DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
ENGINEERING DIVISION

BAROSSA DAM

Sec. 1 Hd. Barossa

GEOLOGICAL INVESTIGATION

Client : Engineering and Water Supply Department

by

J. SELBY
SENIOR GEOLOGIST
ENGINEERING GEOLOGY SECTION

Rept.Bk.No. 73/271
G.S. No. 5274
Eng.Geol. No. 1973/5a
D.M. No. 414/73

14th November, 1973.

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SUMMARY AND CONCLUSIONS

Both abutments of the Barossa arch dam have been investigated to determine their stability by geological mapping, diamond drilling and water pressure testing.

Drilling has revealed massive strong quartzite with open rough joints. Water take was moderate with some local high values. No significant clay seams, crush zones or other areas of weakness were encountered.

A stereographic analysis of rock defects has been used to determine possible conditions of kinematic instability in the dam abutments. These are considered to be stable with very low probability of movement.

It is concluded that the dam wall cracks were caused by the 1954 earthquake which had a reported intensity of from 4 to 5 (Modified Mercalli Scale) in this area. The seismic wave front probably struck the left abutment first causing compression of the dam wall. The cracks have since been made more prominent by seepage and deposition of calcareous material.

INTRODUCTION

Geological investigations at the Barossa Dam have been carried out by request of the Engineer for Design, E. & W.S. Department. Narrow Cracks have appeared in the dam wall and the purpose of the work was to assess the stability of the abutments against the lateral thrust exerted by this arch dam.

The investigation consisted of a rock defect analysis based on the results of geological mapping, and diamond drilling with water testing of each abutment.

THE DAM

This was constructed in 1901 of concrete, reinforced in its upper levels by curved steel railway lines. The dam wall has a maximum height of 30 m and the linear distance between the abutments at crest level is 110 m. It has a radius of curvature of approximately 65 m.

Dimensions of the dam wall and the river valley are shown in Fig. 5. These were obtained from a survey carried out by the E. & W.S. Department.

Both vertical and horizontal cracks are visible on the downstream face of the dam wall (see Photo Appx. III). Cracks are covered by a calcareous encrustation derived from slow seepage through the wall concrete although there are no visible water seepages. The horizontal cracks have developed along "day planes" formed during pl cing of the dam wall concrete. Many of the vertical cracks are localised on the old handrail seatings on the crest of the dam (see Photo) and appear to penetrate the full thickness of the dam wall.

REGIONAL GEOLOGY

The reservoir is located on one of the uplifted fault blocks of the Mount Lofty Ranges (Fig. 1). The faulted boundaries of this block occur 4.5 km to the east of the reservoir (Kitchener Fault) and 10 km to the west (Para Fault).

It may be noted that the intermediate Eden Fault has died out at this point. The reservoir is situated on the Eastern limb of an anticline whose axis runs southwards to Adelaide.

SITE GEOLOGY

Bedrock in the area consists of medium to coarse Rhynie quartzite which is a strong, uniform generally fresh rock containing occasional bands of weaker siltstone (Fig. 2).

The quartzite dips to the east at from 40°-50° and is strongly jointed in two main directions. An analysis of the kinematic stability of both abutments is shown in Fig. 3. Here poles to 47 rock defect planes have been plotted on a stereographic projection. The main joint directions and wedge failure planes have been shown cyclographically together with the assumed thrust direction on each abutment.

DIAMOND DRILLING

Rock conditions in the abutments were investigated by two Diamond Drill holes, put down to a slope depth of 50 m with regular water pressure testing. Detailed logs are given in Appendix II and are summarised on the geological sections (Fig. 4). Photographs of the core appear in Appendix III.

The holes were drilled at an angle of 60° beneath each abutment, although comparison of the bedding seen in the drill core with that obtained from field data indicates a considerable drillhole declination towards the vertical.

Core recovered was mainly fresh strong quartzite. Frequent open (up to 5 mm) joints caused appreciable water take with an average of 3 to 5 lugeons (maximum 50 lugeons at 10 m in DH 2). Occasional bands of weaker siltstone, less than 1 m thick have caused significant core breakage but otherwise low fracture index values and 100% core recovery give a clear indication of the strength and uniformity of the rock mass. No major clay seams or crush zones were seen.

GROUNDWATER

Several weeks after drilling, the groundwater levels in both holes had stabilised at from 7 to 10 m below ground. This groundwater level is in continuity with the average reservoir

storage level (see Fig. 4) but is "perched" above the valley floor. No seepages occur through the sides of the valley and it may be concluded that either the sandstone rock mass is less permeable that the water pressure test results suggest or that the permeability is strongly anisotropic.

STABILITY OF ABUTMENTS

Failure of arch dam abutments may be attributed to three main causes:-

Slab sliding

Wedge failure

Compressional failure

These will now be discussed in greater detail:-

1. Slab sliding along rock defects can take place when the thrust direction is:-

   ...(1) normal to the strike and the dip angle is low.

   ...(2) along the strike and the strike "daylights" out of the abutment.

Both these conditions exist to some degree at the Barossa site. The right abutment thrust coincides with case (1), and the left abutment with case (2). The defect in both cases being the bedding.

However, due to the considerable mass of the abutments and the high frictional values along defect planes this type of failure is considered highly unlikely on this dam site.

2. Wedge Failure may occur when the thrust direction coincides with the trend of a major wedge failure direction with a low angle of plunge. Both abutment thrusts at the Barossa site approximately coincide with major wedge failure directions but all have comparitively steep plunges (minimum 42^{o}). Wedge failure is not considered to be a realistic mode of abutment

failure on this site.

3. Compressional failure is usually caused by the presence of clay seams or compressible fault zones. No major clay seams were seen in the core and field mapping revealed no local fault zones of any description. It is concluded that failure by compression is an extremely remote possibility on this site.

ORIGIN OF DAM WALL CRACKS

The cracks were apparently first noticed after the 1954 earthquake when a shock was experienced in this area of intensity 4 to 5 on the Modified Mercalli Shale. At this time several springs were formed on the right hand downstream bank of the gorge but these all dried up within a year. No other local effects were noticed in the reservoir area.

The epicentre of the 1954 earthquake was located along the Eden Fault in the Darlington area, about 45 km south west of the Dam site. Its duration was about 10 seconds. Advancing Body Waves would have struck the left abutment of the dam site first causing a compressional movement in the dam wall. Vertical tension cracks could have been formed in the upstream wall of the dam and "day planes" could have been opened. These have since been enlarged by solution through the dam wall and made more prominent by deposition of calcareous material derived from the dam wall concrete.

This same seepage could have also caused deterioration in strength by rusting of the railway line reinforcing bars, originally installed in the upper section of the dam wall.

JS:JS
14th November, 1973.

J. SELBY
SENIOR GEOLOGIST
ENGINEERING GEOLOGY SECTION

REFERENCES

Kerr-Grant, C., 1955. The Adelaide Earthquake of 1st March, 1954. Trans. Roy. Soc. of S.A.

Krynine, D.P. and Judd, W.R., 1957. Principles of Engineering Geology and Geotechnics. Pub. John Wiley.

APPENDIX I

Cost of Drilling

Cost of drilling

	$
WAGES/Bonus	845
ON COST	653
GENERAL/WORKSHOP	272
PLANT RENTAL	1358
TRANSPORT	109
DIAMOND BITS	807
Total	$4044

COST PER METRE DRILLED = $\frac{4044}{100}$

= $40.44

(N.B. This includes water pressure testing)

APPENDIX II

Drillhole Logs and Water Pressure Test Results

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH 1
SERIAL No. 607/74

PROJECT. BAROSSA DAM
FEATURE. FOUNDATION
LOCATION. BAROSSA VALLEY
SECTION 7 . . HUNDRED OF BAROSSA
COORDINATES
ANGLE FROM HORIZ. 60° DIRECTION 225°
E. L. Surface 256-8 . m
E. L. Collar — . m
Datum . A.H.D.

DESCRIPTION OF CORE (2)	GRAPHIC LOG	(1) CORE STRENGTH SIZE TERM DEPTH m	LOG	(3) FRACTURE LOG 2 10 50 200	STRUCTURES JOINTS, VEINS, SEAMS, SHEARED ZONES, CRUSHED ZONES	CORE LOSS %	WATER LEVEL DATE	CASING	DRILL WATER LOSS %	(4) WATER PRESSURE TESTS LUGEONS

PROTEROZOIC SANDSTONE FORMATION

TOPSOIL AND FILL

SANDSTONE, fine laminated, yellow and ironstained

Feldspar weathered to white kaolin
Calcrete in joints

SANDSTONE is coarser after 6.4m and fabric shows brown pitting along bedding

slight pitting due to weathering

SANDSTONE becomes fine to medium grained After 12.5m

rock fabric is slightly pitted due to weathering

SILTSTONE, grey, shaly

NO CORE

BROKEN — Seams of yellow SILT SOIL (ML) to 300mm decomposed SILTSTONE

BROKEN — Calcreted joint dipping 70°

Brown highly weathered zone

Friable decomposed zone

Joints dip at 50°

Bedding dips 45°

Bedding dips 30°

Joints, sandy and ironstained

Vertical joint

Clean fractures due to drilling process

Bedding dips 35°

Open crossjoints, ironstained

BROKEN — Clean fractures due to drilling

JOINTS, rough, planar ironstained

JOINTS, rough, irregular, silty

17th July '73

(115) (208) (267) (362) (388) (414)

① ROCK SUBSTANCE
STRENGTH TERM
VS–Very Strong
S–Strong
MS–Medium Strong
W–Weak
VW–Very Weak
SO–Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
50 10 2 0·5 length of core in cms.
2 10 50 200 Natural fractures per metre of core
50 10 2 0·5 Equivalent length of core in cm

④ (350) Maximum effective pressure (Kilopascals) reached during test.
Min. = Minimum value.

ENGINEERING GEOLOGY SECTION

DRILL No
TYPE Mindrill
DRILLER J. JENSEN
START 5 July 1973
FINISH 12 July 1973
LOGGED J.S.
DATE 20 Sep 73
TRACED G.M.
CHECKED

SHEET 1 OF 3 . DRG. No. S 10526 Ha 3.

P.F. No. S5027E MB

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH 1
SERIAL No. 601/74

PROJECT BAROSSA DAM
FEATURE. Foundation
LOCATION Barossa Valley
SECTION 7 HUNDRED Barossa
CO-ORDINATES
ANGLE FROM HORIZ. 60° DIRECTION 225°
E.L Surface 256·8 m
E.L Collar m
Datum AHD

DESCRIPTION OF CORE ②	GROUP SYMBOL	① STRENGTH TERM	CORE SIZE	CORE DEPTH m	LOG	③ FRACTURE LOG 2 10 50 200	STRUCTURES JOINTS, ZONES, SEAMS, SHEARED ZONES, CRUSHED ZONES	LIFT CORE LOSS	CASING	DRILL WATER LOSS %	WATER PRESSURE TEST ④
SANDSTONE, grey fine to medium grained Faint heavy mineral banding to 1mm SANDSTONE is uniform	PROTEROZOIC - RHYNIE SANDSTONE FORMATION			20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40		Bedding dips at 30° Clean fractures due to drilling process Jointing regular dipping 40°-60° Bedding dips 35° Bedding dips 35°	JOINTS, rough planar, ironstained				(414) (474) (505) (672) (697) (720) (750)

① ROCK SUBSTANCE
STRENGTH TERM
VS-Very Strong
S-Strong
MS-Medium Strong
W-Weak
VW-Very Weak
SO-Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
2 10 50 200 Natural fractures per metre of core
50 10 2 0·5 Equivalent length of core in cm

④ (350) Maximum effective pressure (Kilopascals) reached during test.
Min. = Minimum value

50 10 2 0·5 length of core in cms

ENGINEERING GEOLOGY SECTION

DRILL No.
TYPE Mundrill
DRILLER J. JENSEN
START 5 July '73
FINISH 12 July '73
LOGGED J. Selby
DATE 20 Sep '73
TRACED G.M.
CHECKED
SHEET 2 OF 3
DRG. No. S10526 & Ha 3

P.F. No. S5027E MB

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH 1
SERIAL No 601/74

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
SECTION 1 HUNDRED Barossa
CO-ORDINATES
ANGLE FROM HORIZ 60° DIRECTION 225°
E.L. Surface 256.8 m
E.L. Collar / m
Datum AHD

DESCRIPTION OF CORE	GROUP SYMBOL	STRENGTH TERM	CORE SIZE	DEPTH m	FRACTURE LOG	STRUCTURES JOINTS, VEINS, SEAMS, SHEARED ZONES, CRUSHED ZONES	CORE RECOVERY %	WATER LEVEL DATE	CASING	DRILL WATER LOSS %	WATER PRESSURE TESTS LUGEON
PROTEROZOIC - RHYNIE SANDSTONE											
SANDSTONE, grey fine to medium Sandstone is uniform with faint heavy mineral laminae				40 41 42 43 44 45 46 47 48 49 50		Bedding dips 25° Jointing is regular dipping 40°–70° JOINTS rough, planar, clean					(761) (577) (773)
END OF BORE 50·0 m											

① ROCK SUBSTANCE
STRENGTH TERM
VS–Very Strong
S–Strong
MS–Medium Strong
W–Weak
VW–Very Weak
SO–Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
50 10 2 0·5 length of core in cms
2 10 50 200 Natural fractures per metre of core
④ 50 10 2 0·5 Equivalent length of core in cm
(350) Maximum effective pressure (Kilopascals) reached during test.
Min. Minimum value.

ENGINEERING GEOLOGY SECTION

DRILL No.
TYPE
DRILLER J. JENSEN
START 5 July '73
FINISH 12 July '73
LOGGED J. Selby
DATE 20th Sept
TRACED G.M
CHECKED

SHEET 3 OF 3 DRG. No. S10526b Ha3

P.F. No. S5027E MB

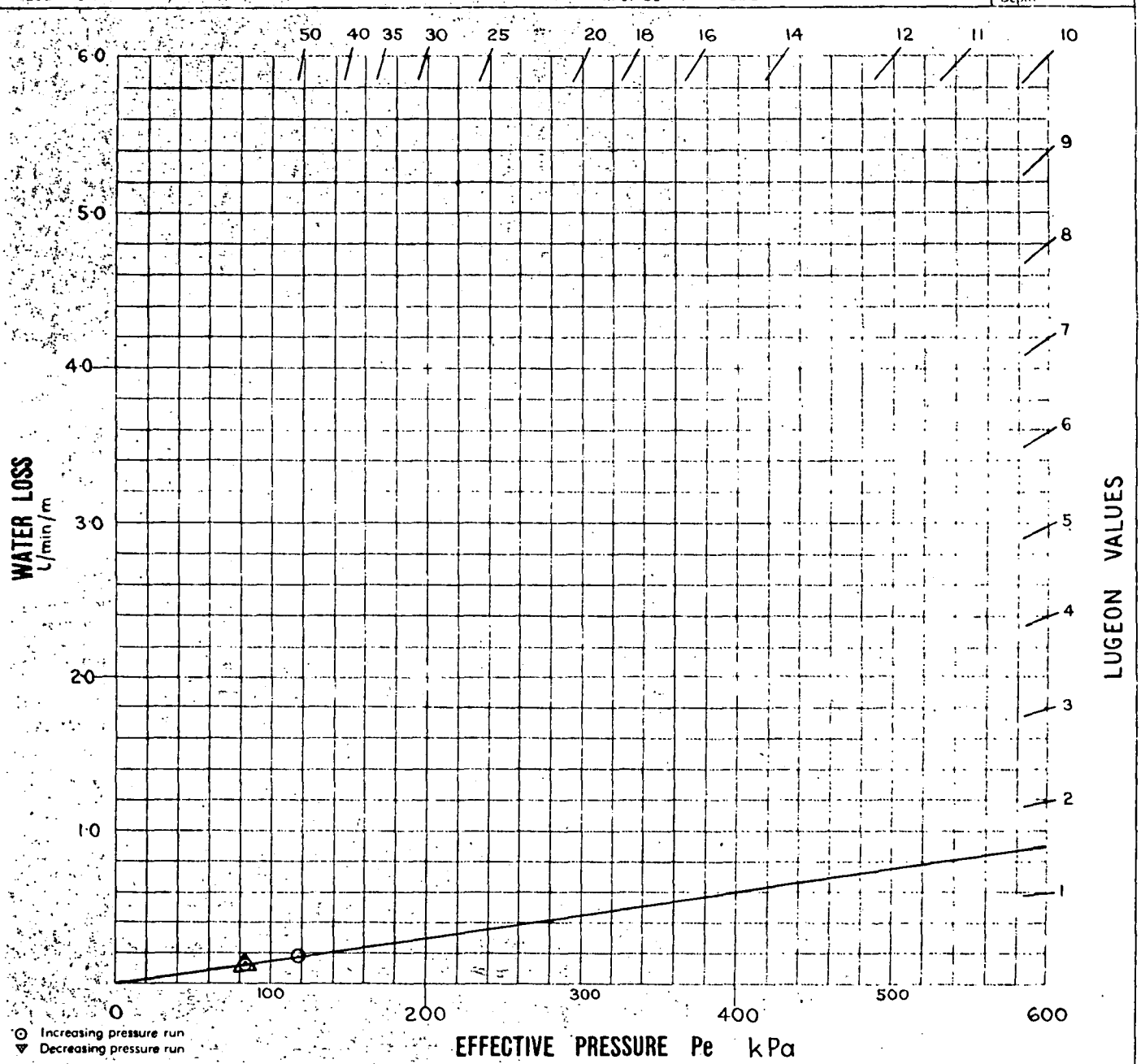
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH 1

