UNDERGROUND WATER RESOURCES OF THE DELORAINE MUNICIPALITY.

GENERAL.

The Deloraine Municipality has a total area of approximately 1245 square miles of which the Western portion becomes mountainous and rugged and where the chief occupation is saw milling. Little or no agriculture is carried out and no attempt was made to examine the underground water potential of that portion of the municipality. On the eastern side of the municipality the country becomes less rugged and broad plains and alluvial flats occur. It is on this eastern section of the municipality that general farming and dairying is carried on and represents the area which is the subject of the present report. The area examined comprises some 260 square miles of country extending from Exton in a westerly direction to Mole Creek and from the township of Meander northerly to the Parkham district. The principal town of the municipality is Deloraine whilst other smaller towns are Elizabeth Town, Chudleigh and Mole Creek.

TOPOGRAPHY.

The area under review is one of only medium relief with hills of only moderate height separated by comparatively large areas of alluvial flats. To the south and south west of the area the country becomes much more rugged and mountainous culminating in the Mountain range The Western Tiers. Only two streams of any importance occur within the area examined. The Mersey River marking the Western boundary of the area flows in a general northerly direction to enter the sea at Devonport whilst the Meander flows first in a northerly direction till Deloraine is reached when its course becomes easterly till it joins South Esk River at Hadspen. The Rubicon River is a comparatively small stream flowing northerly to enter the sea at Port Sorell.

ACCESS.

The Deloraine area is readily accessible either by road or railway from either Launceston or Burnie, the rail distances to Deloraine being 45 and 67 miles respectively and the road distances being 30 and 65 miles. Within the area good second grade roads give ready access to all points.

METEOROLOGICAL DATA.

The following rainfall data has been supplied by the Commonwealth Meteorology Department with respect to the places named in the Deloraine Municipality. The table shows the monthly rainfall for the year 1950 and also the average rainfall for the period of records.

The figures show that for the year 1950, regarded as a dry year throughout the state, the Deloraine rainfall totalled approximately 39 ins. against an average yearly fall of approximately 35 ins.

Year 1950		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Deloraine		198	262	101	269	-	119	613	658	465	684	524	-
"	av.	189	-	218	276	334	421	454	420	380	342	249	244
Parkham	av.	173	-	169	-	384	-	-	-	-	-	-	-
Meander		122	-	93	195	269	110	569	489	410	736	377	333
"	av.	217	-	281	256	374	409	575	541	413	294	260	277
Mole Creek		80	-	-	-	-	-	-	-	-	-	-	-
"	av.	77	275	218	305	458	488	609	569	486	416	276	269

PREVIOUS REPORTS.

In the year 1924 A. McIntosh Reid, then Government Geologist, reported on "The Oil Shale Resources of Tasmania" as Geological Survey publication Mineral Resources No. 8. During his investigations Reid mapped a considerable portion of the area now under review and worked out the Geological sequence. The present map embodies most of Reid's mapping but has extended the mapped area principally in northerly and westerly directions in the vicinity of Parkham and Mole Creek respectively.

GEOLOGY.

Cambrian The oldest rocks in the area are a series of Mica Schists, Schists, Slates and Quartzites which traverse the area in a general westerly direction from Golden Valley through the Needles to the Mersey River. Reid has mapped these rocks as Pre-Cambrian Quartz and Mica Schists, Conglomerates and Slates, Cambrian Sandstones and Slates and Ordovician porphyroid igneous Schists, Syenites etc..

In that portion of the area recently mapped the observations were made principally by road traverses. There is no apparent reason for believing that the rocks are divisible into groups and from observations made would appear to be similar in character throughout. They have therefore not been differentiated and have been allotted to the Cambrian.

Ordovician Limestones of Ordovician age occur in the Mole Creek district as fairly prominent and rugged hills. They have been traced as far south as the Caveside district. Small outcrops of Limestone occur in the alluvial flats of Mole Creek and Chudleigh.

Permian Sandstones and shales of Permian age are widespread in the mapped area. Over the southern boundary of the area the hilly country is composed of sandstones and shales of that age in which the shales show abundant fossil evidence of age. On the northern boundary also the permian strata occur with fossil evidences as to age occurring in the back road from Deloraine to Parkham.

Mesozoic Dolerites of mesozoic age occur as a broad area extending from Elizabeth Town to Exton broken only by the river flats of the Meander River.

Tertiary In the mapped area Reid has recorded some sedimentary Sandstones particularly in the Parkham area. These have been traced in unbroken sequence to the Permian sandstones occurring in the near vicinity and have now been included with the Permian.

