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11 GEOLOGICAL REPORT ON THE RISDON BROOK DAMSITE

by I. B. Jennings

ABSTRACT

This report summarizes the geological problems involved in siting a major dam on the tilted and faulted sequence of Permian sedimentary rocks. The structure and stratigraphy of the area is discussed in relation to the dam. Clay seams in the bedrock could allow sliding and precautions are necessary to prevent this.

Introduction

The regional geology of the area surrounding Risdon Brook has been discussed in reports submitted by Spry (1960), Groves (1963) and Moore (this volume p. 77). Although rock outcrop is poor and similarity of lithological sequences restricts the accuracy of geological mapping considerably the rock distribution and structure have been established reasonably well on a regional scale (Figures 29, 30).

As noted in the earlier reports, the damsite is situated on a tilted block of Permian sedimentary rocks close to a major fault. The storage area is underlain by Permian siltstone, Triassic sandstone and shale and Jurassic dolerite. The boundary between the Permian and Triassic rocks is a major fault whilst the boundary between the Triassic rocks and the dolerite is difficult to interpret, being in part steeply intrusive and in part probably faulted.

Since few major structures in Tasmania have been founded on siltstone of the Permian Ferntree Formation no great body of precise knowledge was available concerning the engineering properties of these rocks. Also the siting of a major dam on gently dipping sedimentary rocks presents a series of unique problems demanding special investigations. As a result of the preliminary studies a number of problems emerged and an investigation has been made to determine the feasibility of the site. The investigations were designed to provide information on the following items:—

(1) The condition of the bedrock in the vicinity of the dam, the depth of weathering and the water-holding capabilities of the bedrock.

(2) The possible presence of a buried stream channel in the bed of Risdon Brook.

(3) The position and condition of the rocks adjacent to the Lindisfarne Fault at the damsite.

(4) The position and nature of other smaller scale faults in the vicinity of the dam.

(5) The presence and persistence of thin "clay" seams along bedding planes in the mudstone and the likelihood of such seams promoting sliding.

(6) The likelihood of leakage occurring from the reservoir through the saddle to the Grasstree Hill road.

The purpose of this report is to collate and present the information disclosed by the investigations carried out up to date. It is considered that from a geological viewpoint sufficient information is available to assess the feasibility of the proposal although further more detailed studies will be necessary for design purposes.

In the preparation of this report the writer has drawn heavily upon information available from the earlier works of Spry and Groves. Most of the detailed mapping at the damsite was carried out by W. R. Moore assisted for a time by W. L. Matthews. The logging of bore cores together with other detailed studies still in progress were also carried out by W. R. Moore.

Results of Investigations

(1) Drilling along the axis of the proposed dam indicates that the rock generally is sound and competent. Weathering has proceeded along some joints to depths of up to 50 feet in the abutments but below creek level most of the joints are closed or filled with a mixture of clay, pyrite and calcite. Grouting will therefore be necessary and it will probably be necessary also to remove some of the surface rock where blocks have rotated slightly around open joint planes.

(2) In the vicinity of the dam the general dip is to the SW resulting in a component across the dam as well as downstream. Clay-filled seams are present along the bedding planes and some of the joints and they vary in thickness from mere films up to 2 inches. They appear to be persistent over distances at least comparable with the base width of the dam.

(3) No buried stream channel is present in the vicinity of the damsite.

(4) The position of the Lindisfarne Fault is fixed reasonably well and some information is available as to its nature on the eastern abutment. Although further studies of this fault at the damsite are indicated, it is not expected to cause serious difficulties.

(5) Minor faulting has been demonstrated downstream from the dam. However, the presence of such faults is not expected to present serious difficulties with the dam in the present position. The fact that such faults disrupt both the bedding planes and associated clay seams may be advantageous.

(6) The problem of leakage through the saddle to Grasstree Hill road remains. An assessment of the probable magnitude of this leakage would be an extremely complex investigation and it is doubtful if precise figures could be obtained. The leakage path is relatively long, the beds locally, at least, dip in an unfavourable direction for leakage, and much shaly material is present in the sequence. These factors suggest that large scale leakage is unlikely to occur. However, this is only an opinion based on fairly meagre information.

Recommendations

For the purpose of this report the following recommendations apply to the siting of a dam up to about 100 feet high in the position indicated on the accompanying plan (Figure 30). Shifting the axis of the dam up or downstream by up to 100 feet would not materially alter the conclusions reached. However, movements in excess of about 200 feet would require further consideration and movements in excess of 400 feet would involve additional investigation. The recommendations apply to a gravity type structure and additional investigation would be necessary in order to assess the feasibility of alternative designs.

The evidence of the preliminary geological investigations indicates that it is feasible to construct safely a dam of the size and type indicated on the site selected provided that the designing engineers are able to satisfy the following conditions within the economic limits set by the building authorities.

(1) Provide sufficient loading or other features in the design to prevent sliding along the clay seams between the bedding planes. The preliminary tests indicate that this is quite feasible and can be satisfied by design considerations.

(2) In conjunction with (1) construct an effective grout curtain along the upstream face of the dam together with adequate relief drains behind this in order to eliminate or substantially reduce uplift pressures and to restrict or eliminate leakage. This also is clearly technically feasible.

(3) Some provisions should be made for grouting or sealing the Grasstree Hill road saddle if this should prove to be necessary. Under the worst conditions this could involve emptying the storage after it has been placed in service.