SECTION TESTED
From 3·50 m
To 6·38 m
Mean Depth 4·94 m

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION
R.L. Collar metres Datum



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift Dry m

Length of test section 2·88 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 4·94 m
Below pressure gauge, Hw 5·44 m

Extra pressure due to head of water column, Pw 46·2 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
5	34·5	0·08	0·36	0·13	—	81
10	69·0	0·12	0·55	0·19	—	115
5	34·5	0·08	0·36	0·13	—	81

PACKER TYPE HYDRAULIC

Date of Test 6-7-73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No. S10528h

Pw = Hw sin θ x 9·81.
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No. S 10 006

Ps is obtained from Drg No.
* 100 kPa (kilopascal) = 1 bar

50 LUGEON PF S10020a MB IMPERIAL – METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

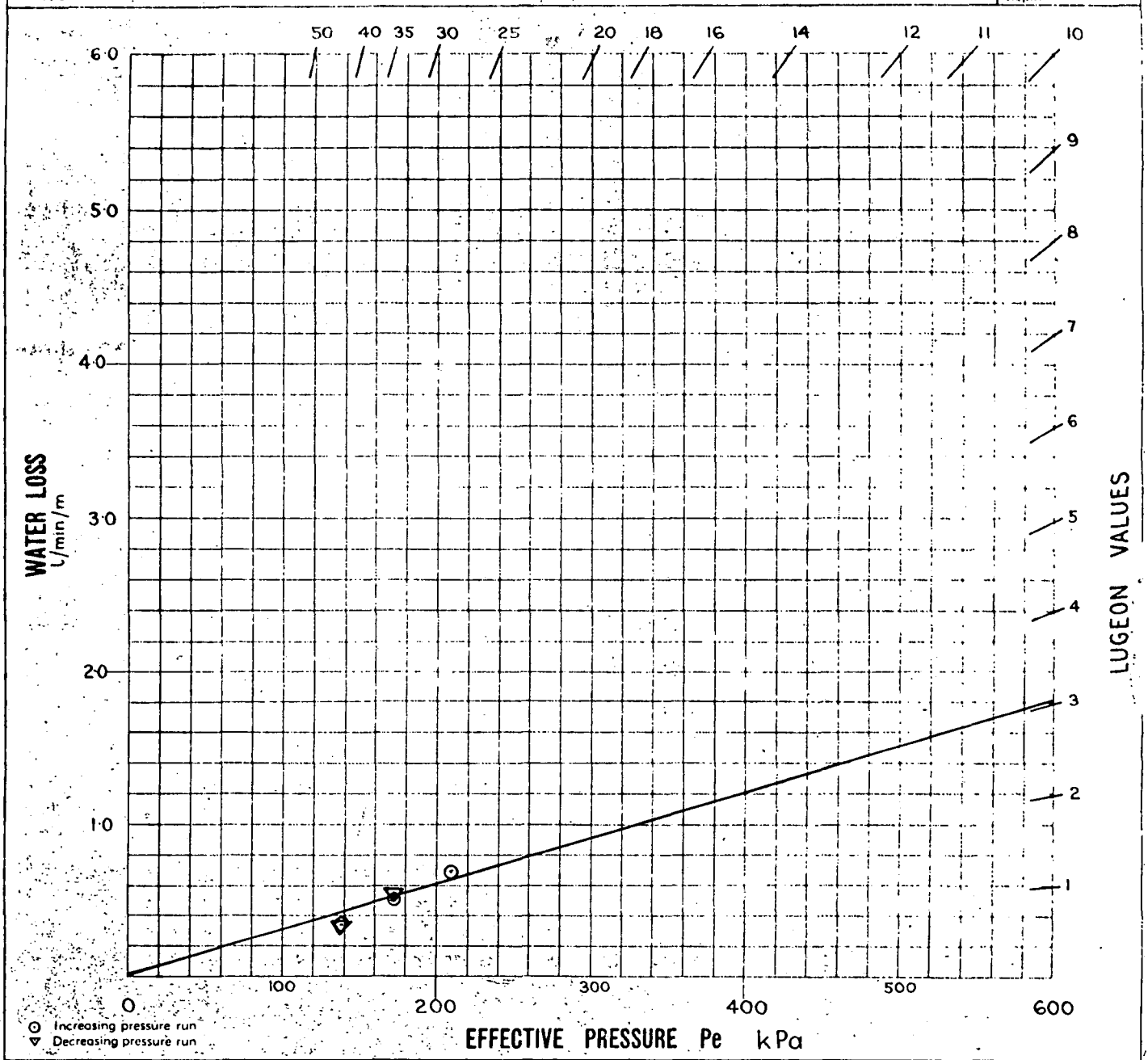
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE D.H1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY

CO ORDINATES:
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar ... metres Datum ...

SECTION TESTED
From 6·00 m
To 9·50 m
Mean Depth 7·75 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift Dry m

Length of test section .... 3·50 .... m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 7·75 m
Below pressure gauge, Hw 8·25 m

Extra pressure due to head of water column, Pw. 70·09 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
10	69·0	0·29	1·32	0·38	—	139
15	103·5	0·42	1·9	0·54	—	173·6
20	138·0	0·52	2·37	0·68	—	208
15	103·5	0·42	1·91	0·55	—	173·6
10	69·0	0·28	1·27	0·36	—	139

PACKER TYPE HYDRAULIC

Date of Test 6-7-73
Test by J. Jensen
Calc by B. Taylor
Checked ...
Drg No S10528i

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No. Ps is obtained from Drg No. S 10006
* 100 kPa (kilopascal) = 1 bar

Ha 3

50 LUGEON PF S10020a MB IMPERIAL – METRIC

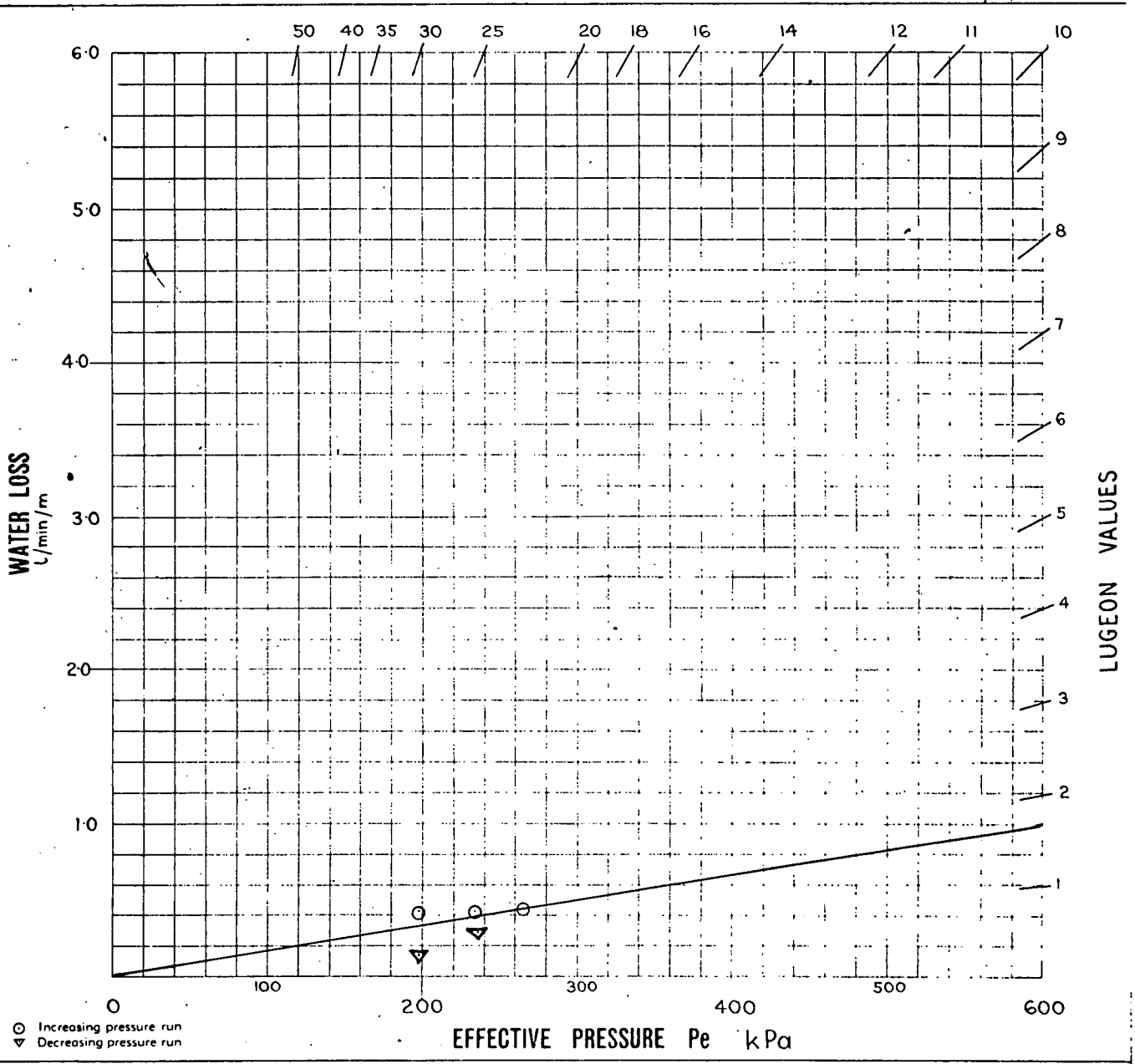
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225
R.L. Collar . . . . metres Datum . . . .

SECTION TESTED
From 9·10 m
To 12·26 m
Mean Depth 10·68 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·16 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 10·68 m
Below pressure gauge, Hw 11·18 m

Extra pressure due to head of water column, Pw 94·97 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
15	103·5	0·29	1·32	0·418	—	198·5
20	138·0	0·29	1·32	0·418	—	233
25	172·5	0·30	1·37	0·434	—	267
20	138·0	0·19	0·87	0·275	—	233
15	103·5	0·10	0·46	0·146	—	198·5

PACKER TYPE HYDRAULIC

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No.

Ps is obtained from Drg No 10 006 S
* 100 kPa (kilopascal) = 1 bar

Date of Test 9·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked
Drg No S10528j Hg3

50 LUGEON PF S10020a MB IMPERIAL – METRIC

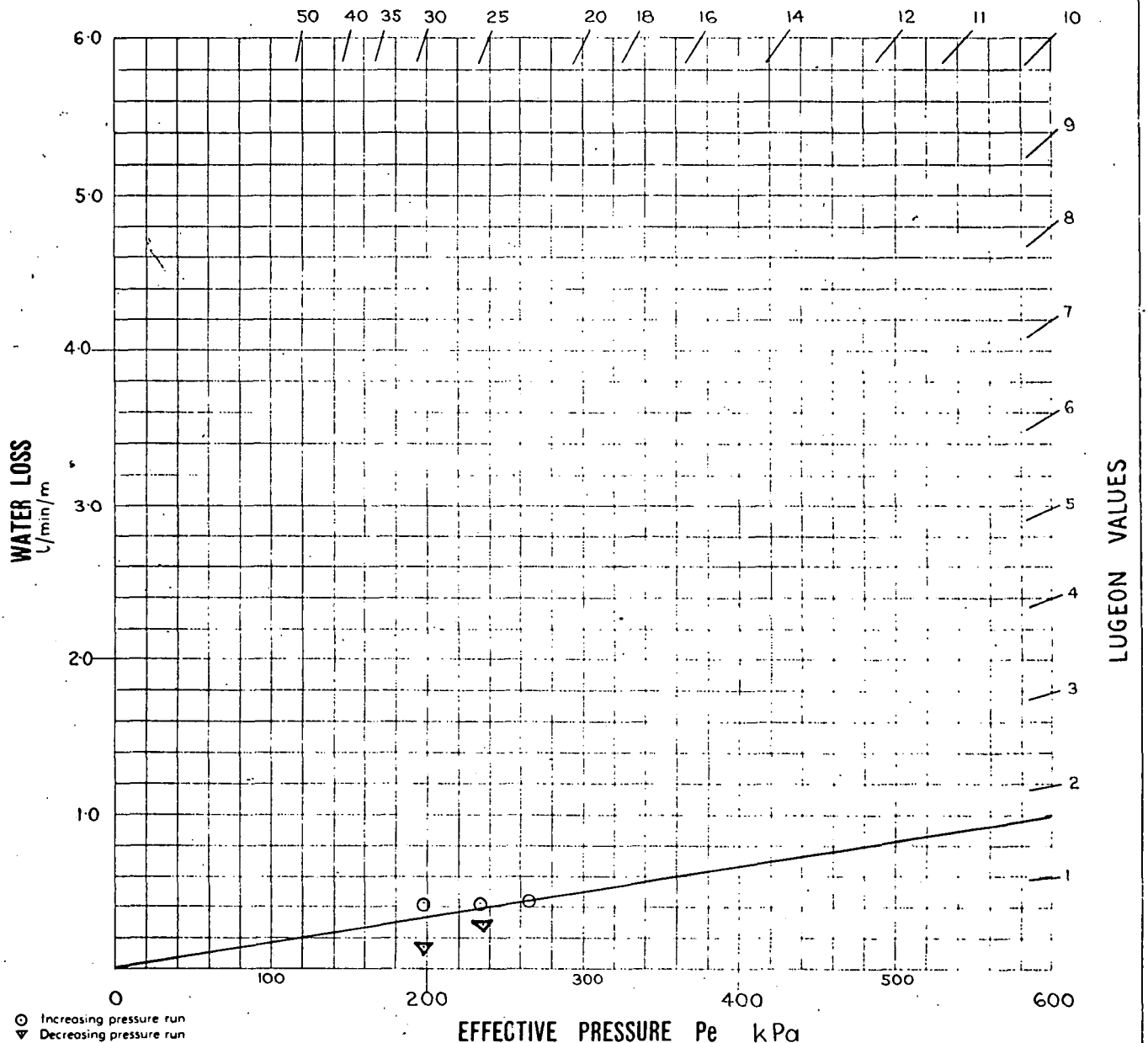
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225
R.L. Collar . . . metres Datum

SECTION TESTED
From 9·10 m
To 12·26 m
Mean Depth 10·68 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·16 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 10·68 m
Below pressure gauge, Hw 11·18 m

Extra pressure due to head of water column, Pw 94·97 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
15	103·5	0·29	1·32	0·418	—	198·5
20	138·0	0·29	1·32	0·418	—	233
25	172·5	0·30	1·37	0·434	—	267
20	138·0	0·19	0·87	0·275	—	233
15	103·5	0·10	0·46	0·146	—	198·5

PACKER TYPE HYDRAULIC

Date of Test 9·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10528j

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps.

For general layout of water pressure tests see Drg No. 5

Ps is obtained from Drg No 10 006.