An extensive area of Tertiary Basalts occurs extending, except for a narrow band of recent alluvium at the Meander River at Deloraine, as an unbroken belt from Exton to Moltema. The Basaltic soil resulting from the weathering of the Basalt supports the greater part of the farming anddairying industry of the district. Basalts occur also as cappings for a series of belts between the Needles and Chudleigh.

Recent Recent sediments are widespread in the district. From Meander to Mole Creek in the south extensive plains extend with only occasional interruptions by hills of the older Permian strata.

Along the Rubicon and the Meander Rivers also extensive flats occur.

In the immediate vicinity of the town of Deloraine and extending easterly to Exton and westerly to beyond Moltema there is an extensive area of Basalt and Basaltic soil. The soils have resulted from the weathering in situ of the Basalt and wells already sunk have shown that the weathering has penetrated to a considerable depth. From the wells also it is evident that in most instances water is procurable at shallow depths in the soils, seldom more than 30 feet deep. There is little evidence available as to the total thickness of the Basalt for in only one instance have the underlying strata been penetrated. This one instance is the well at Dunorlan on the property of Little Bros. The well was completed long ago and there is no record of the underlying strata. It was stated by Mr. Little however, that there was no water above the Basalt but when the Basalt was passed through water was met. The depth of the well is 62 feet, the water is hard but the stock drinks it. It is, therefore, a reasonable assumption that the Basalt is a comparatively thin cover and should not anywhere exceed 100 feet in thickness.

From the number of wells already put down in the Basalt area it can be assumed that anywhere in that area water will be won from bores or wells put down and that in most cases it will not be necessary to bore through the unweathered Basaltic as the overlying soils have been proved to be water bearing.

On the southern boundary of the mapped area, extending from Meander to Western Creek there is a series of comparatively high hills composed of Permian sandstones and shales. To the north of these hills there is an extensive area of tertiary and recent sediments which extend almost to the Needles as a large plain broken only by occasional Dolerite hills. On the north-western boundary of this plain there are some comparatively high hills of Permian sediments capped by Basalts. Throughout this plain it is anticipated that water will be obtained at shallow depths either by bores or by wells.

From Chudleigh, extending in a southerly direction to Caveside to junction with the plain described above a further area of tertiary and recent sediments occur along the course of Lobster Creek. Small outcrops of limestone within this area suggest that it is underlain by limestones at no great depth. Wells put down have obtained water at a few feet from the surface but have not penetrated to bedrock. On the eastern side of this area hills of Permian sandstones occur which are capped with Basalt.

Springs occur at several points along the hillside at the base of the Basalt and where there is little soil cover on the Permian rocks. The western side of the flat is flanked by hills of Limestone which extend westerly to the Mole Creek area.

To the south of the township of Mole Creek and towards the head of Mole Creek itself a narrow alluvial flat occurs. It is flanked on either side with hills of limestone and as the limestones outcrop in places within the flat it must be assumed that limestone will occur at shallow depths below the surface.

In the Parkham area, there is also an extensive flat of tertiary and recent alluvium which should yield water at shallow depths. At the time of this inspection most of the Parkham area was well supplied with water.

It is in the Parkham area more than in any of the other areas where an extensive area of Permian sediments occur and have been cultivated. Several intending applicants for bores reside here and although several springs have been noticed in the area there can be no certainty of water from these strata.

The area is favourably situated in that there are numerous hills and valleys in the Permian area and as the strata are more or less horizontal the gravelly beds outcropping on the slopes of the hills may act as intake beds for limited areas and may therefore give rise to an underground source of water.

The following farmers have been interviewed and have expressed their desire to have bores put down on their properties. In several instances more than one bore will be required :-

(1) R. Cooper, Moltema.

Mr. Cooper's property is shown on the land chart as that purchased by A. J. Skirving with an area of 144 acres 1 rood 17 perches. It is situated on a bye-road which branches to the east at the Salvation Army Hall about 1½ miles north of Moltema.

At present Mr. Cooper is pumping water from a small creek flowing through his neighbours property. The property is situated on a dolerite hill and will depend on the weathering of the dolerite to depth to give sufficient soil cover to provide a resevoir for underground water. Springs at a lower level on the hill suggest that a small supply will be assured.

(2) L. Tracey, Moltema.

Mr. Tracey's property is situated to the west of the Moltema Kimberley road, approximately 1½ miles north from Moltema.

The present water supply is from a spring issuing about half a mile from the homestead. This supply has always been sufficient for the eastern portion of the holdings but the Western portion is at present without water.

A previous well sunk approximately on the boundary of his 34 acre block has collapsed. The holdings are situated within the area of Basaltic soils and close to the Collier Creek. A bore site was selected in company with Mr. Tracey.