Geology

The following account is restricted to the rock units which outcrop in the immediate vicinity of the damsite. Descriptions of the rocks in surrounding districts have been supplied in earlier reports (see also this volume, p. 77).

TRIASSIC SYSTEM

The Triassic sedimentary rocks outcrop immediately upstream from the proposed damsite and are not in contact with the dam in its present position. They consist of thick units of medium grained quartz and feldspathic sandstone interbedded with mudstone and shale. The sandstone is massive, frequently cross-bedded and sometimes friable. The mudstone and shale are thinly bedded and micaceous and weather readily to micaceous clay. They fret rapidly on exposure to air. The combination of massive fairly competent sandstone units interbedded with weak shale leads to a predominance of sandstone in outcrop but the true proportion of shale to sandstone is probably much higher than is suggested by the outcrop. This combination of shale and sandstone also tends to promote gliding along bedding planes under appropriate conditions. This could conceivably occur at Risdon Brook when the storage fills but no evidence has been found for this in the past geological history.

The Triassic rocks exposed near the damsite have been correlated with the Springs Sandstone which is up to 600 feet thick in the type area but only about 250 feet can be demonstrated from the outcrops at Risdon Brook.

PERMIAN SYSTEM

Ferntree Formation

This is the uppermost formation in the Permian sequence and is the unit upon which the dam will be founded. In the type area the formation is about 600 feet thick but only 320 feet have been demonstrated from outcrop and drilling near the damsite. In the drill cores and outcrop the lithology is extremely uniform, the dominant rock type being a pebbly, muddy siltstone. The lack of contrasting rock types hindered investigation somewhat so that correlation of beds between drill holes could not be achieved. A few thin sandy beds were noted as also were some thin limestone and muddy limestone bands. These are indicated on the accompanying sections (Figure 29). A possible correlation between two thin limestone bands is suggested but the inference is that the remaining sandy and limy portion of the core are intersections of lenticular bodies. This is in accord with surface observations and no doubt accounts for the occasional lense-shaped cavities observed in cliff sections. These may be noted in the cliffs on the eastern abutment of the dam, a few hundred feet dowstream from the dam and in the quarry on East Risdon Road about $\frac{3}{4}$ mile south of the damsite. The cavities appear to be formed by the weathering out of limy concretions or sedimentary lenses. A small cavity of such type, about 9 inches long, was noted in the shaft near bore hole No. 4. Since such cavities would occur only rarely below the water table and would not be connected with one another they would not form major leakage paths.

The Ferntree Formation has strongly developed partings parallel to the bedding planes. The spacing between the major partings varies from about a foot up to several feet in natural exposures. At the top of the trench now being excavated on the western abutment there is a small exposure of thinly bedded mudstone with the partings only one or two inches apart. No similar unit has been observed elsewhere at the damsite.

In detail the rock consists of irregular interbedded laminae of silt and clay size material from about 1 mm up to a few mm thick which results in " curly " bedding in fine detail. Occasional pebbles and chips of slate, quartzite and other exotic rock types occur throughout the formation and distortion of the bedding beneath the pebbles suggests that they have been dropped into the soft mud and silt. The sediment has been regarded as being of glacial origin and this is probably so but the exact mechanism of sedimentation is complex and requires further study. A description of thin sections of the main rock types noted in the drill cores is appended (p. 120).

Whilst the rock itself is relatively impermeable, tough and competent the horizontal partings and strong joint system divide it into a series of rectangular blocks which, at the worst, are bonded together with thin " clay " seams. These seams are quite persistent within the limits of the exposures available and vary in thickness from films up to 2 inches thick along a single parting. Many of the joints above the water table are filled with similar material. Below the water table most of the joints are filled with a mixture of " clay ", calcite and pyrite.

Two samples of " clay " from seams along the bedding planes at the damsite and two from the quarry to the south have been forwarded to the University of Tasmania for mineralogical determination by X-ray diffraction. The diffraction patterns indicate that the "clays" are composed mostly of finely divided quartz with some feldspar and mica but that no true clay minerals are present. The following chemical analysis of one of the "clay" samples from the damsite is in accord with these findings.

	%
SiO_2	71.46
Al_2O_3	10.13
Fe_2O_3	2.78
FeO	1.68
MnO	0.05
TiO_2	0.57
P_2O_5	0.05
CaO	3.40
MgO	1.76
Na_2O	1.40
K_2O	1.60
H_2O —	3.35
H_2O +	1.67
SO_3	0.02
CO_2	Nil
	99.92

However, it may be noted that the ion exchange properties of the sample have not been determined and that if the particle size was less than about 10^{-5} mm, clay minerals if present may not be recorded. The evidence available, although not conclusive, strongly suggests that the material is finely divided rock flour. It could have many of the properties of clay.

Dips of the bedding planes in the Ferntree Formation are indicated on the accompanying plans and sections (Figures 29, 30). These indicate a general inclination to the W and SW but some relatively large variations in strike and dip have been recorded. These variations are attributed partly to the effects of nearby faults, partly to the difficulty of obtaining accurate dips on rocks of this kind and partly to slight rotation of blocks along the valley sides. The important features are a component of dip of about 4° to 5° to the west across the dam and a gentle dip downstream. The downstream component is desirable as the bedding planes will not be truncated by the valley floor downstream from the dam.