* 100 kPa (kilopascal) = 1 bar

Ha3

50 LUGEON PF S10020a MB IMPERIAL – METRIC

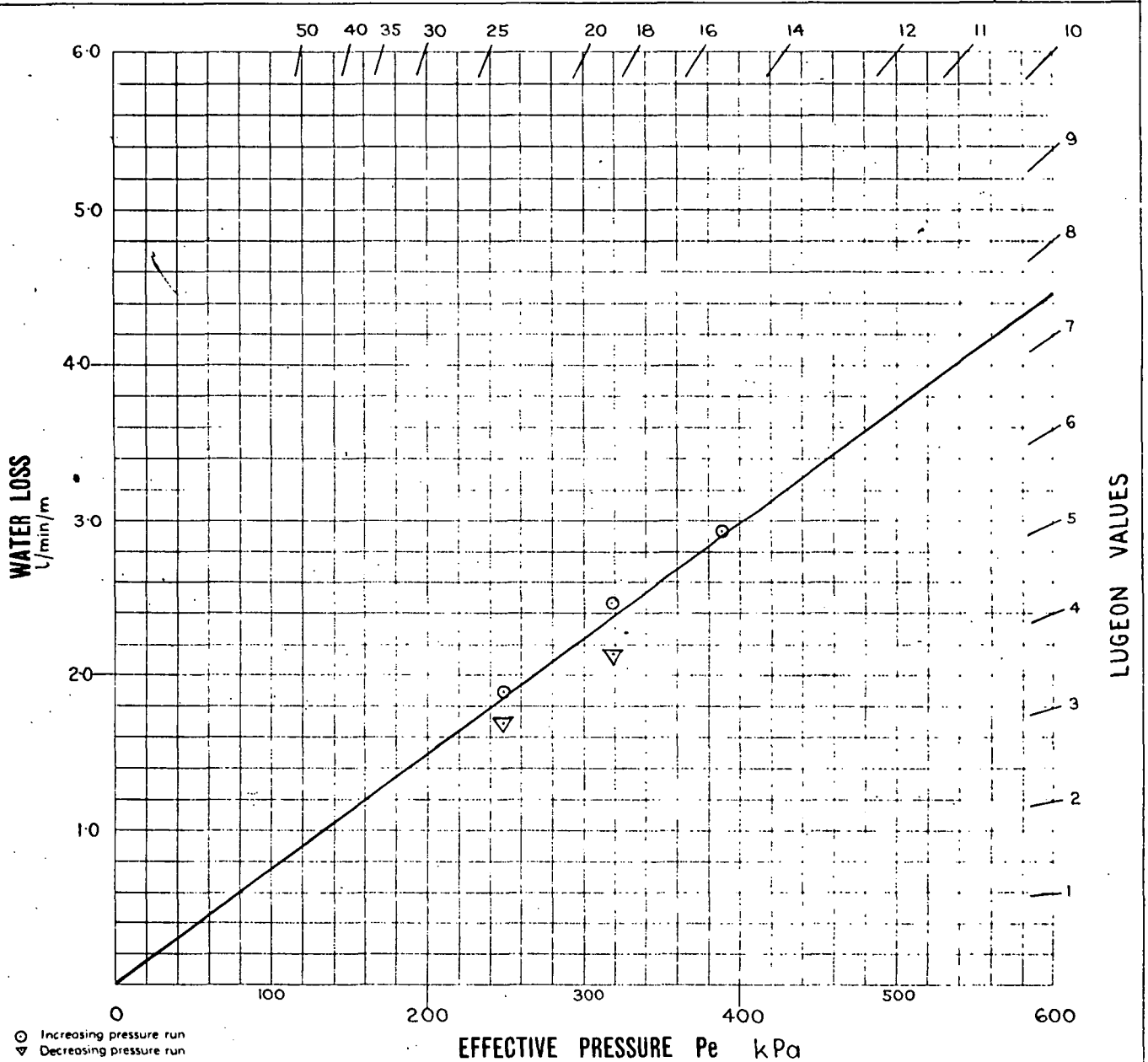
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 15·20 m
To 18·30 m
Mean Depth 16·75 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·10 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 16·75 m
Below pressure gauge, Hw 17·25 m

Extra pressure due to head of water column, Pw 146·5 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
15	103·5	1·31	5·96	1·92	—	250
25	172·5	1·68	7·64	2·47	—	319
35	241·5	2·00	9·1	2·94	—	388
25	172·5	1·46	6·64	2·14	—	319
15	103·5	1·15	5·23	1·69	—	250

PACKER TYPE HYDRAULIC

Date of Test 9·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10528 L

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No.

Ps is obtained from Drg No. S 10006
* 100 kPa (kilopascal) = 1 bar

50 LUGEON PF 510020a MB IMPERIAL – METRIC

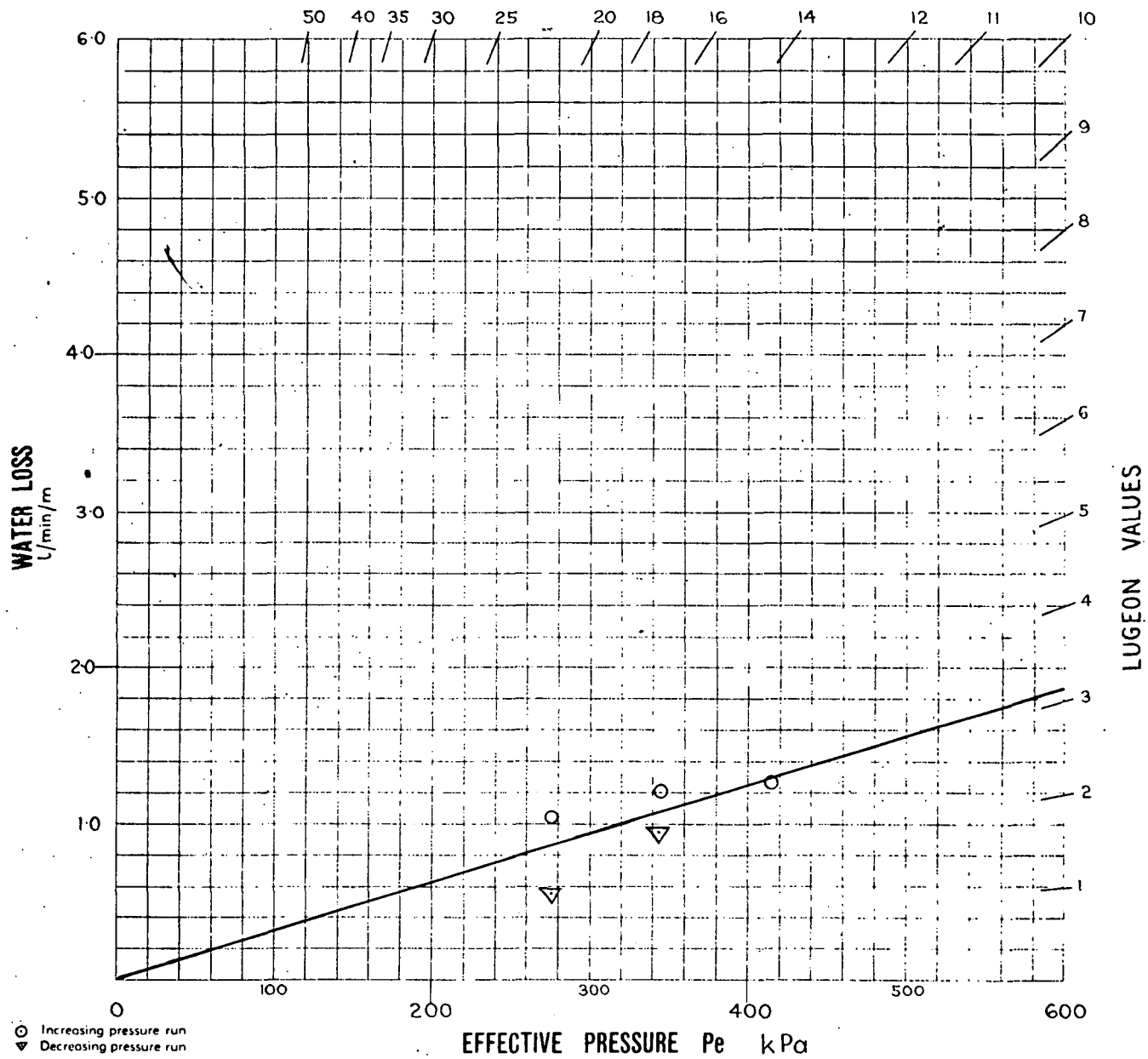
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 18·25 m
To 21·32 m
Mean Depth 19·79 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·07 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 19·79 m
Below pressure gauge, Hw 20·29 m
Extra pressure due to head of water column, Pw. 172·4 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
15	103·5	0·71	3·23	1·05	—	276
25	172·5	0·81	3·69	1·20	—	345
35	241·5	0·87	3·96	1·29	—	414
25	172·5	0·64	2·91	0·95	—	345
15	103·5	0·37	1·68	0·55	—	276

PACKER TYPE HYDRAULIC

Date of Test 10·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No.

Ps is obtained from Drg No. 10.006
* 100 kPa (kilopascal) = 1 bar

Drg No S10528 m
Hg 3

50 LUGEON PF S10020a MB IMPERIAL – METRIC

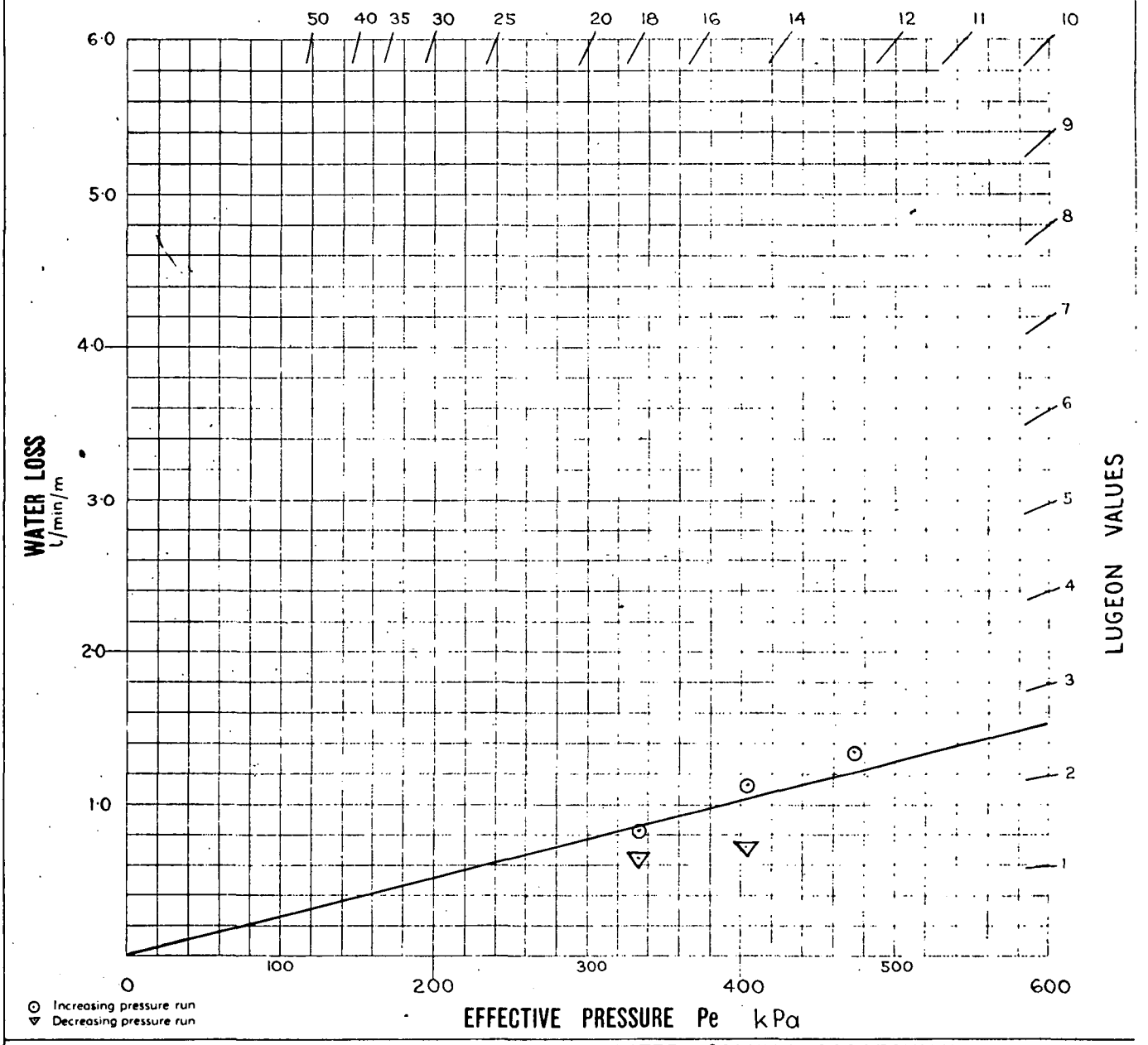
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 21·30 m
To 24·41 m
Mean Depth 22·85 m



Slope height of pressure gauge above collar 0·50 m
Groundwater level at beginning of shift DRY m
Length of test section 3·11 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 22·85 m
Below pressure gauge, Hw 23·35 m
Extra pressure due to head of water column, Pw 198·4 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138·0	0·56	2·55	0·82	—	336
30	207·0	0·77	3·50	1·13	—	405
40	276·0	0·93	4·23	1·36	—	474
30	207·0	0·49	2·23	0·72	—	405
20	138·0	0·43	1·96	0·63	—	336

PACKER TYPE HYDRAULIC

Date of Test 10·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10528n

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No.
Ps is obtained from Drg No 10.006
* 100 kPa (kilopascal) = 1 bar

50 LUGEON PF S10020a MB IMPERIAL – METRIC

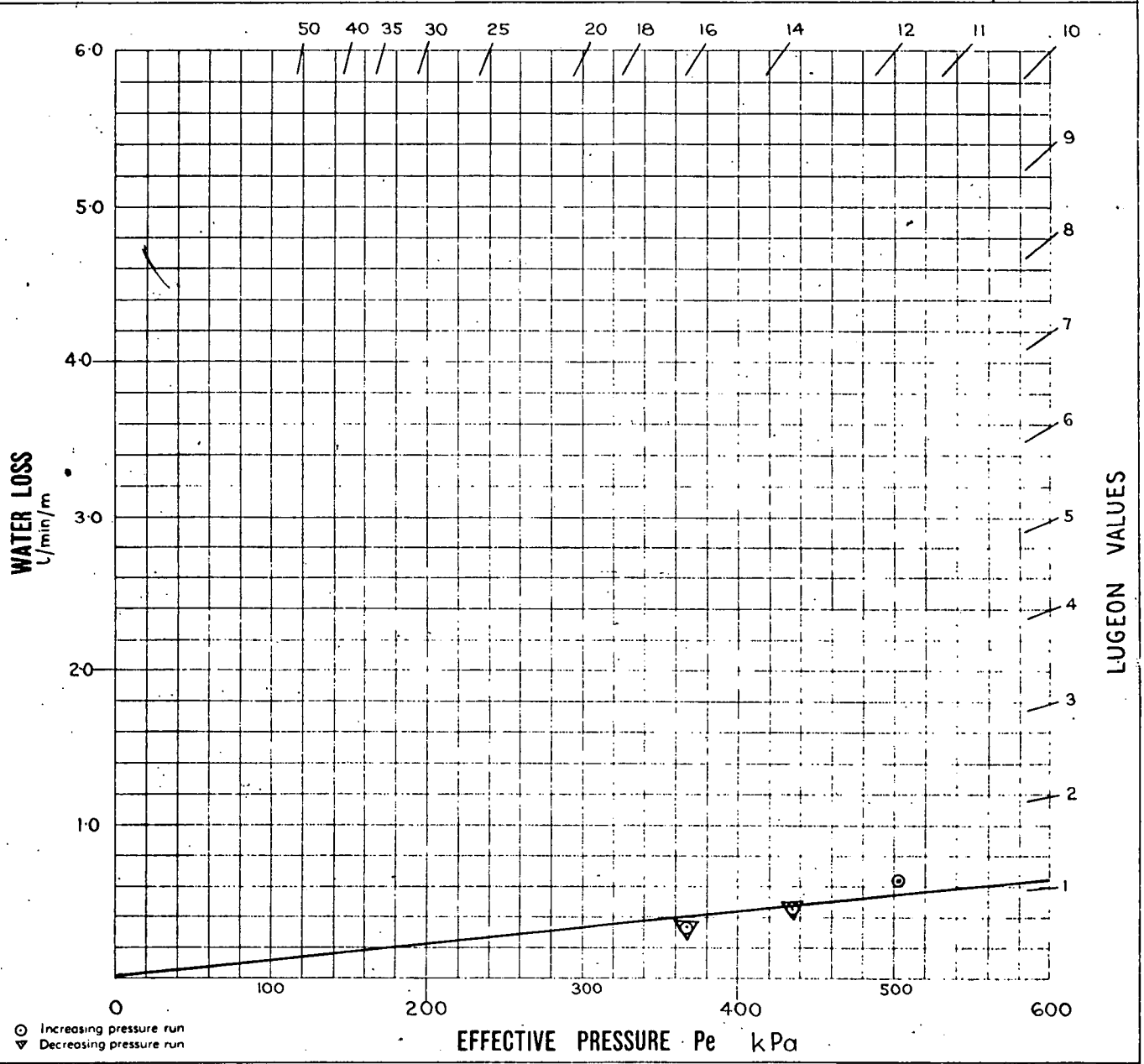
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 255°
R.L. Collar . . . metres Datum

SECTION TESTED
From 24·35 m
To 28·51 m
Mean Depth 26·43 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 4·16 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 26·43m
Below pressure gauge, Hw 26·93 m

Extra pressure due to head of water column, Pw 228·8 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa *	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·33	1·50	0·36		367
30	207	0·41	1·87	0·45		436
40	276	0·57	2·59	0·62		505
30	207	0·41	1·87	0·45		436
20	138	0·31	1·41	0·34		367

PACKER TYPE HYDRAULIC

Date of Test 11·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10528

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No.
Ps is obtained from Drg No 10 006
* 100 kPa (kilopascal) = 1 bar

