FRANKFORD
W2
B1
W3
C
W1
HIGHWAY
Moriarty
BASS
Staggs
Latrobe
B
Hill
Creek
Road
Moriarty
Dooleys Hill
PROPOSED RESERVOIR
A
HIGHWAY
LATROBE
0
1
2km
Pipeline route
Suggested diversion
Reservoir
Approximate location of hand-dug well or excavated hole
B Drilled bore
Quaternary (?) sand, gravel and clay
Talus deposits of Jurassic dolerite
Tertiary basalt
Tertiary sand, gravel, clay and minor ironstone
Jurassic dolerite
Permian sandstone and mudstone
TASMANIA DEPARTMENT OF MINES
4407-29
5 cm

Figure 1.

either crops out or is concealed by thin sandy soil. Consideration should be given to laying the pipeline on the surface in this area.

Section C-D

This section crosses the north-south trending Wesley Vale Basin, a broad deep depression filled with Tertiary sand, clay, gravel and basalt and bounded by the dolerite basement on Staggs Hill and near Appleby Creek.

Most of the section is underlain by the sand and clay of the Wesley Vale Sand which is easily excavable. Wells 1-10 have all been dug in these sediments to depths of up to 10 m and the fact that all are unlined suggests the material is compact and unlikely to collapse during trenching. Bores 1 and 2 intersected 30 m and 17 m respectively of sand and clay. Small areas of basalt will be encountered but the rock is usually deeply weathered to a red-brown earth. Solid rock will not be encountered and blasting should not be needed. Bores 3 and 4 drilled on basalt areas passed through 33 m and 63 m respectively of clay (weathered basalt) and sand. The log of bore 5 is not available, but bores 6 and 7 passed through 17 m and 30 m of sediments.

So that the trench does not act as a collector drain for rainwater and seepage in the section between wells 4 and 6, it should be backfilled with the excavated material and well compacted. There is no obvious evidence of former slope instability and slope angles are low, but weathered basalt clay and sandy clay may become unstable if excessive water is present.

Section D-E

In this area, the pipeline crosses the dolerite horsts which separate the north-south trending Wesley Vale and Port Sorell Basins. Fortunately the route by-passes most of the dolerite, but it does intersect (at D and E) the northerly extremities of a large dolerite mass. In both cases, solid dolerite crops out and blasting will be needed. Accordingly, two minor diversions have been suggested to avoid these problems. If these are accepted, the route will lie entirely in sand and clay and should present no problems. Wells 11-14 are excavated springs dug to depths of about 4-6 m. All are unlined, suggesting the material is compact but excavable. Bore 8 intersects 18 m of sand and clay before striking dolerite.

Section E-F

No problems are envisaged in this section, which extends into the Port Sorell Basin. A considerable thickness of sediments and occasional basalt is present. The reservoir site will therefore lack solid footings but no stability problems will arise with adequate construction methods.

CONCLUSIONS

Extensive and expensive blasting will be needed on Staggs Hill unless the pipeline is laid on the surface. Re-routing here is probably not feasible. South of Bakers Lane (between wells 4 and 6) the clay and gravelly clay backfill should be compacted to reduce infiltration. Two minor diversions around dolerite in Bakers Lane and near Appleby Creek will avoid the need to blast the trench. The rest of the route should present no engineering problems.

REFERENCE

DONALDSON, R.C. 1977. Investigation of proposed pipeline route, Devonport and Latrobe. *Unpubl.Rep.Dep.Mines Tasm.* 1977/55.