Risdon Sandstone

This formation outcrops beneath the Ferntree Formation a few hundred feet south of the damsite in Risdon Brook. It was also intersected in the drilling between 47 feet and 72 feet 2 inches in bore No. 8 (Figure 28). Between the two formations there is a transition zone 2 feet thick of sandstone with similar texture to the Ferntree Formation. The Risdon Sandstone consists of a single massive unit of feldspathic sandstone containing occasional pebbles of quartz and quartzite. Jointing is very widely spaced and bedding is absent. In the drill core the rock appears to be slightly friable in contrast to the surface exposures and a few strong joints dipping about 75° relatively to the core were noted. The sandstone drill core contains numerous irregular black patches of organic material. A petrographic description of a thin section (64-223) of this rock is appended. It is classified as a sub-greywacke in the sense of Pettijohn (1957).

Malbina Siltstone

Below 72 feet in bore hole No. 8 (Figure 28) the drill passed into a zone of broken rock containing much pyrite and with indication of movement along some of the joints. Beneath this the hole passed into dense dark grey to black mudstone to 81 feet 2 inches and finally into a grey siltstone similar to the Ferntree Formation to 82 feet 9 inches.

At the boundary of the Risdon Sandstone and Malbina Siltstone the rocks contained abundant pyrite in veins and replacing pebbles and probable fossils. The loss of core and the generally broken nature of this zone is thought to be due partly to movement and also to the solution of rock fragments, joint fillings and cement by sulphate-bearing groundwater. From an engineering viewpoint this zone forms a weak and highly permeable band at the base of the Risdon Sandstone. However, as this is the only intersection of this horizon by drilling the conditions could be local.

Structure

The rock distribution and geological structure is indicated on the accompanying geological plans and sections. The main fault just upstream from the damsite has been mapped for some miles and has been named the Lindisfarne Fault by earlier workers. Sub-parallel to this is at least one smaller fault which cuts across Risdon Brook 440 feet downstream from the damsite. Other smaller faults may also occur in the area though so far they have not been detected in the current investigations. In a relatively narrow block of sedimentary rocks bounded by two faults this is to be expected. Trenching now in progress on the western abutment will indicate with certainty whether any of these intersect the dam axis but the present indications are that they do not.

Lindisfarne Fault

Previous workers have shown that this fault has a displacement (downthrow to the north) of at least 250 feet and possibly more than 600 feet. On Figure 30 the position of the fault has been fixed by the distribution of outcrops, by exposures in two trenches on the east abutment and by the contact reported in a trench excavated at creek level just upstream from the dam. From this information the trace of the fault in plan is remarkably straight indicating that the fault plane is nearly vertical.

The only exposures of the fault zone are in the two trenches on the eastern abutment. In the vicinity of the fault the Permian mudstone is closely jointed, weathered and brecciated for about 20 feet whilst the Triassic sandstone is only very slightly brecciated but somewhat weathered for a few feet. In both exposures the fault plane is occupied by a narrow dolerite dyke. The dolerite is closely jointed and badly weathered and the dyke varies in width from 26 feet to 9 feet between the two trenches, but it may be discontinuous over a wider area. Thin sections of samples from the dyke rock (specimens 64-24 and 64-222) indicate that the rock has affinities with the Jurassic dolerite. Petrographic descriptions are appended.

The information available to date therefore indicates that the Lindisfarne fault is probably of Jurassic age; it is a vertical fault with limited brecciation and an unknown depth of weathering. However, no information is available as to the condition of the rocks in the vicinity of the fault in the bed of Risdon Brook.

Minor Faulting

Diamond drilling has demonstrated the existence of a small fault, indicated on Figure 30, crossing Risdon Brook 440 feet downstream from the dam. Surface mapping together with a study of the drill cores show that the fault must have a minimum displacement, downthrow to the north, of 65 feet. The trend of the fault cannot be firmly established from the information available and the position indicated on Figure 30 is based on drilling results and a study of distribution of outcrops. It should not be regarded as proven. Where this fault crosses the road east of Risdon Brook there is a narrow (4-5 feet) zone of brecciation.

On the eastern bank of the valley just downstream from the damsite the outcrops terminate abruptly, suggesting that a small fault may be present. Along the extension of this possible fault to the west there is a small gully across which the outcrops do not appear to match. The evidence for this fault at present is inconclusive but it is worth recording as a relatively small shift of the dam axis would bring the fault under the downstream toe of the dam.

Jointing

The strong joint system in the Permian rocks appears to offer a worthwhile field of study for structural geology. Detailed mapping of the joints in Ferntree Formation rocks along shore platforms at Lindisfarne and Eaglehawk Neck has shown a correlation between the joints and local faults. However, to obtain clear results from this work it is necessary to work on nearly perfect exposures in the first instance. Further work on this aspect of the structural geology will be carried out at a later stage.

Other geological studies in progress

(1) Arrangements have been made with the Bureau of Mineral Resources to carry out tests of the dynamic properties of the rocks at the damsite. Samples of drill core from the damsite have been forwarded for laboratory tests and a programme of field testing has been arranged for next field season.

(2) Samples of drill core have been obtained and will be forwarded for accelerated weathering tests.

(3) Drilling is now in progress on the final hole and drill core logs of this will be forwarded later.

(4) Excavation of a trench along the dam axis on the western side of the valley has been interrupted by mechanical trouble with the plant. Detailed mapping of this trench will be carried out when the excavation has been completed.

(5) Mapping of road sections along the Grasstree Hill Road has been completed. Details of this work will be forwarded later.