50 LUGEON PF S10020a MB IMPERIAL – METRIC

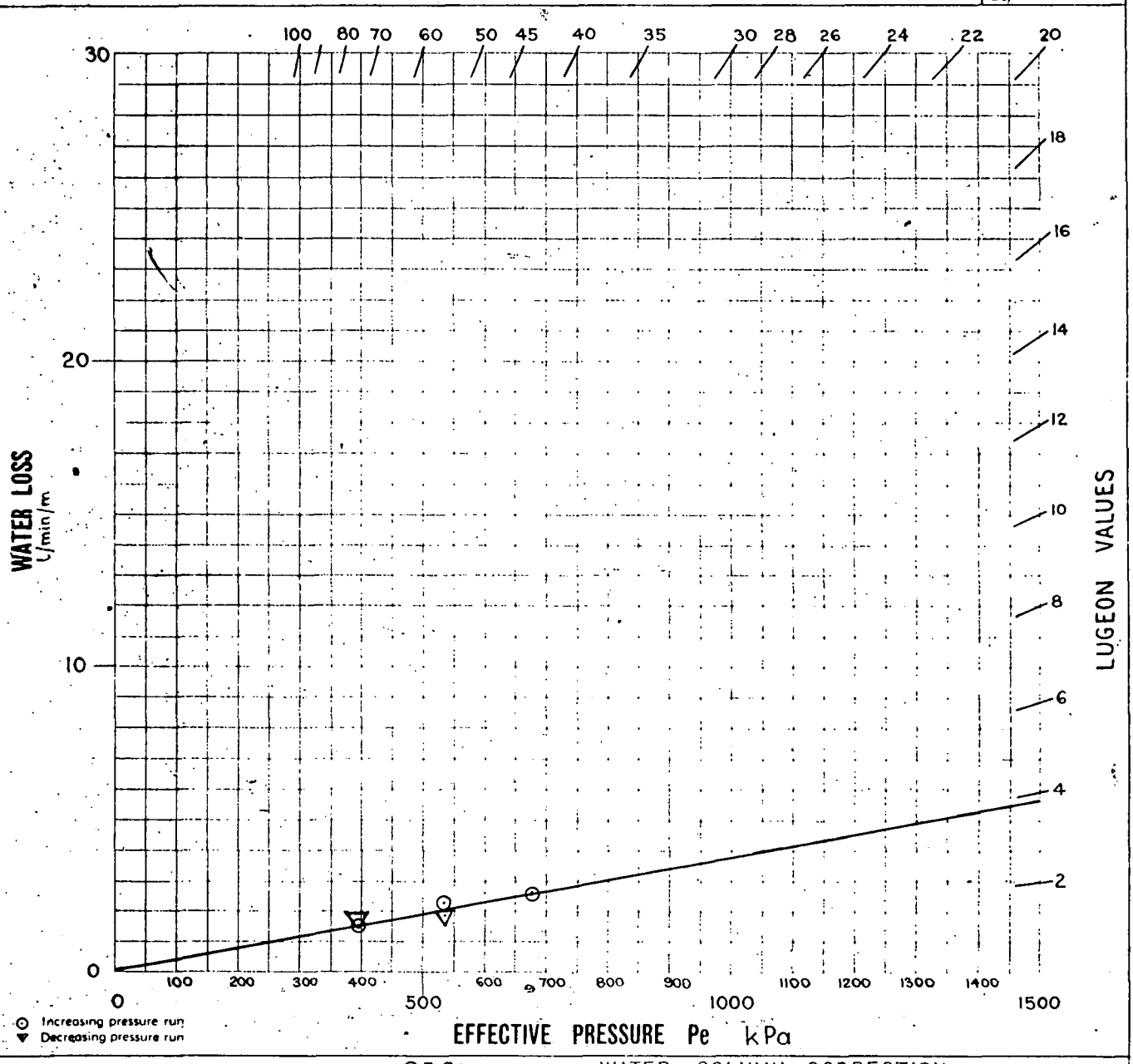
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·860) DIRECTION 255°
R.L. Collar . . . metres Datum

SECTION TESTED
From 28·30 m
To 31·53 m
Mean Depth 29·91 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·23 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 29·91 m
Below pressure gauge Hw 30·41 m

Extra pressure due to head of water column, Pw 258·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·33	1·502	0·465	—	396
40	276	0·48	2·18	0·67	—	534
60	414	0·59	2·68	0·83	—	672
40	276	0·43	1·957	0·606	—	534
20	138	0·37	1·68	0·52	—	396

PACKER TYPE HYDRAULIC

Date of Test 11·7·73
Test by J. Jensen.
Calc by B. Taylor.
Checked
Drg No S10528a

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure test - see Drg No S10010.006

Ps is obtained from Drg No Ha3

* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

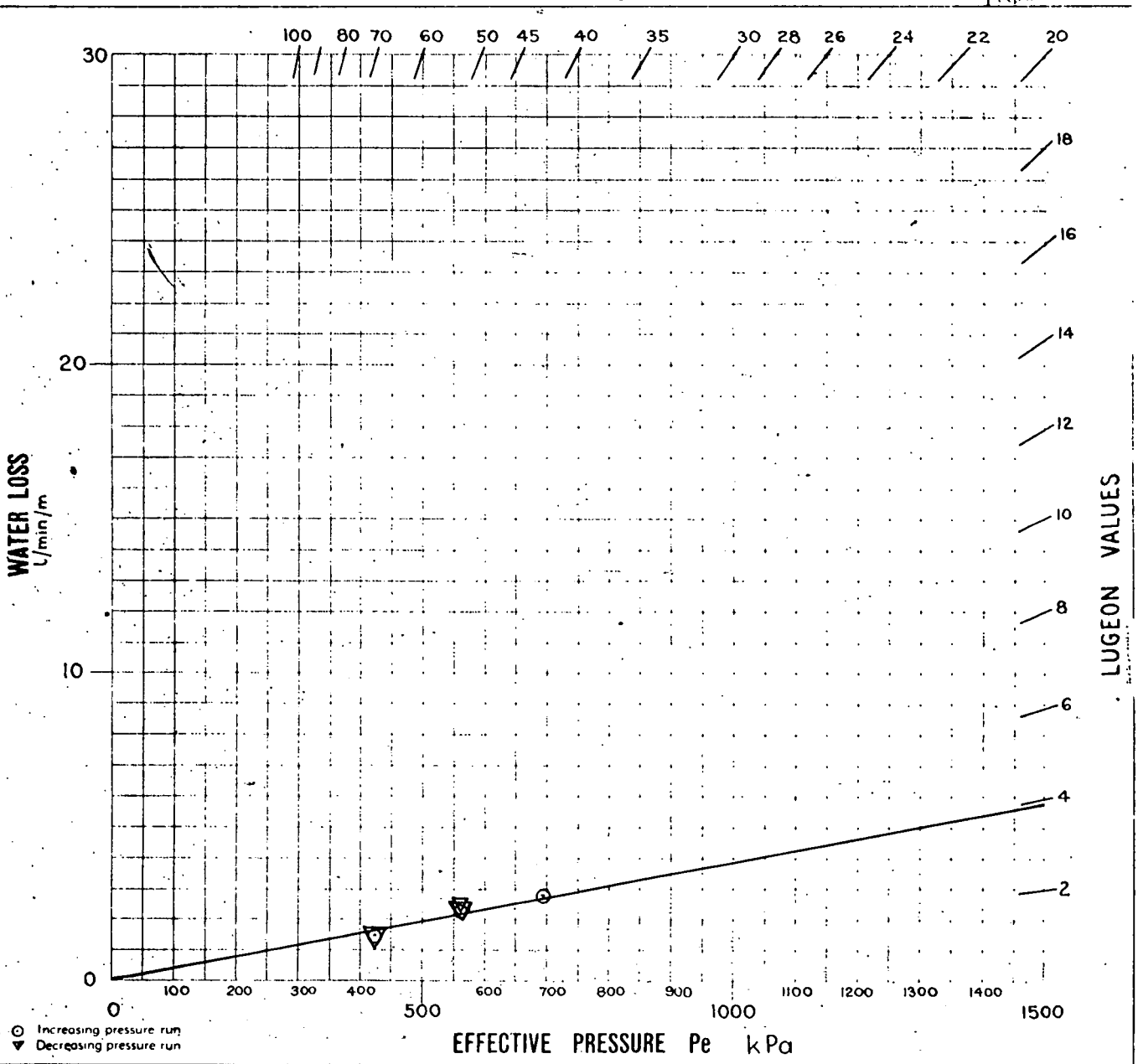
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 255°
R.L. Collar . . . metres Datum . .

SECTION TESTED
From 31·40 m
To 34·30 m
Mean Depth 32·85 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 2·90 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 32·85 m
Below pressure gauge Hw 33·35 m

Extra pressure due to head of water column, Pw 283·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·97	4·41	1·52	—	421
40	276	1·41	6·42	2·21	—	559
60	414	1·79	8·15	2·81	—	697
40	276	1·43	6·51	2·25	—	559
20	138	0·97	4·41	1·52	—	421

PACKER TYPE HYDRAULIC

Date of Test 11·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked
Drg No Ha3 S10528b

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No S

Ps is obtained from Drg No 10,006

* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

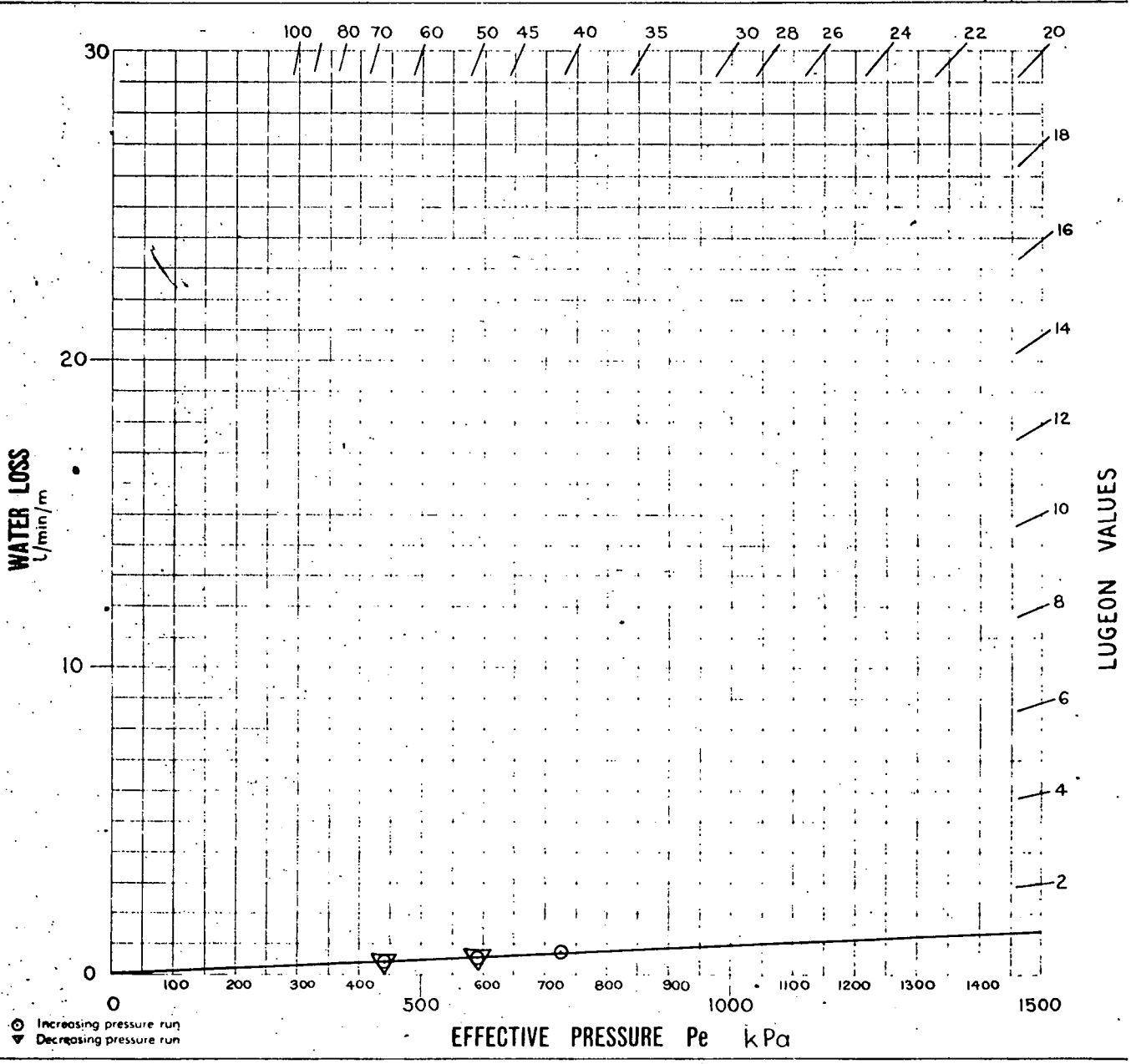
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 255°
R.L. Collar . . . metres Datum

SECTION TESTED
From 33·60 m
To 37·42 m
Mean Depth 35·51 m



Slope height of pressure gauge above collar 0·50 m
Groundwater level at beginning of shift DRY m
Length of test section 3·82 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 35·51 m
Below pressure gauge Hw 36·01 m
Extra pressure due to head of water column, Pw 305·9 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·41	1·87	0·49	—	444
40	276	0·53	2·41	0·63	—	582
60	414	0·65	2·96	0·78	—	720
40	276	0·53	2·41	0·63	—	582
20	138	0·41	1·87	0·49	—	444

PACKER TYPE HYDRAULIC

Date of Test 12·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg. No S10528c

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No
Ps is obtained from Drg No 10 006 S
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

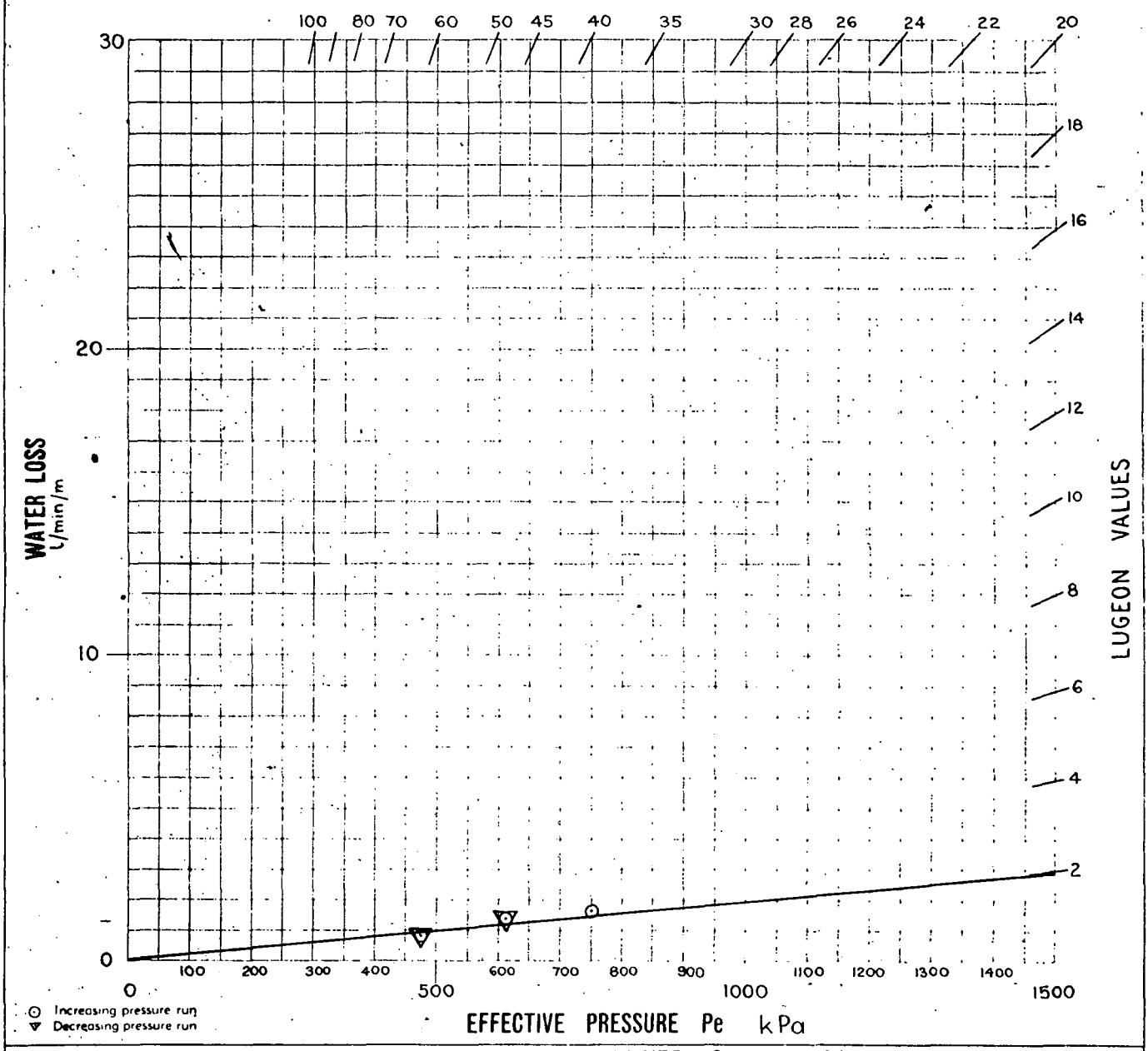
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 255°
R.L. Collar . . . metres Datum

SECTION TESTED
From 36·60 m
To 41·58 m
Mean Depth 39·09 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 4·98 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 39·09 m
Below pressure gauge Hw 39·59 m
Extra pressure due to head of water column, Pw 336·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·95	4·32	0·867	—	474
40	276	1·50	6·83	1·37	—	612
60	414	1·81	8·24	1·66	—	750
40	276	1·39	6·33	1·27	—	612
20	138	0·89	4·05	0·81	—	474