(3) Griffin Bros., Moltema.

Griffin Bros. present house supply of water is

obtained from a well which has yielded a constant supply sufficient for household purposes and for the watering of stock in the home paddocks. A second well situated to the north of the house is 38 feet deep and has approximately 6 feet of water in it. The well is fitted with a concrete tank of 6000 gallon capacity. It is desired to augment the water supplies by boring at a site to the east of the house. A bore site here has been selected. Further bores may be required on this property.

(4) Mr. T. O'Geary, Moltema.

Mr. O'Geary has a well which supplies the Homestead and his property is fairly well watered. It is intended to bore to augment present supplies in some of the paddocks to the north west of the Homestead.

(5) Little Bros., Dunorlan.

It is at Little Bros. farm where the well has passed through the Basalt to the underlying sediments at a depth of 62 feet. The well yields a constant supply of water.

Two bore sites have been selected close to and to the west of the homestead and a third bore site to the north east of the Homestead on the extension of the property across the railway line.

(6) Atkins Bros & R. Atkins, Dunorlan.

These properties adjoin each other and are situated immediately to the south-west of the Dunorlan Railway Station. The present water supplies are sufficient for household purposes but both parties are anxious to augment supplies by boring. The properties are both situated on an area of Basaltic soil which should yield a supply of water. Should the soil cover not be saturated then there is no great thickness of Basalt and an assured supply can be won from the underlying sediments as has been done at Little Bros. property less than half a mile distant.

(7) W. Eeles, Weegina.

Mr. Eeles has an assured supply of water for household purposes but is lacking in water in all his paddocks for stock purposes. It is his desire that several bores be put down on his property to relieve this position.

(8) C. M. Walker, Parkham.

Mr. Walker has a shallow catchment conserving spring water near his house. Most of his paddocks are fairly well watered but he is anxious to augment the household supply to enable him to instal milking machines etc.. A bore site was selected where it is anticipated a small but sufficient supply would be obtained.

(9) A. P. Campbell, Parkham.

Mr. Campbell is dependent on tanks for his household supply of water and on his neighbours creek for watering his stock. The property is situated on hills of Permian sandstones which are not regarded

favourably as acquifers but from which limited quantities of water may be won.

(10) F. Cameron, Chudleigh.

The property is situated about three miles south from the Chudleigh Railway Station, the greater part of the holdings being situated to the west of the road on alluvial flats where water is assured. It is from a well on the flats that the present supply is won and is delivered by pumping to a tank some half a mile distant on the slopes of the hill to the east of the road. The household supply comes from a well on the hillside near the house. Small springs issue from the hill side at the base of the overlying basalt. Mr. Cameron desires to test the hillside at several places by either the hand-boring plant or by the power plant.

(11) Mr. N. Meller, Moltema.

Mr. Meller's property is situated on the eastern side of the road between Dunorlan and Moltema and about 1½ miles from Dunorlan. Mr. Meller has sunk a well to a depth of 50 feet which is at present in Basalt and has no water. If the well were continued till the Basalts were passed and the underlying sediments were penetrated a supply of water would be assured.

(12) Mr. T. McMahon, Dunorlan.

Situated on the road from the Bass Highway to Dunorlan just past its intersection with the road from Red Hills the property extends from the one road to the other. On its northern section the property is well supplied by springs and a well but on its southern end there is no water supply and it is Mr. McMahons intention to bore.

(13) Mr. W. Lee, Mole Creek.

Mr. Lee has made repeated unsuccessful efforts to obtain water by well sinking. In one instance a depth of 70 feet was reached. The property is situated near the boundary of the limestones on the tertiary and recent sediments. It is anticipated that with greater depth water will be won.

(14) Mr. Geo. Davey, Mole Creek.

Mr. Davey is interested in the boring campaign. His present supplies come from springs issuing from the hill side. It is not anticipated that large supplies will be won here.

Several other farmers of the district have expressed interest in the boring campaign. Most of the interested parties have properties situated on the Basaltic area, where the supplies depend on the depth of soil cover due to the weathering of the basalt. In all cases water should be won if not from the soil cover then from the sediments underlying the Basalt which at most should be only a relatively thin cover.

Two areas, one at Whitemore and one at the Oaks lying to the south of Hagley and Carrick, were visited. These areas lie outside the Deloraine Municipality. The areas are covered by a continuation of the Launceston Tertiary basin and the possibility of obtaining underground water will be comparable to that pertaining to the Longford district where results so far have been good.

A geological plan accompanies this report.

Signed: H.G.W.Keid M.Sc. M.A.I.M.M.

CHIEF GEOLOGIST.