References

GROVES, D. I., 1963.—Geology of Risdon Brook Dam Site. *Rep. Dep. Min. Tas.* (*Unpublished*).

PETTIJOHN, F. J., 1957.—Sedimentary Rocks. Harper Bros.; New York.

SPRY, A., 1960.—Preliminary geological report on dam sites at Flagstaff Gully and Risdon Brook. *Private report to Gutteridge, Haskins and Davey* (*unpublished*).

APPENDIX

The following specimens were described by G. Everard:—

64-24. The specimen is a fine grained, greenish, weathered rock with some visible crystals of feldspar and ferro-magnesian minerals. In thin section the texture is partly ophitic and partly intersertal. Irregular prisms of pyroxene averaging 0.5 mm long are penetrated by narrow laths of feldspar of similar length. Small patches of this texture alternate with groups of feldspar laths, the interstices between the laths being filled with dark granular material, largely glassy. Magnetite is common in rodlike aggregates and small rounded masses.

Weathering has resulted in some staining of the rock by iron oxides; but apart from this, pyroxene is almost colourless and the rock is probably low in titania. Satisfactory interference figures could not be obtained from the pyroxenes owing to the small size of the crystals, but the slow ray made the smaller angle with cleavage in longitudinal section. Thus the pyroxene is probably pigeonite and the rock therefore related to the Jurassic dolerite.

The rock type may be described as a fine grained dolerite.

64-222. The hand specimen is a weathered, rounded fragment of a fine-grained greenish rock. Uneven weathering has resulted in prominent small green patches of less weathered pyroxene about 1 mm across on a more weathered, greenish-yellow background.

In thin section the texture is subophitic, the rock consisting of reticulate fine lathlike and acicular crystals of feldspar, showing lamellar twinning interspersed with irregular crystals of pyroxene which partly enclose the feldspar crystals. Crystallization of these two constituent minerals was simultaneous. There are also minute scattered grains of opaque white clay minerals and opaque black magnetite.

In the interstices between the feldspar crystals, a little colourless glass is present and may contain crystallites.

The rock is a basic dyke of tholeiitic type and possibly of Jurassic age.

64-223. In hand specimen the rock is a pale grey medium to fine grained sandstone, with streaks and patches of dark organic material.

In thin section the rock is a mosaic of angular quartz grains from 0.05 mm to 1 mm across and averaging 0.2 mm. The larger quartz grains are cracked and show undulose extinction. A little feldspar is also present mainly as larger grains showing twinning. Rock fragments of fine grained siliceous rocks are common, and there are also rare flakes of white mica and rounded grains of zircon. Interstitial material consists of fine grained quartz and sericite discoloured by dark carbonaceous material, which also obscures some of the rock fragments.

The rock is a sub-greywacke.

The following descriptions were prepared by M. J. Longman. They apply to thin sections of Ferntree Formation rocks from drill cores at Risdon Brook damsite.

The rock is siltstone containing minor beds of fine sandstone and limestone. Within the sandstone and limestone beds, the siltstone occurs as contorted wisps. Bedding is outlined by limonite and no grading was seen.

The siltstone is composed of angular to subangular fragments, averaging 0.02 mm and rarely reaching 0.4 mm in size, of quartz with minor quartzite, plagioclase, microcline, granophyre, quartz-plagioclase-microcline intergrowths, muscovite and biotite enclosed in a matrix of fine quartz 0.005 mm to less than 0.001 mm in size.

The sandstone beds are similar, but composed of fragments 2.0 mm to 0.05 mm in size enclosed in a matrix similar to the siltstone. Siltstone also rarely occurs as subrounded to rounded fragments in these beds.

The limestone is composed of a recrystallized calcite mosaic of crystals 0.1 to 0.3 mm in size containing small siltstone lenses. With increasing siltstone content these beds grade into normal siltstone containing rare calcite fragments and lenses.

Secondary quartz occurs as veins and overgrowths on quartz fragments and pyrite is an accessory in all rock types.