PACKER TYPE HYDRAULIC

Date of Test 12·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No. S10528 d

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure test see Drg No. S 10.006
Ps is obtained from Drg No
* 100 kPa (kilopascal) = 1 bar

100 LUGEON P.F S10020 MB IMPERIAL – METRIC

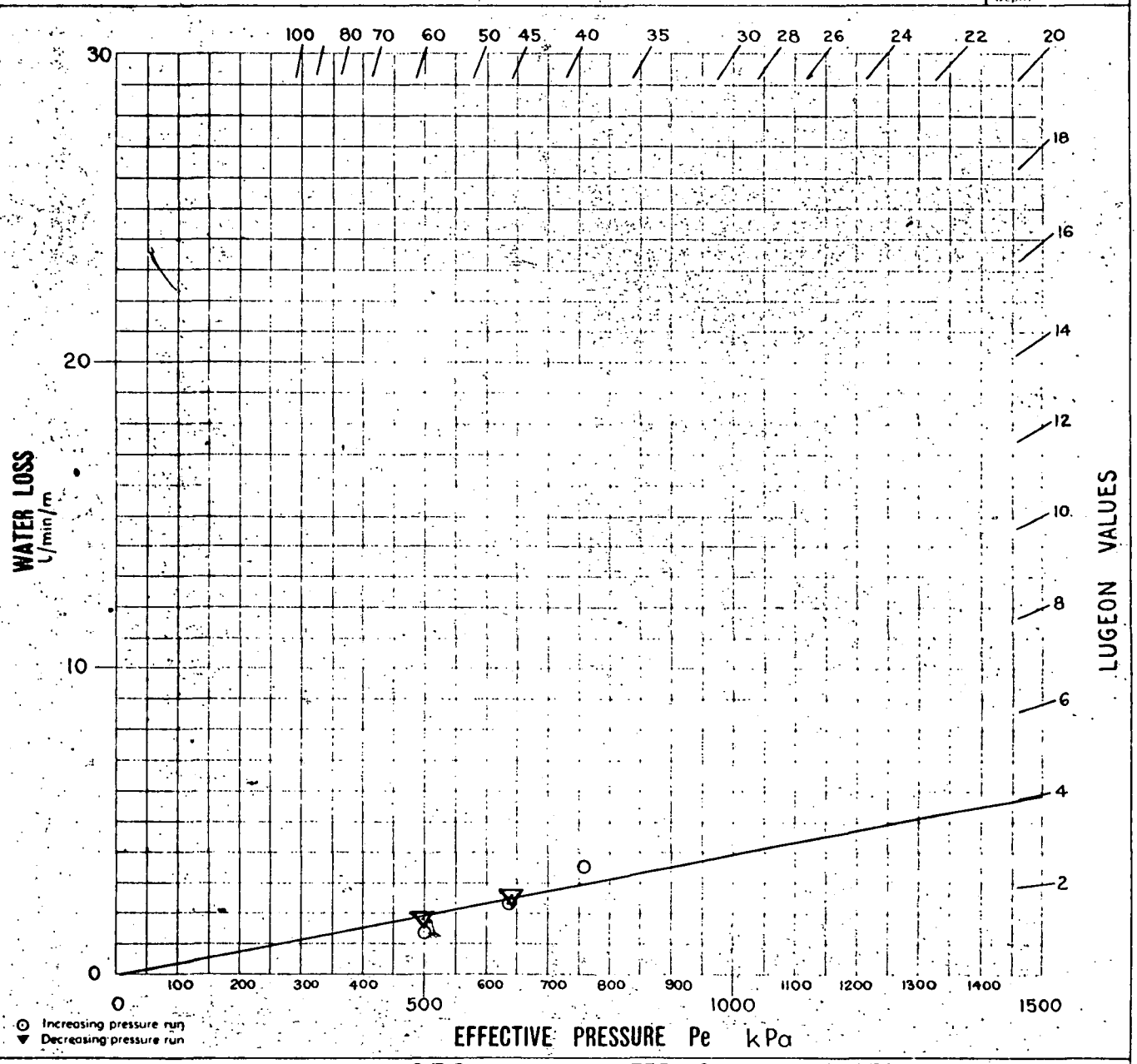
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
R.L. Collar. metres Datum
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 255°

SECTION TESTED
From 39·80 m
To 43·60 m
Mean Depth 41·70 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·80 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 41·70 m
Below pressure gauge Hw 42·20 m
Extra pressure due to head of water column, Pw 358·5 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	1·13	5·14	1·35	—	497
40	276	1·97	8·96	2·36	—	635
60	414	3·04	13·83	3·64	11·2	761
40	276	2·15	9·78	2·57	—	635
20	138	1·56	7·10	1·87	—	497

PACKER TYPE HYDRAULIC

Date of Test 13·7·73
Test by Jensen
Calc by B. Taylor
Checked
Drg No. S10528e

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No. S 10 006
Ps is obtained from Drg No Ha3
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

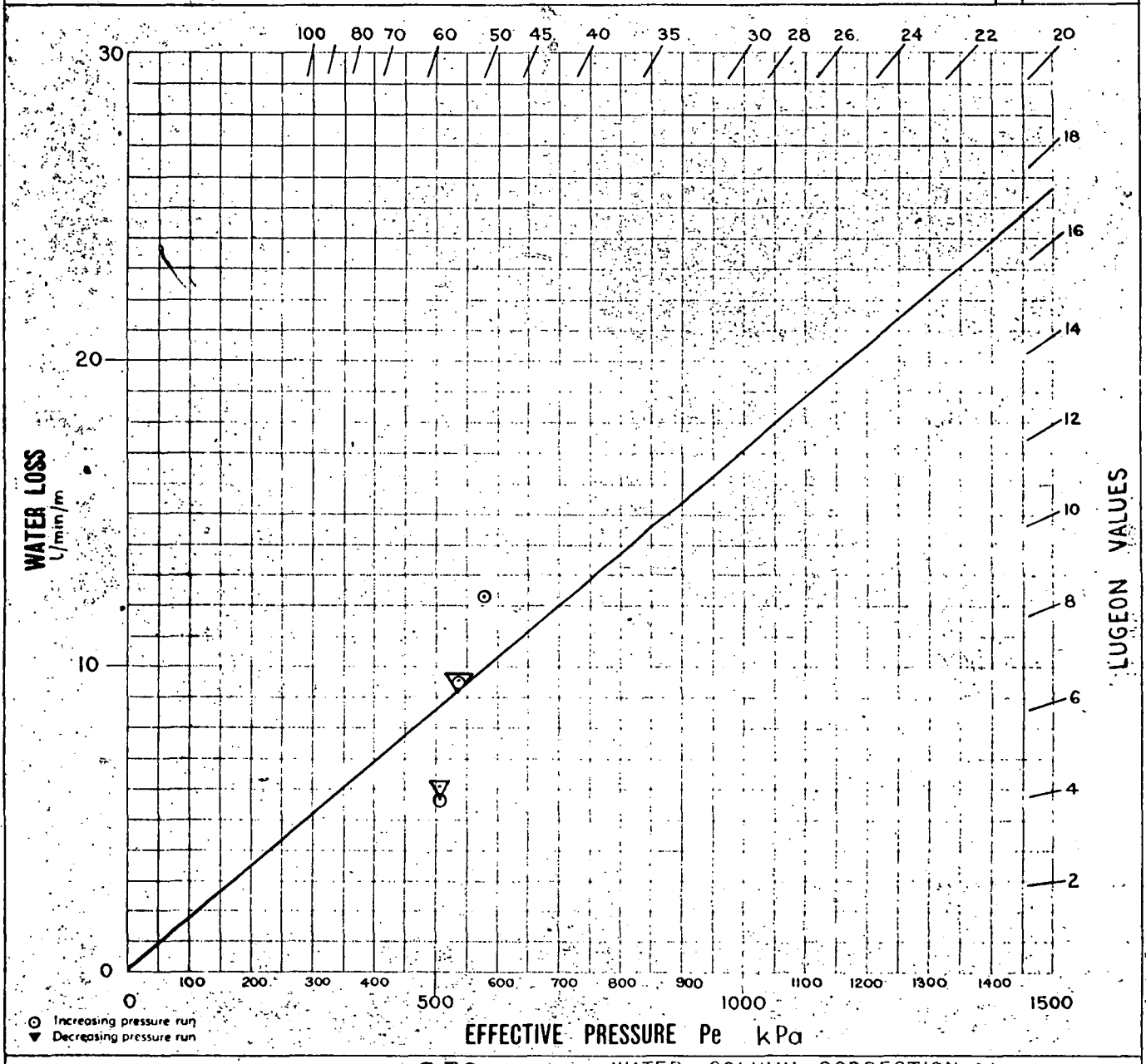
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine · 0·866) DIRECTION
R.L. Collar metres Datum

SECTION TESTED
From 43·30 m
To 46·78 m
Mean Depth 45·04 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·48 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 45·04 m
Below pressure gauge, Hw 45·54 m
Extra pressure due to head of water column, Pw 386·9 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	4·4	20·02	5·75	21·8	503
30	207	7·3	33·22	9·55	55	539
40	276	9·4	42·77	12·29	86	577
30	207	7·4	33·67	9·68	55	539
20	138	4·64	21·11	6·07	24·1	501

PACKER TYPE HYDRAULIC

Date of Test 13·7·73
Test by J.Jensen
Calc by B.Taylor
Checked
Drg No S10528f

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No. S10006

Ps is obtained from Drg No H83
* 100 kPa (kilopascal) = 1 bar

LUGEON PF S10020 MB IMPERIAL – METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

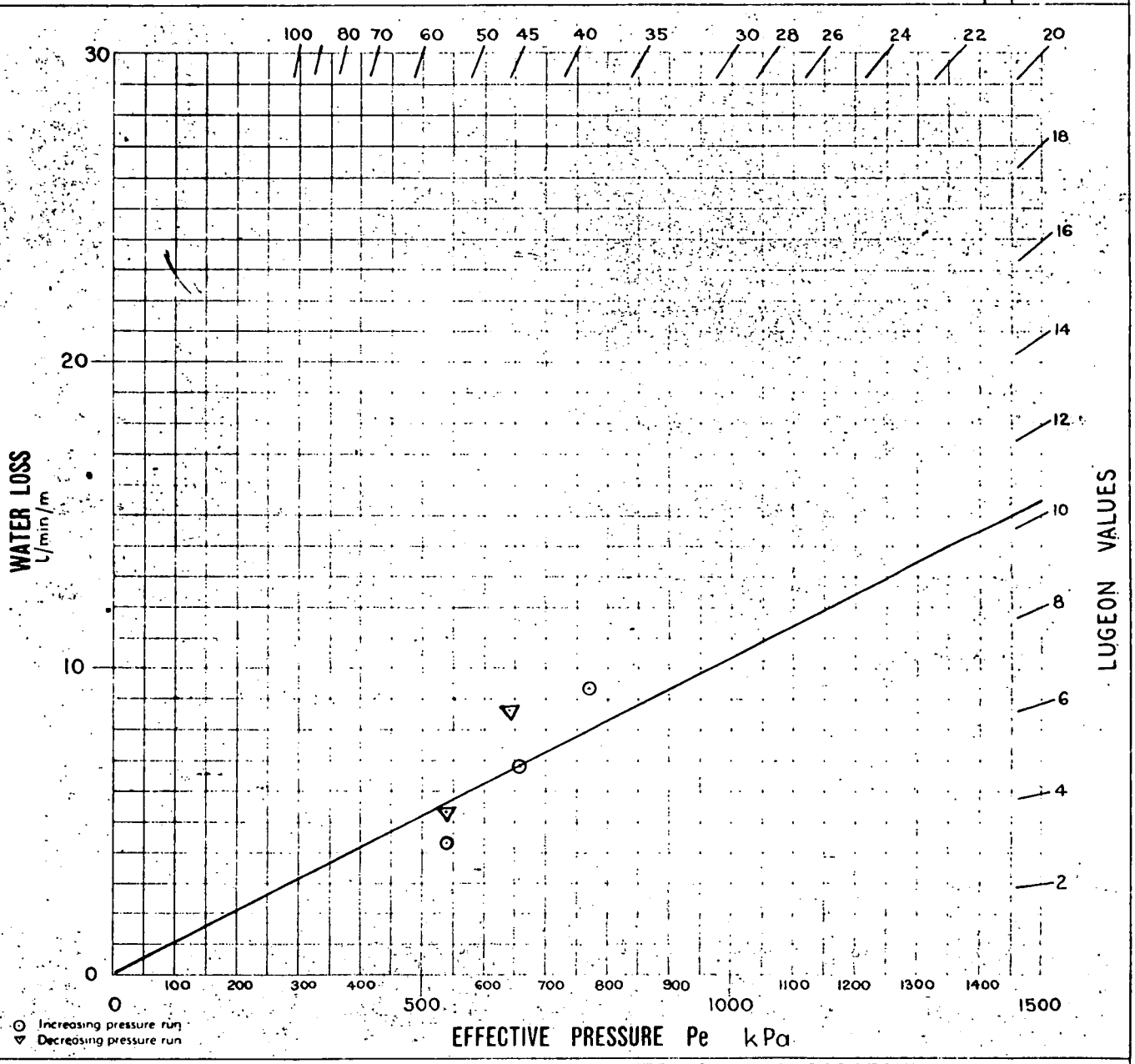
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH1

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar ... metres Datum ...

SECTION TESTED
From 46·50 m
To 50·06 m
Mean Depth 48·28 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift DRY m

Length of test section 3·56 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 48·28 m
Below pressure gauge, Hw 48·78 m

Extra pressure due to head of water column, Pw 414·4 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	3·33	15·15	4·26	13·1	539
40	276	5·37	24·43	6·86	31·5	659
60	414	7·33	33·3	9·35	55	773
40	276	6·73	30·62	8·6	47	643
20	138	4·0	18·2	5·11	18·3	534

PACKER TYPE HYDRAULIC

Date of Test 16·7·73
Test by J. Jensen
Calc by B. Taylor
Checked ...

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure test see Drg No. 5

Ps is obtained from Drg No. 10 006

* 100 kPa (kilopascal) = 1 bar

Drg No Ha 3 S10528g

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH2
SERIAL No 603/74

PROJECT BAROSSA DAM.
FEATURE. FOUNDATIONS.
LOCATION BAROSSA VALLEY.
SECTION 1. HUNDRED BAROSSA.
CO-ORDINATES
ANGLE FROM HORIZ 60° DIRECTION 225.
E. L. Surface 266·1 m
E. L. Collar — m
Datum A·H·D.

DESCRIPTION OF CORE	② GROUP SYMBOL	① STRENGTH TERM VS S MS W VW SO	CORE SIZE DEPTH E.L. m	LOG	③ FRACTURE LOG 2 10 50 200	STRUCTURES JOINTS, VEINS, SEAMS, SHEARED ZONES, CRUSHED ZONES	LIFT CORE LOSS% 10 5 50	WATER LEVEL DATE	CASING	DRILL WATER LOSS % C 10	WATER PRESSURE TESTS ④ LUGEONS C 1 5 10
SANDSTONE, grey, medium grained, micaceous			0			Broken & rubbly					
			1		RUBBLE						
SILTSTONE, dark grey			2			Bedding dips 50°					
SANDSTONE, grey fine to medium grained			3			Bedding dips 50°					
			4			Seam 4 mm with brown SILT SOIL (ML)					
			5								(115)
			6			Veins to 10mm - highly weathered Quartz & mica. Associated joints contain SILT SOIL (ML)					
			7								
Rock fabric shows micro-pitting due to partial weathering of feldspars			8			Cross joints dipping 45° & 30°					(170)
			9			Joints dips 70° Bedding dips 45° 3 cross joints at 40°-60° & 10°					
			10								
			11								(176)
			12		BROKEN	Bedding dips 40° Rock is completely weathered along joints containing CLAY (CL) material.					
SILTSTONE, grey-brown weathered			13								(353)
SANDSTONE fine medium			14			Bedding dips 40°					
Occasional black heavy mineral bands > 2mm thick			15								
			16			Vert joint					
			17			Cross joints dipping 65° and 35°					(353)
			18								
Sandstone is coarser after 16m			19								(473)
			20								

PROTEROZOIC – RHYNIE SANDSTONE FORMATION

JOINTS are rough planar shiny & ironstained

JOINTS are rough & ironstained

50 10 2 0·5 length of core in cms

① ROCK SUBSTANCE
STRENGTH TERM
VS–Very Strong
S–Strong
MS–Medium Strong
W–Weak
VW–Very Weak
SO–Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
2 10 50 200 Natural fractures per metre of core
50 10 2 0·5 Equivalent length of core in cm

④ (350) Maximum effective pressure (Kilopascals) reached during test.
Min. = Minimum value.