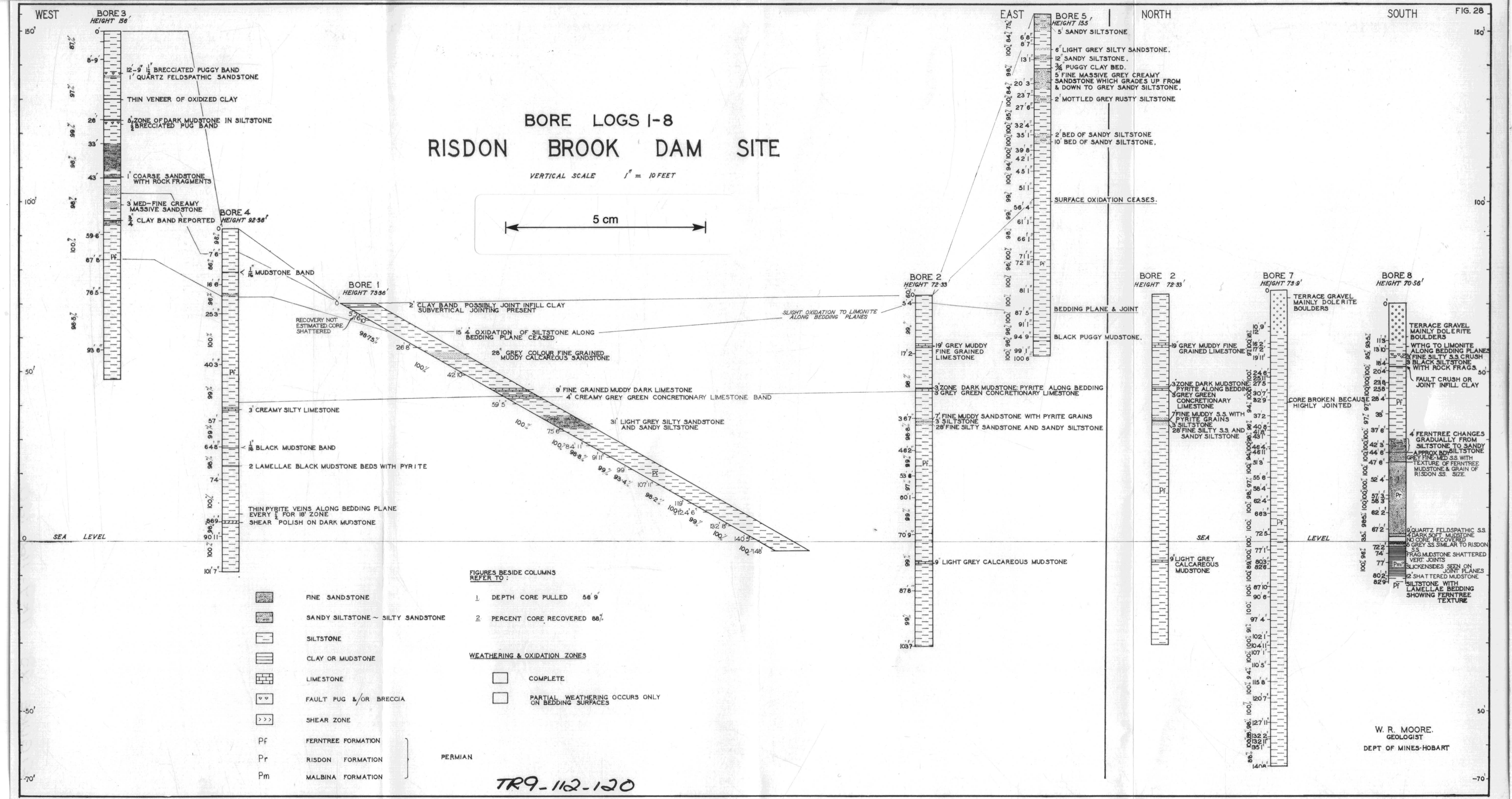

FIG. 28
WEST
EAST
NORTH
SOUTH
BORE LOGS 1-8
RISDON BROOK DAM SITE
VERTICAL SCALE 1" = 10 FEET
5 cm
BORE 3 HEIGHT 156'
12-9' 1 1/2" BRECCIATED PUGGY BAND
1' QUARTZ FELDSPATHIC SANDSTONE
THIN VENEER OF OXIDIZED CLAY
ZONE OF DARK MUDSTONE IN SILTSTONE
1/2" BRECCIATED PUG BAND
1' COARSE SANDSTONE WITH ROCK FRAGMENTS
3' MED-FINE CREAMY MASSIVE SANDSTONE
3/4" CLAY BAND REPORTED
BORE 4 HEIGHT 92·38'
1/16" MUDSTONE BAND
3' CREAMY SILTY LIMESTONE
1/16" BLACK MUDSTONE BAND
2 LAMELLAE BLACK MUDSTONE BEDS WITH PYRITE
THIN PYRITE VEINS ALONG BEDDING PLANE EVERY 1/2" FOR 18' ZONE
SHEAR POLISH ON DARK MUDSTONE
SEA LEVEL
BORE 1 HEIGHT 73·36'
RECOVERY NOT ESTIMATED CORE SHATTERED
2' CLAY BAND POSSIBLY JOINT INFILL CLAY SUBVERTICAL JOINTING PRESENT
15' 4" OXIDATION OF SILTSTONE ALONG BEDDING PLANE CEASED
28' GREY COLOUR FINE GRAINED MUDDY CALCAREOUS SANDSTONE
9' FINE GRAINED MUDDY DARK LIMESTONE
4' CREAMY GREY GREEN CONCRETIONARY LIMESTONE BAND
31' LIGHT GREY SILTY SANDSTONE AND SANDY SILTSTONE
BORE 2 HEIGHT 72·33'
SLIGHT OXIDATION TO LIMONITE ALONG BEDDING PLANES
19' GREY MUDDY FINE GRAINED LIMESTONE
3' ZONE DARK MUDSTONE; PYRITE ALONG BEDDING
3' GREY GREEN CONCRETIONARY LIMESTONE
7' FINE MUDDY SANDSTONE WITH PYRITE GRAINS
3' SILTSTONE
28' FINE SILTY SANDSTONE AND SANDY SILTSTONE
9' LIGHT GREY CALCAREOUS MUDSTONE
BORE 5 HEIGHT 155'
5' SANDY SILTSTONE
6' LIGHT GREY SILTY SANDSTONE.
12' SANDY SILTSTONE.
3/4" PUGGY CLAY BED.
5' FINE MASSIVE GREY CREAMY SANDSTONE WHICH GRADES UP FROM & DOWN TO GREY SANDY SILTSTONE.