ENGINEERING GEOLOGY SECTION

DRILL No Mindrill
TYPE
DRILLER J. JENSEN
START 18 July 1973
FINISH 26 July 1973

LOGGED J. Selby
DATE 24 SEPT 73
TRACED G.M.
CHECKED

SHEET 1 OF 3. DRG No. S10527 Ha 3

RE No. S5027E MB

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH2

SERIAL No. 603/74

PROJECT. BAROSSA DAM

FEATURE. FOUNDATIONS

LOCATION BAROSSA VALLEY

SECTION 1 HUNDRED BAROSSA

CO-ORDINATES

ANGLE FROM HORIZ. 60° DIRECTION 225°

E. L. Surface 266·1 m

E.L Collar — m

Datum A·H·D

DESCRIPTION OF CORE	② GROUP SYMBOL	① STRENGTH TERM VS S MS W VW SO	CORE SIZE	DEPTH E.L m	LOG	③ FRACTURE LOG 2 10 50 200	STRUCTURES JOINTS, VEINS, SEAMS, SHEARED ZONES, CRUSHED ZONES	LIFT CORE LOSS% 10 50	WATER LEVEL DATE	CASING	DRILL WATER LOSS% 0 100	④ WATER PRESSURE TESTS LUGEONS 0·5 1 5 10 50
SANDSTONE				20			Limonite encrusted joints up to 3mm					(423)
SILTSTONE, micaceous grey brown & weathered				21								
SANDSTONE, grey medium to coarse				22	BROKEN		Parts are completely weathered to greenish compact SILT SOIL (ML)					
				23			Undulating vertical joint					(492)
				24			Bedding dips 40°					
				25			Vertical quartz veins 2mm					
				26								(492)
faint heavy mineral banding up to 1mm				27			Seam is decomposed siltstone band with SILT SOIL coatings					
				28			Several close parallel joints					
				29								(492)
				30								
				31			Cross joints 40° to 50°					
				32			Bedding dips 35°					(492)
				33								
				34								
				35			Joints are less iron-stained					(492)
Feldspars are decomposed				36								
				37								
				38								
				39								(459)
Feldspars are decomposed				40	BROKEN		Sandstone is decomposed & SANDY					

JOINTS are rough, planar and iron-stained

PROTEROZOIC – RHYNIE SANDSTONE FORMATION

50 10 2 0·5 length of core in cms

① ROCK SUBSTANCE
STRENGTH TERM
VS–Very Strong
S–Strong
MS–Medium Strong
W–Weak
VW–Very Weak
SO–Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
2 10 50 200 Natural fractures per metre of core
50 10 2 0·5 Equivalent length of core in cm

④ (350) Maximum effective pressure (Kilopascals) reached during test.
Min. Minimum value.

ENGINEERING GEOLOGY SECTION

DRILL No.
TYPE Mindrill
DRILLER J. JENSEN
START 18TH JULY 73
FINISH 26 July 73

LOGGED J. Selby
DATE 28·9·73
TRACED G.M
CHECKED

SHEET 2 OF 3. DRG. No. S10527a Ha 3

P.F. No. S5027E MB

DEPARTMENT OF MINES SOUTH AUSTRALIA

LOG OF DIAMOND DRILL HOLE

HOLE NO. DH2

SERIAL No 603/74

PROJECT BAROSSA DAM

FEATURE FOUNDATIONS

LOCATION BAROSSA VALLEY

SECTION . . . HUNDRED

CO-ORDINATES

ANGLE FROM HORIZ 60° . DIRECTION 225

E.L. Surface 266·1 m

E.L. Collar . . . m

Datum . A.H.D

DESCRIPTION OF CORE	② GROUP SYMBOL	① STRENGTH TERM (VS, S, MS, W, VW, SO)	CORE SIZE DEPTH (mm)	LOG	③ FRACTURE LOG (2, 10, 50, 200)	STRUCTURES JOINTS, VEINS, SEAMS, SHEARED ZONES, CRUSHED ZONES	LIFT CORE LOSS % (1C, 50)	WATER LEVEL CASING DATE	DRILL WATER LOSS % (0, 100)	④ WATER PRESSURE TESTS LUGEONS (0·5, 1, 5, 10, 50, 100)
SANDSTONE, grey medium coarse to coarse	PROTEROZOIC – RHYNIE SANDSTONE FORMATION		40		NO CORE	Core lost in sandy friable material				
			41							
			42							(197)
			43			Joints dip at 45°–60°				
			44							
			45			Bedding dips 35°				(445)
			46							
			47							
Possible fault zone Spots of dark mineralisation up to 3 mm			48	T		Rock is broken and sandy but not ironstained				(265)
			49		BROKEN					
			50			END OF HOLE 50 metres				

JOINTS rough, planar, clean

① ROCK SUBSTANCE STRENGTH TERM
VS–Very Strong
S–Strong
MS–Medium Strong
W–Weak
VW–Very Weak
SO–Soil properties

CONDITION TERM
Fresh
Weathered
Altered
Not Applicable

② Substances with soil properties remoulded and classified by Unified System

③ FRACTURE LOG
50 10 2 0·5 length of core in cms
2 10 50 200 Natural fractures per metre of core
50 10 2 0·5 Equivalent length of core in cm

④ (350) Maximum effective pressure (Kilopascals) reached during test.
Min. Minimum value.

ENGINEERING GEOLOGY SECTION

DRILL No .
TYPE Mwdrill
DRILLER J. JENSEN
START 18 JULY 73
FINISH 26 JULY 73

LOGGED J. SELBY
DATE 28·9·73
TRACED G.M
CHECKED

SHEET 3 OF 3 . DRG. No S10627b Hg3

P.E. No. S5027E MB

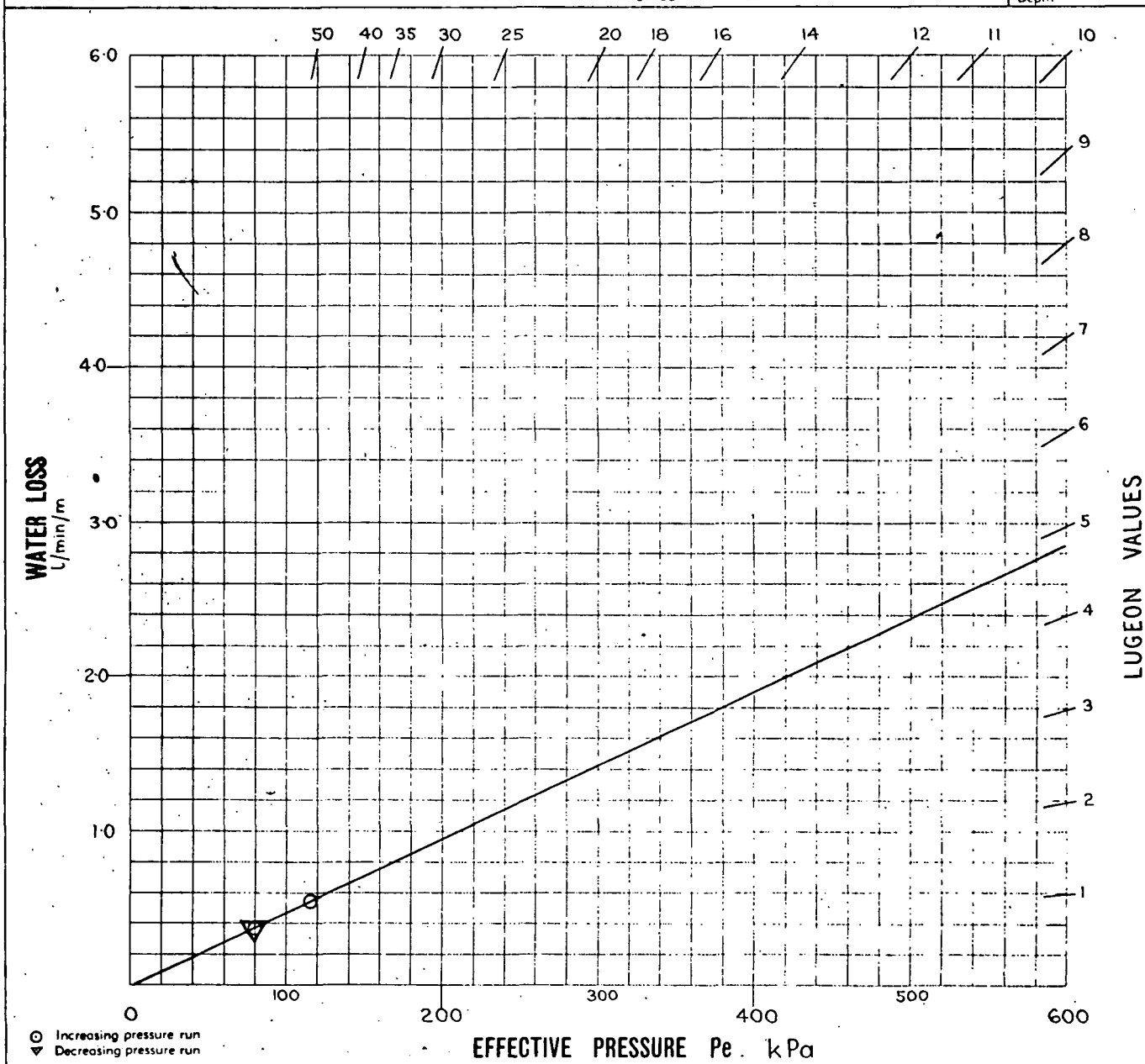
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collor. . . . metres Datum

SECTION TESTED
From 3·10 m
To 6·71 m
Mean Depth 4·91 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·55 m

Length of test section 3·91 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 4·91 m
Below pressure gauge, Hw 5·41 m
Extra pressure due to head of water column, Pw 45·96 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
5	34·5	0·29	1·32	0·37	—	80·5
10	69·0	0·45	2·05	0·57	—	115
5	34·5	0·29	1·32	0·37	—	80·5

PACKER TYPE HYDRAULIC

Date of Test 18·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No. S

Ps is obtained from Drg No. 10 006
* 100 kPa (kilopascal) = 1 bar

Drg No S10529
Ha3

50 LUGEON PF S10020a MB IMPERIAL – METRIC

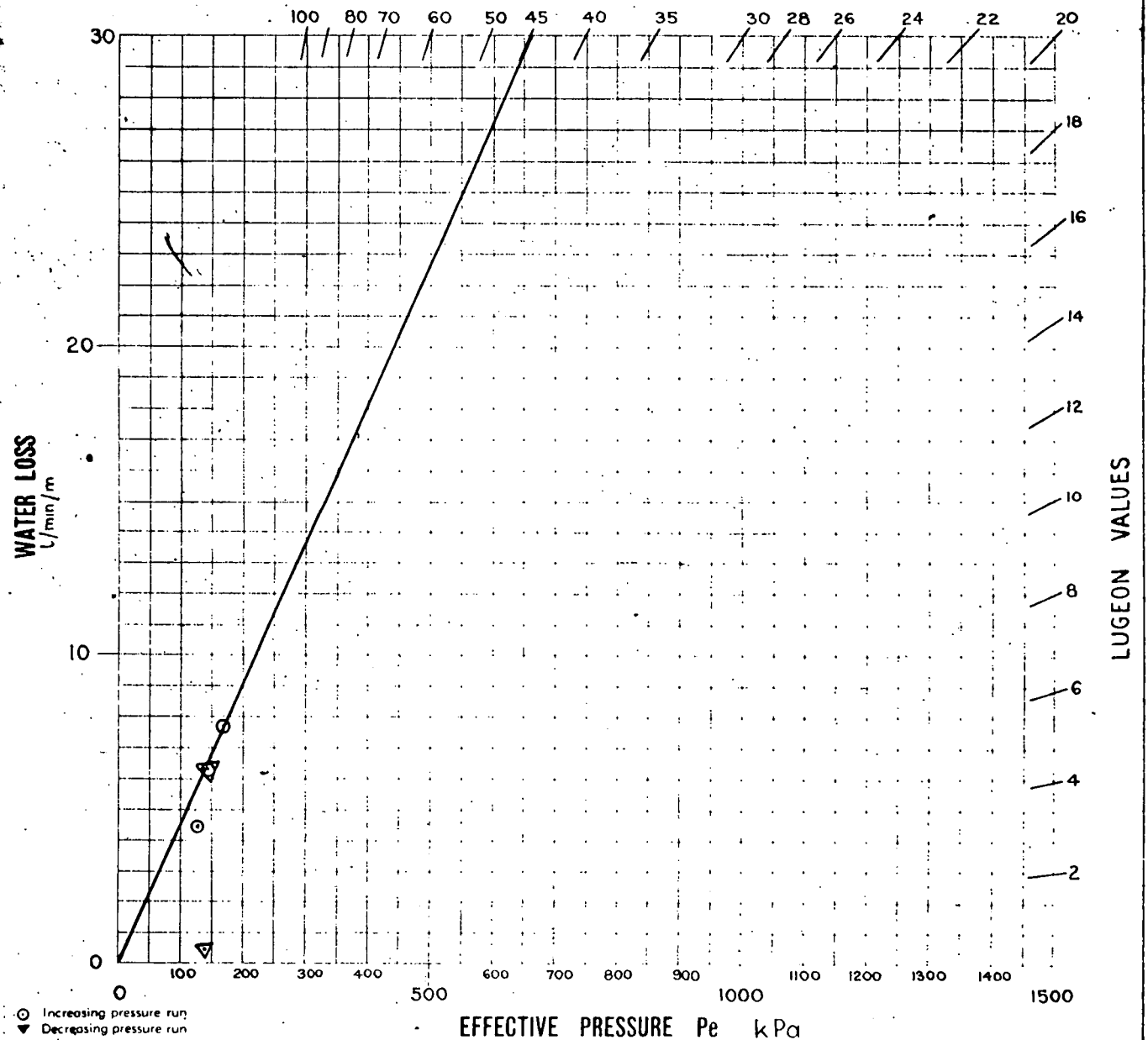
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar. . . . metres Datum.

SECTION TESTED
From 6·20 m
To 9·82 m
Mean Depth 8·01 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·55 m

Length of test section .... 3·62 .m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·01 m
Below pressure gauge. Hw 8·51 m
Extra pressure due to head of water column, Pw. 72·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
10	69	3·57	16·24	4·50	15·4	126
15	103·5	5·04	22·93	6·35	27·9	148
20	138	6·13	27·89	7·73	40	170
15	103·5	4·97	22·61	6·26	27·5	148
10	69	0·39	1·77	0·49	—	141

PACKER TYPE HYDRAULIC

Date of Test 18·7·73
Test by J. Jensen
Calc by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure tests see Drg No S

Ps is obtained from Drg No 10.006

* 100 kPa (kilopascal) = 1 bar

Drg No S10529a

100 LUGEON PF S10020 MB IMPERIAL – METRIC

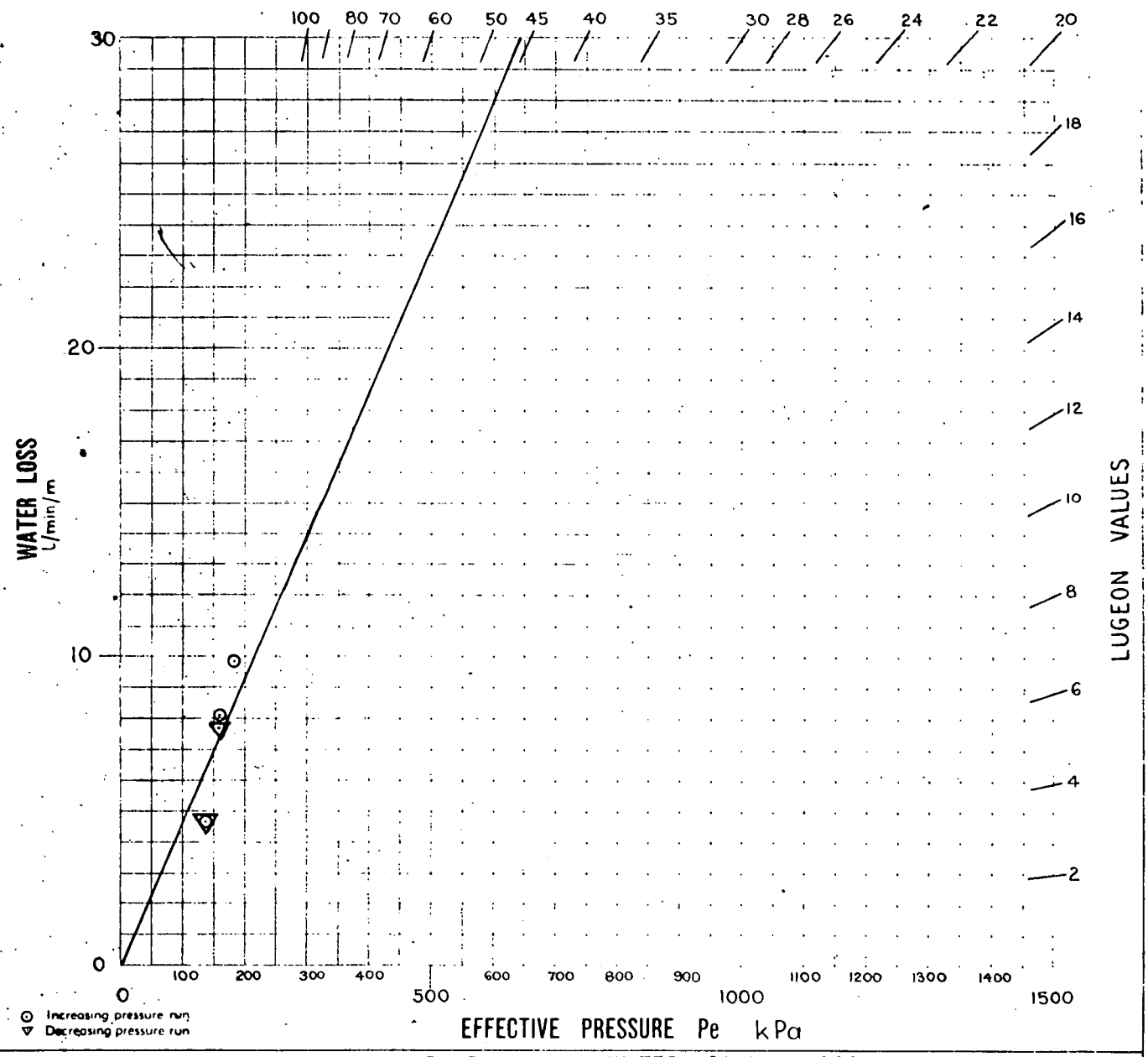
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar ..... metres Datum