2' MOTTLED GREY RUSTY SILTSTONE
2' BED OF SANDY SILTSTONE
10' BED OF SANDY SILTSTONE.
SURFACE OXIDATION CEASES.
BEDDING PLANE & JOINT
BLACK PUGGY MUDSTONE.
BORE 2 HEIGHT 72·33'
19' GREY MUDDY FINE GRAINED LIMESTONE
3' ZONE DARK MUDSTONE PYRITE ALONG BEDDING
3' GREY GREEN CONCRETIONARY LIMESTONE
7' FINE MUDDY S.S. WITH PYRITE GRAINS
3' SILTSTONE
28' FINE SILTY S.S. AND SANDY SILTSTONE
9' LIGHT GREY CALCAREOUS MUDSTONE
BORE 7 HEIGHT 73·9'
TERRACE GRAVEL MAINLY DOLERITE BOULDERS
CORE BROKEN BECAUSE HIGHLY JOINTED
BORE 8 HEIGHT 70·56'
TERRACE GRAVEL MAINLY DOLERITE BOULDERS
WTHG TO LIMONITE ALONG BEDDING PLANES
FINE SILTY S.S. CRUSH
BLACK SILTSTONE WITH ROCK FRAGS.
FAULT CRUSH OR JOINT INFILL CLAY
4' FERNTREE CHANGES GRADUALLY FROM SILTSTONE TO SANDY SILTSTONE
APPROX BDY
GREY FINE-MED S.S. WITH TEXTURE OF FERNTREE MUDSTONE & GRAIN OF RISDON SS. SIZE.
9' QUARTZ FELDSPATHIC S.S.
4' DARK SOFT MUDSTONE
NO CORE RECOVERED
GREY SS. SIMILAR TO RISDON SS.
FRAG. MUDSTONE SHATTERED VERT. JOINTS
SLICKENSIDES SEEN ON JOINT PLANES
SHATTERED MUDSTONE
SILTSTONE WITH LAMELLAE BEDDING SHOWING FERNTREE TEXTURE
FIGURES BESIDE COLUMNS REFER TO:
1 DEPTH CORE PULLED 58' 9"
2 PERCENT CORE RECOVERED 88%
FINE SANDSTONE
SANDY SILTSTONE ~ SILTY SANDSTONE
SILTSTONE
CLAY OR MUDSTONE
LIMESTONE
FAULT PUG &/OR BRECCIA
SHEAR ZONE
Pf FERNTREE FORMATION
Pr RISDON FORMATION
Pm MALBINA FORMATION
PERMIAN
WEATHERING & OXIDATION ZONES
COMPLETE
PARTIAL WEATHERING OCCURS ONLY ON BEDDING SURFACES
W. R. MOORE.
GEOLOGIST
DEPT OF MINES-HOBART
TR9-112-120