SECTION TESTED
From 9·70 m
To 12·50 m
Mean Depth 11·1 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·60 m

Length of test section ..... 2·8 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·60 m
Below pressure gauge, Hw 9·10 m
Extra pressure due to head of water column, Pw 77·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa	WATER LOSS gall/min	L/min	L/min, m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
10	69	2·94	13·38	4·78	10·7	136
15	103·5	4·95	22·52	8·04	27	154
20	138	6·1	27·76	9·91	39·5	176
15	103·5	4·78	21·75	7·77	25·8	155
10	69	2·99	13·60	4·86	10·8	136

PACKER TYPE
HYDRAULIC

Date of Test 19·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked
Drg No S10529 b
Hg 3

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No S
Ps is obtained from Drg No 10 006
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

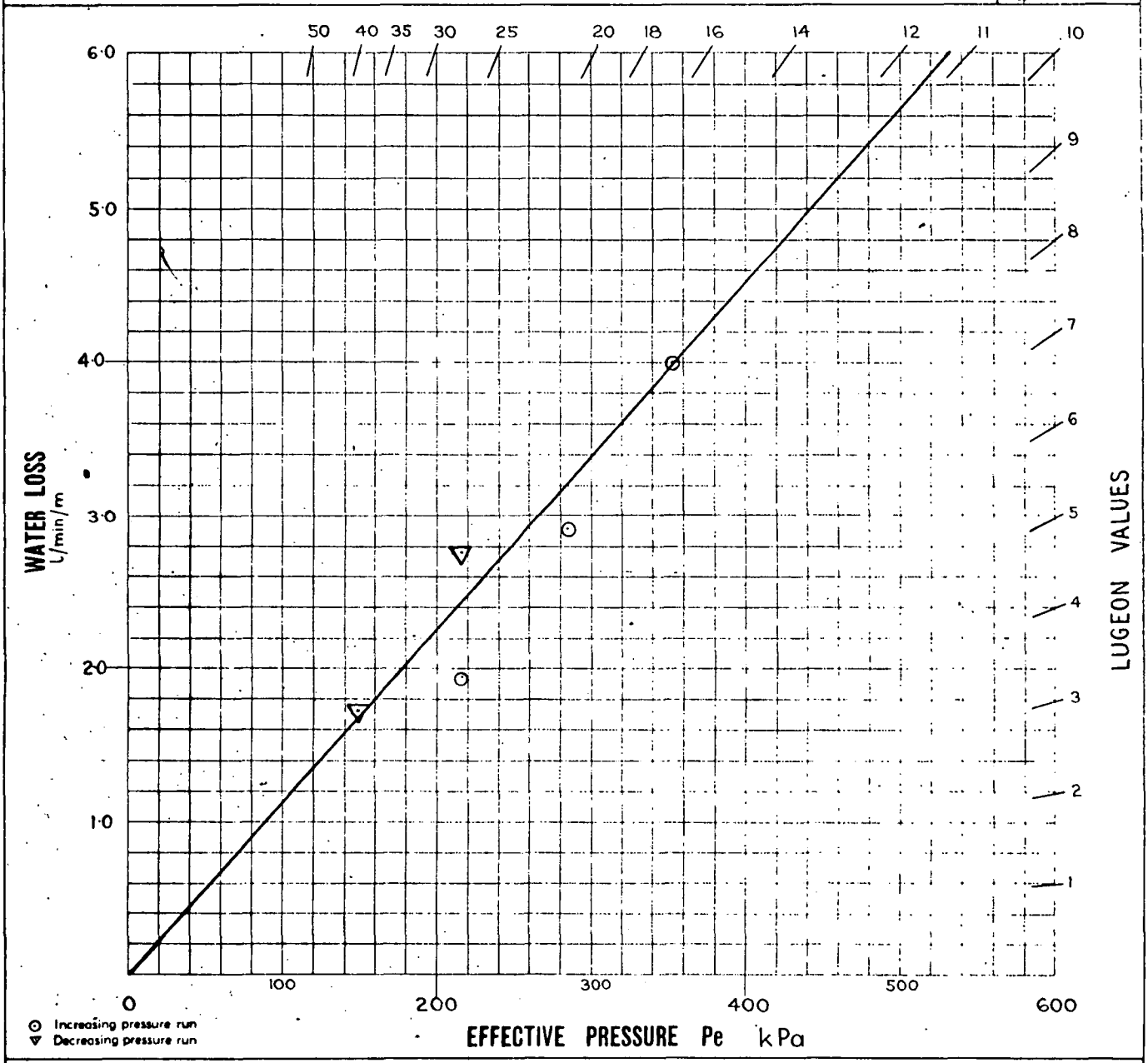
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATION
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 12·10 m
To 15·46 m
Mean Depth 13·78 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·60 m

Length of test section 3·36 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·60m
Below pressure gauge, Hw 9·10 m
Extra pressure due to head of water column, Pw. 77·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	1·43	6·51	1·94	—	215
30	207	2·15	9·78	2·91	—	284
40	276	2·96	13·5	4·0	—	353
20	138	2·05	9·33	2·78	—	215
10	69	1·27	5·78	1·72	—	146

PACKER TYPE HYDRAULIC

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No. 5

Ps is obtained from Drg No. 0·006
* 100 kPa (kilopascal) = 1 bar

Date of Test 19·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10529c

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

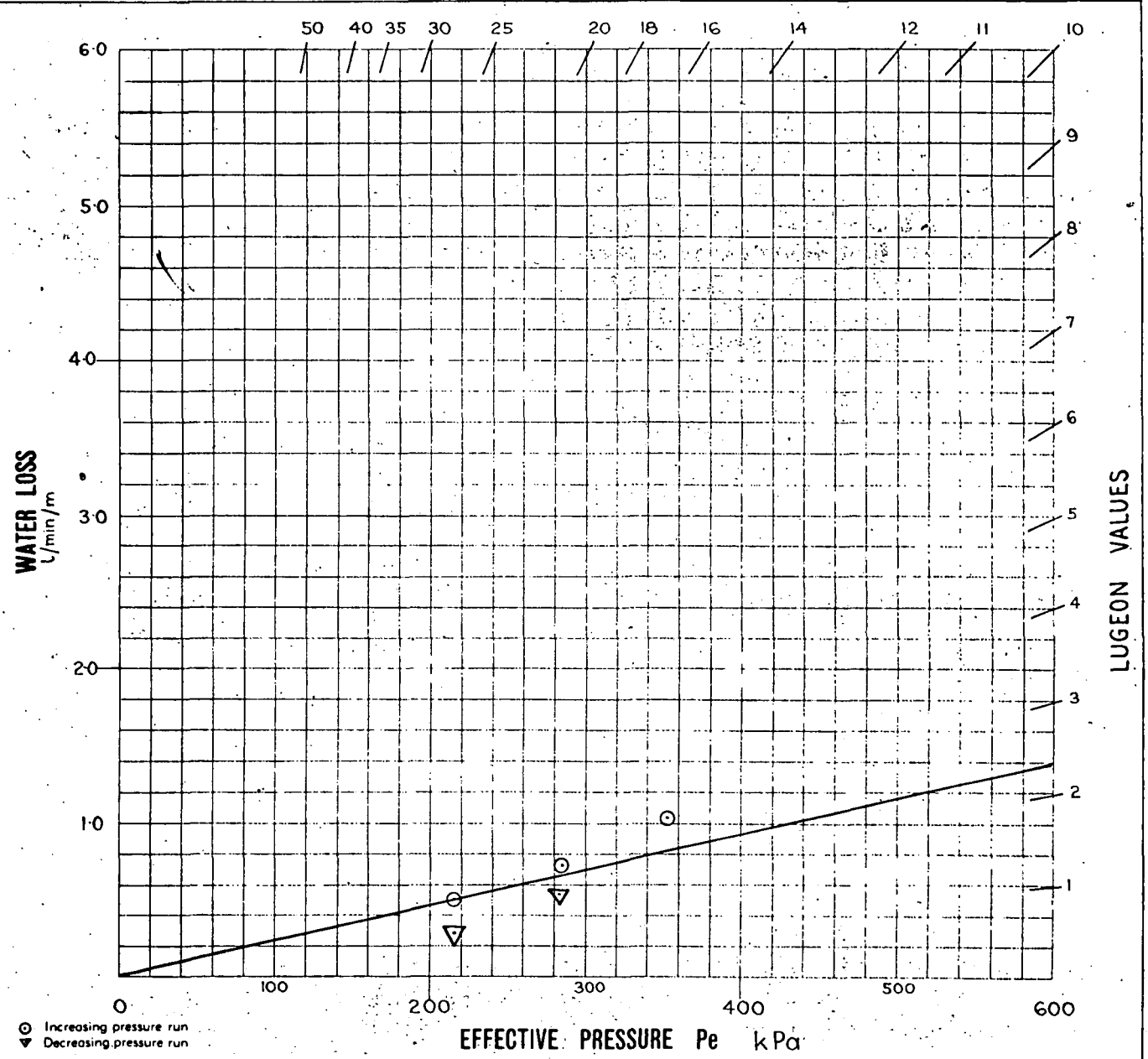
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 15·20 m
To 18·62 m
Mean Depth 16·91 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·60 m

Length of test section 3·42 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 8·60 m
Below pressure gauge. Hw 9·10 m

Extra pressure due to head of water column, Pw 77·3 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·4	1·82	0·53	—	215
30	207	0·55	2·50	0·73	—	284
40	276	0·76	3·46	1·01	—	353
30	207	0·43	1·96	0·57	—	284
20	138	0·20	0·91	0·27	—	215

PACKER TYPE HYDRAULIC

Date of Test 19·7·73
Test by J. Jensen
Calc. by B. Taylor
Checked
Drg. No S10529d

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No. S 10006

Ps is obtained from Drg No
* 100 kPa (kilopascal) = 1 bar

50 LUGEON PF S10020d MB IMPERIAL − METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

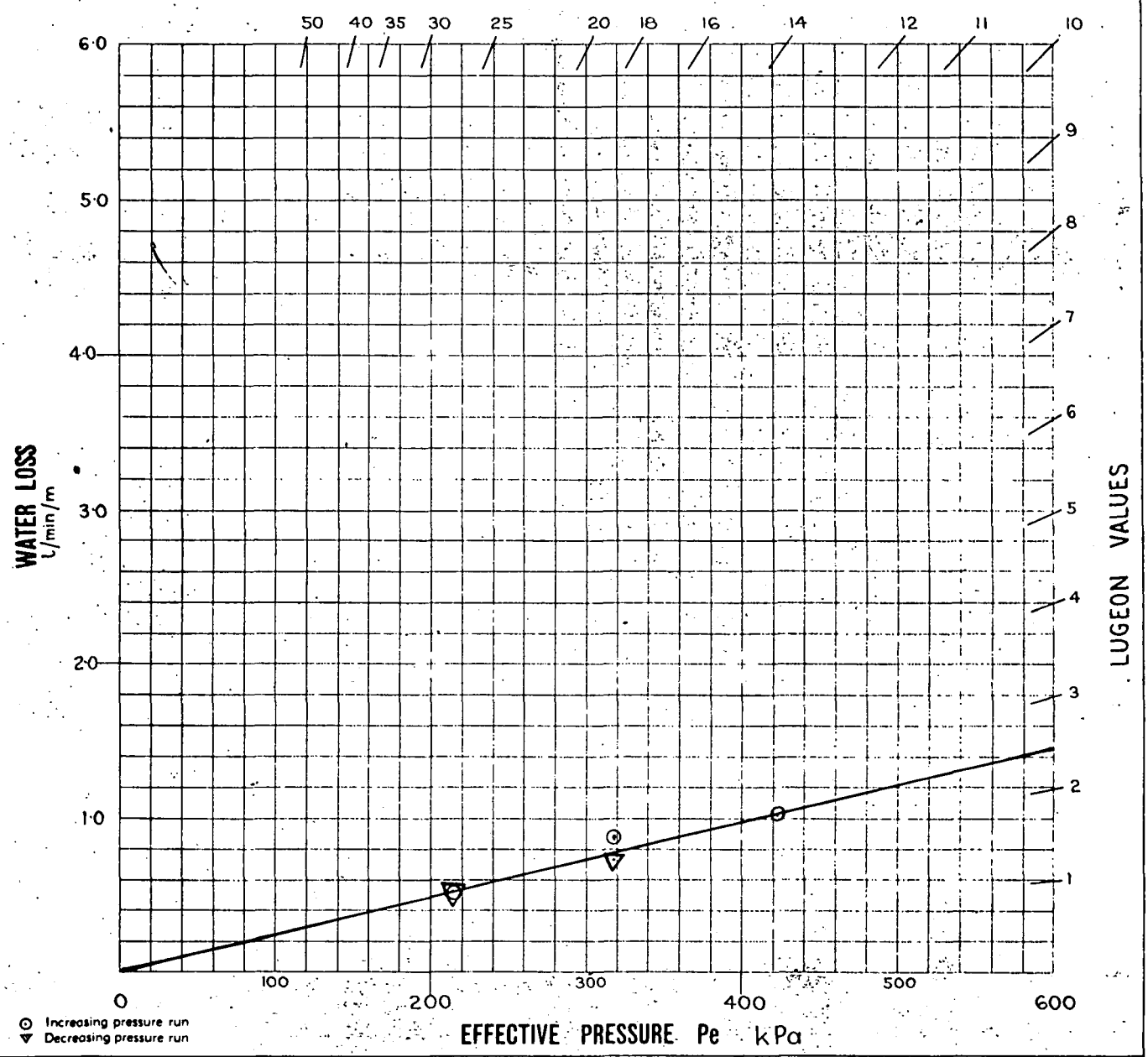
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

SECTION TESTED
From 18·25 m
To 21·60 m
Mean Depth 19·93 m

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·62 m

Length of test section 3·35 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 8·62 m
Below pressure gauge, Hw 9·12 m

Extra pressure due to head of water column, Pw 78 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·4	1·82	0·54	—	216
35	241	0·63	2·87	0·86	—	319
50	345	0·75	3·41	1·02	—	423
35	241	0·52	2·37	0·71	—	319
20	138	0·39	1·77	0·53	—	216

PACKER TYPE HYDRAULIC

Date of Test 20·7·73
Test by J.Jensen
Calc. by B.Taylor
Checked
Drg No S10529e

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps. For general layout of water pressure tests see Drg No.