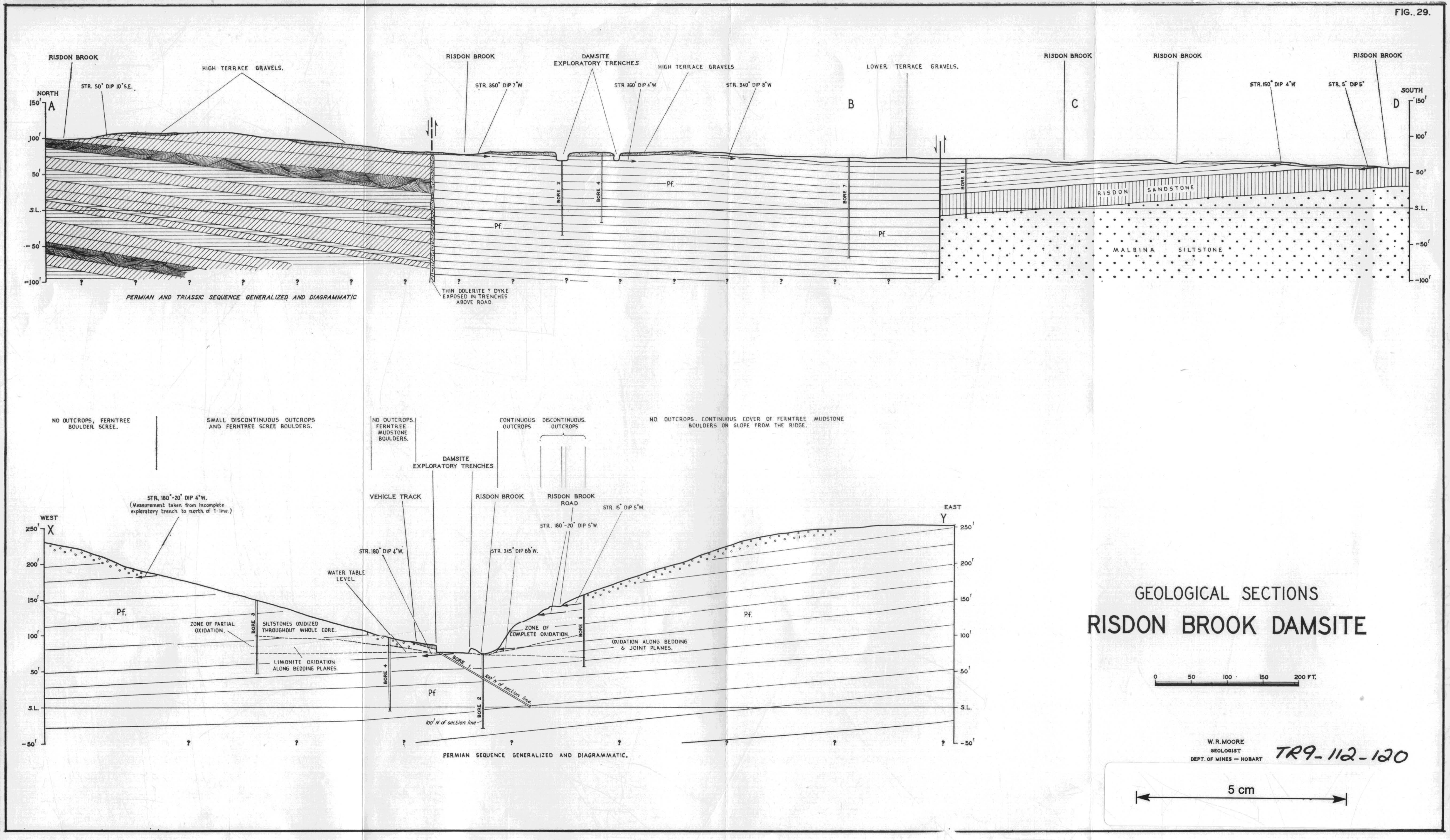
FIG. 29.
RISDON BROOK
HIGH TERRACE GRAVELS.
STR. 50° DIP 10° S.E.
NORTH
A
RISDON BROOK
STR. 350° DIP 7° W
DAMSITE EXPLORATORY TRENCHES
STR. 360° DIP 4° W
HIGH TERRACE GRAVELS
STR. 340° DIP 8° W
B
LOWER TERRACE GRAVELS.
RISDON BROOK
C
RISDON BROOK
STR. 150° DIP 4° W
STR. 5° DIP 5°
RISDON BROOK
SOUTH
D
BORE 2
BORE 4
Pf.
BORE 7
BORE 8
RISDON SANDSTONE
MALBINA SILTSTONE
S.L.
PERMIAN AND TRIASSIC SEQUENCE GENERALIZED AND DIAGRAMMATIC
THIN DOLERITE ? DYKE EXPOSED IN TRENCHES ABOVE ROAD.
NO OUTCROPS, FERNTREE BOULDER SCREE.
SMALL DISCONTINUOUS OUTCROPS AND FERNTREE SCREE BOULDERS.
NO OUTCROPS. FERNTREE MUDSTONE BOULDERS.
CONTINUOUS OUTCROPS
DISCONTINUOUS. OUTCROPS
NO OUTCROPS. CONTINUOUS COVER OF FERNTREE MUDSTONE BOULDERS ON SLOPE FROM THE RIDGE.
DAMSITE EXPLORATORY TRENCHES
VEHICLE TRACK
RISDON BROOK
RISDON BROOK ROAD
STR. 180°-20° DIP 4° W. (Measurement taken from incomplete exploratory trench to north of T-line.)
STR. 15° DIP 5° W.
STR. 180°-20° DIP 5° W.
STR. 180° DIP 4° W.
STR. 345° DIP 6½° W.
WATER TABLE LEVEL.
WEST
X
EAST
Y
ZONE OF PARTIAL OXIDATION.
SILTSTONES OXIDIZED THROUGHOUT WHOLE CORE.
LIMONITE OXIDATION ALONG BEDDING PLANES.
ZONE OF COMPLETE OXIDATION.
OXIDATION ALONG BEDDING & JOINT PLANES.
BORE 3
BORE 4
BORE 1
BORE 2
BORE 5
100' N of section line
PERMIAN SEQUENCE GENERALIZED AND DIAGRAMMATIC.
GEOLOGICAL SECTIONS
RISDON BROOK DAMSITE
0 50 100 150 200 FT.
W. R. MOORE
GEOLOGIST
DEPT. OF MINES — HOBART
TR9-112-120
5 cm

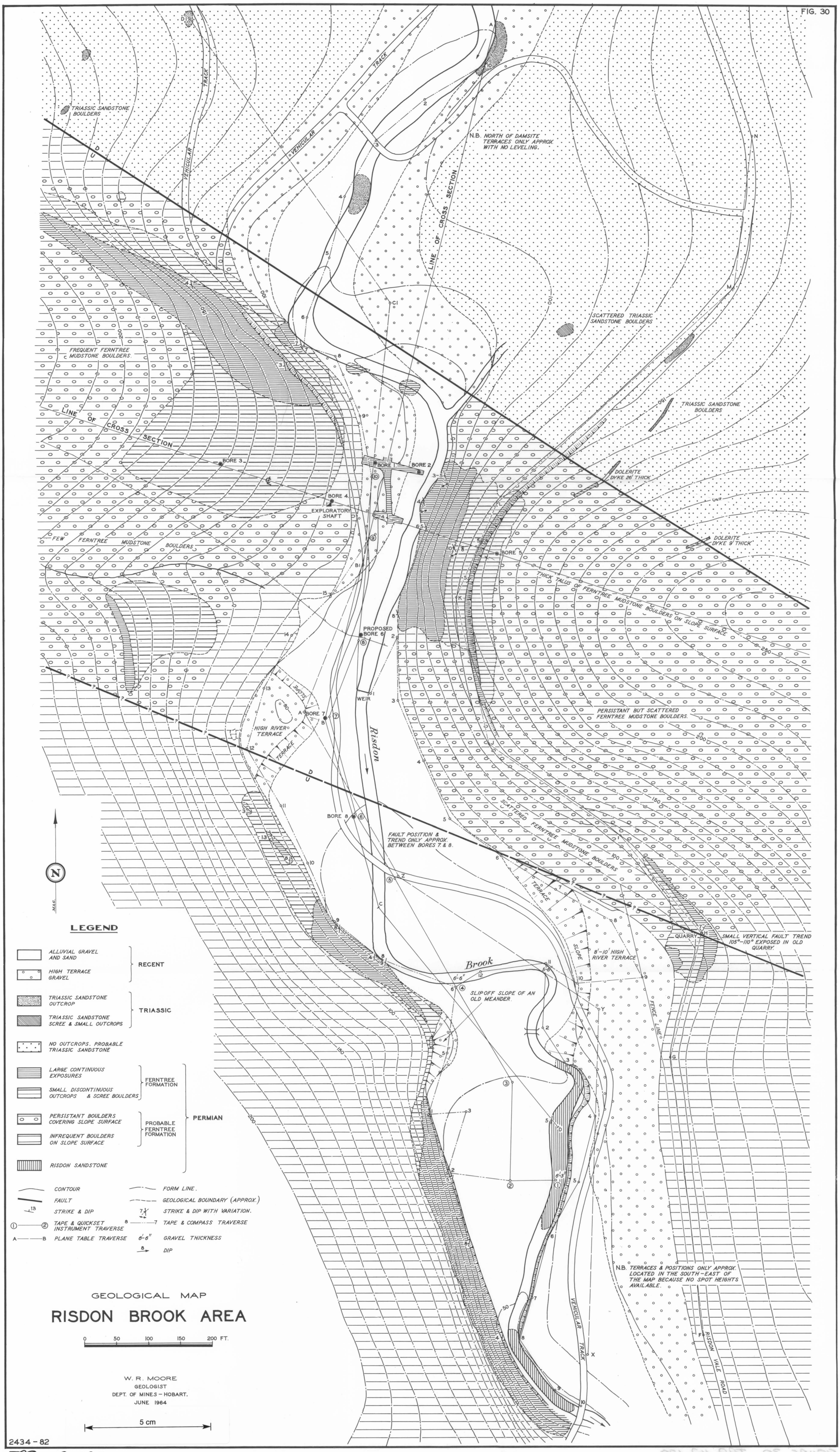
FIG. 30
TRIASSIC SANDSTONE BOULDERS
VEHICULAR TRACK
N.B. NORTH OF DAMSITE TERRACES ONLY APPROX. WITH NO LEVELING.
LINE OF CROSS SECTION
SCATTERED TRIASSIC SANDSTONE BOULDERS
FREQUENT FERNTREE MUDSTONE BOULDERS
TRIASSIC SANDSTONE BOULDERS
BORE 3
BORE 2
BORE 4
EXPLORATORY SHAFT
DOLERITE DYKE 26' THICK
DOLERITE DYKE 9' THICK
FEW FERNTREE MUDSTONE BOULDERS
BORE 5
THICK TALUS OF FERNTREE MUDSTONE BOULDERS ON SLOPE SURFACE
PROPOSED BORE 6
WEIR
PERSISTANT BUT SCATTERED FERNTREE MUDSTONE BOULDERS.
BORE 7
HIGH RIVER TERRACE
SLOPE
TERRACE
Risdon
BORE 8
FAULT POSITION & TREND ONLY APPROX. BETWEEN BORES 7 & 8.
SCATTERED FERNTREE MUDSTONE BOULDERS
TERRACE
QUARRY
SMALL VERTICAL FAULT TREND 105°–110° EXPOSED IN OLD QUARRY.
Brook
8'–10' HIGH RIVER TERRACE
SLOPE
SLIPOFF SLOPE OF AN OLD MEANDER.
FENCE LINE
VEHICULAR TRACK
N.B. TERRACES & POSITIONS ONLY APPROX. LOCATED IN THE SOUTH-EAST OF THE MAP BECAUSE NO SPOT HEIGHTS AVAILABLE.
RISDON VALE ROAD
LEGEND
ALLUVIAL GRAVEL AND SAND
HIGH TERRACE GRAVEL
RECENT
TRIASSIC SANDSTONE OUTCROP
TRIASSIC SANDSTONE SCREE & SMALL OUTCROPS
TRIASSIC
NO OUTCROPS. PROBABLE TRIASSIC SANDSTONE
LARGE CONTINUOUS EXPOSURES
SMALL DISCONTINUOUS OUTCROPS & SCREE BOULDERS
FERNTREE FORMATION
PERSISTANT BOULDERS COVERING SLOPE SURFACE
INFREQUENT BOULDERS ON SLOPE SURFACE
PROBABLE FERNTREE FORMATION
PERMIAN
RISDON SANDSTONE
CONTOUR
FAULT
STRIKE & DIP
TAPE & QUICKSET INSTRUMENT TRAVERSE
PLANE TABLE TRAVERSE
FORM LINE.
GEOLOGICAL BOUNDARY (APPROX.)
STRIKE & DIP WITH VARIATION.
TAPE & COMPASS TRAVERSE
GRAVEL THICKNESS
DIP
GEOLOGICAL MAP
RISDON BROOK AREA
0 50 100 150 200 FT.
W. R. MOORE
GEOLOGIST
DEPT. OF MINES – HOBART.
JUNE 1964
5 cm
2434 – 82

TR9-112-120