Ps is obtained from Drg No 10 006

* 100 kPa (kilopascal) = 1 bar

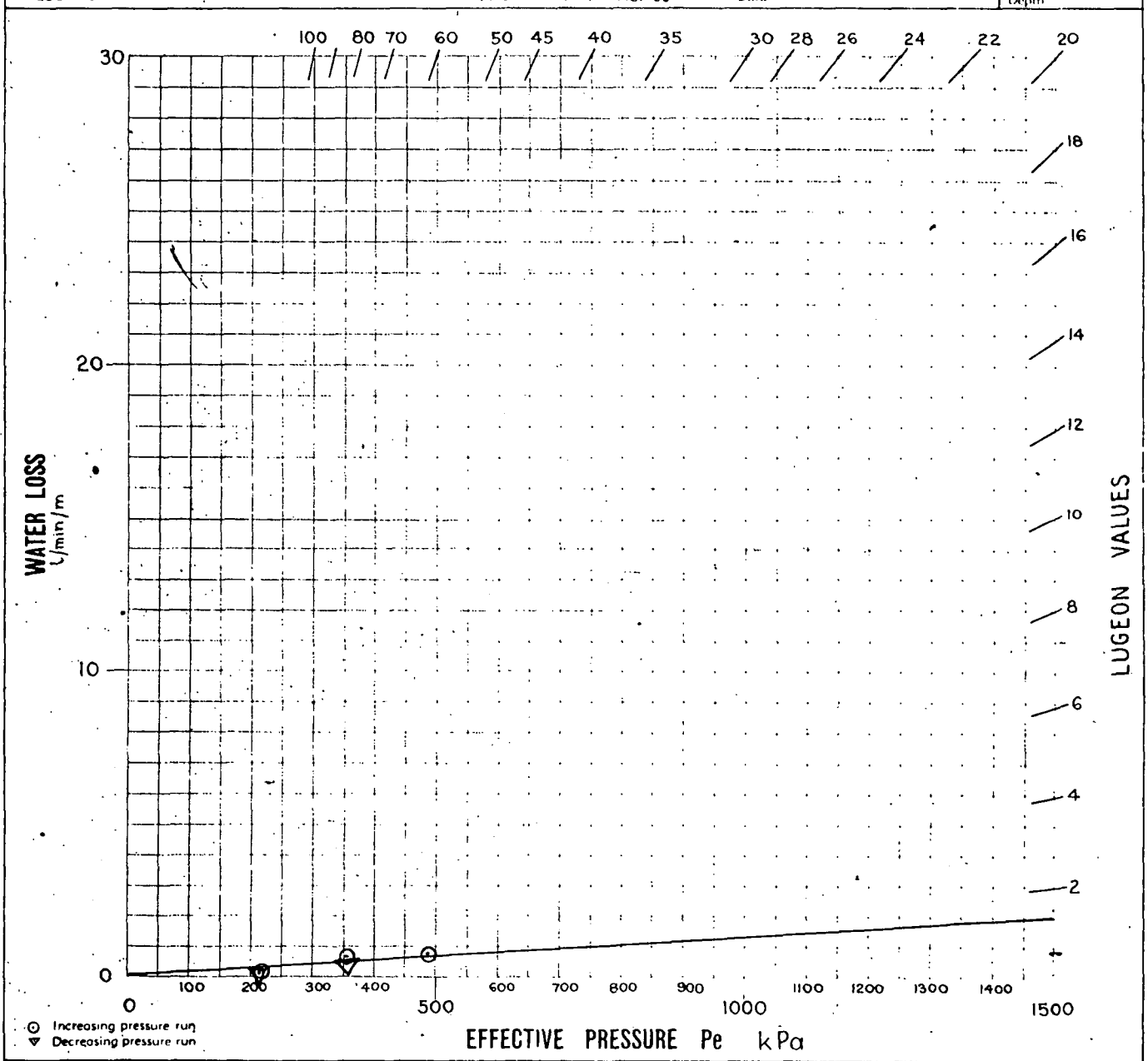
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 21·30 m
To 25·20 m
Mean Depth 23·25 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·62 m

Length of test section 3·90 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·62 m
Below pressure gauge Hw 9·12 m
Extra pressure due to head of water column, Pw 7·8 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·13	0·59	0·15	—	216
40	276	0·49	2·23	0·57	—	354
60	414	0·57	2·59	0·66	—	492
40	276	0·39	1·77	0·45	—	354
20	138	0·12	0·55	0·14	—	216

PACKER TYPE HYDRAULIC

Date of Test 20·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10529f

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No S 10.006
Ps is obtained from Drg No
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

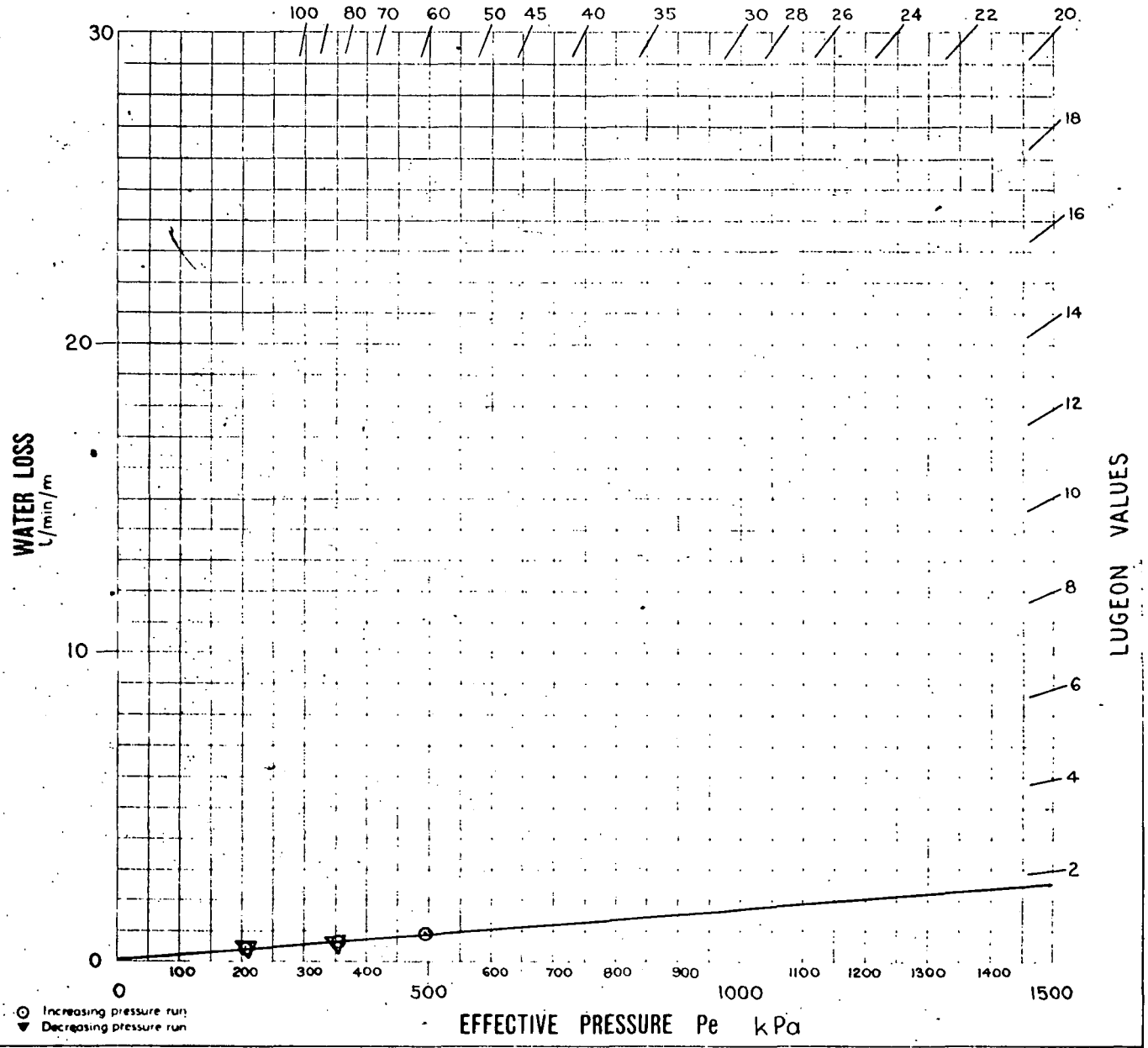
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING, GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 24·35 m
To 28·00 m
Mean Depth 26·18 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·65 m

Length of test section 3·65 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 8·65 m
Below pressure gauge Hw 9·15 m

Extra pressure due to head of water column, Pw .78 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·35	1·59	0·44	–	216
40	276	0·53	2·41	0·66	–	354
60	414	0·73	3·32	0·91	–	492
40	276	0·53	2·41	0·66	–	354
20	138	0·33	1·50	0·41	–	216

PACKER TYPE HYDRAULIC

Date of Test 22·2·73
Test by J. Jensen
Calc by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw – Ps

For general layout of water pressure tests see Drg No S

Ps is obtained from Drg No 10 006

* 100 kPa (kilopascal) = 1 bar

Drg No S10529g
H&3

100 LUGEON PF S10020 MB IMPERIAL – METRIC

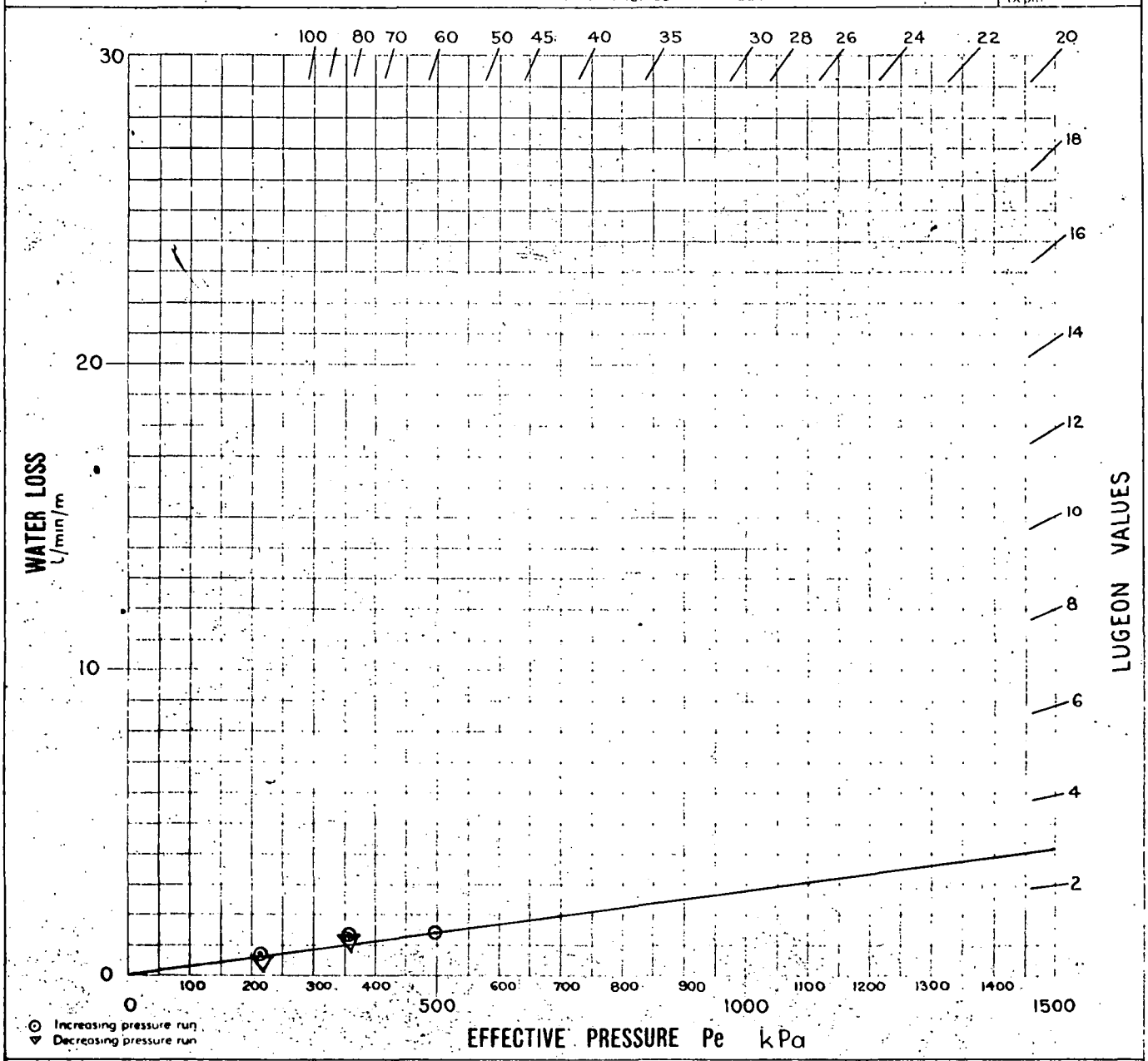
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum

SECTION TESTED
From 27·40 m
To 30·95 m
Mean Depth 29·17 m



Slope height of pressure gauge above collar 0·50 m
Groundwater level at beginning of shift 8·70 m
Length of test section 3·55 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·70 m
Below pressure gauge Hw 9·20 m
Extra pressure due to head of water column, Pw 78 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·53	2·41	0·68	–	216
40	276	0·96	4·37	1·23	–	354
60	414	1·05	4·78	1·35	–	492
40	276	0·85	3·87	1·09	–	354
20	138	0·45	2·05	0·58	–	216

PACKER TYPE HYDRAULIC

Date of Test 23·7·73
Test by J. Jensen
Calc by B. Taylor
Checked

Pw = Hw sin θ × 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No S
Ps is obtained from Drg No 10.006
* 100 kPa (kilopascal) = 1 bar

Drg No S10529h
Hb3

100 LUGEON PF S10020 MB IMPERIAL – METRIC

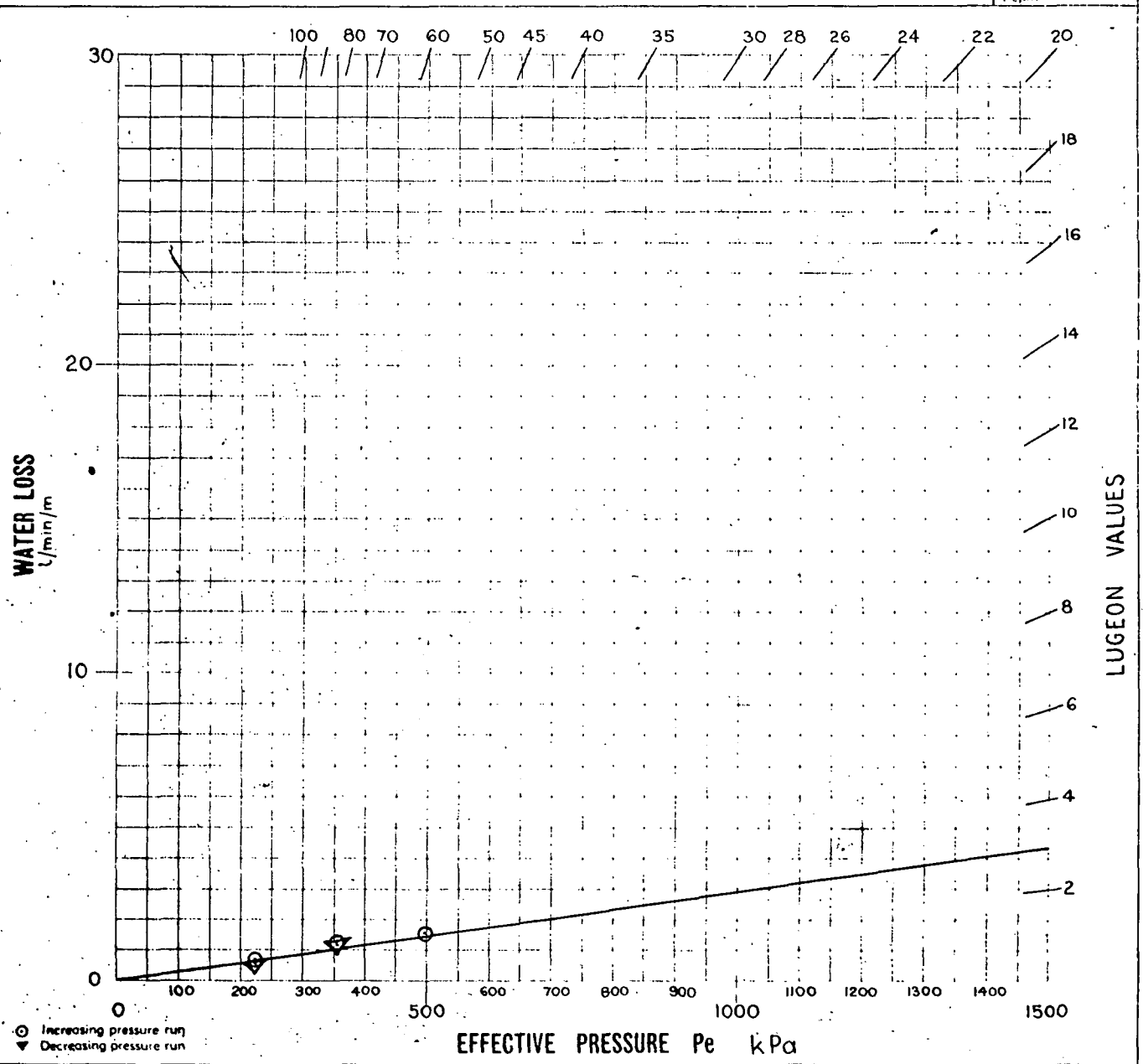
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine = 0·866) DIRECTION
R.L. Collar . . . metres Datum .

SECTION TESTED
From 30·45 m
To 34·18 m
Mean Depth 32·32 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·70 m

Length of test section 3·73 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·70 m
Below pressure gauge. Hw 9·20 m
Extra pressure due to head of water column, Pw .78 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	l/min	l/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·55	2·50	0·70	—	216
40	276	0·95	4·32	1·22	—	354
60	414	1·21	5·51	1·55	—	492
40	276	0·86	3·91	1·10	—	354
20	138	0·51	2·32	0·65	—	216

PACKER TYPE HYDRAULIC

Date of Test 24·7·73
Test by J. Jensen
Calc by B. Taylor
Checked

Drg No S10529 i
Hg 3

* Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps
For general layout of water pressure tests see Drg No. S 10.006
† Ps is obtained from Drg No
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF 510020 MB IMPERIAL – METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

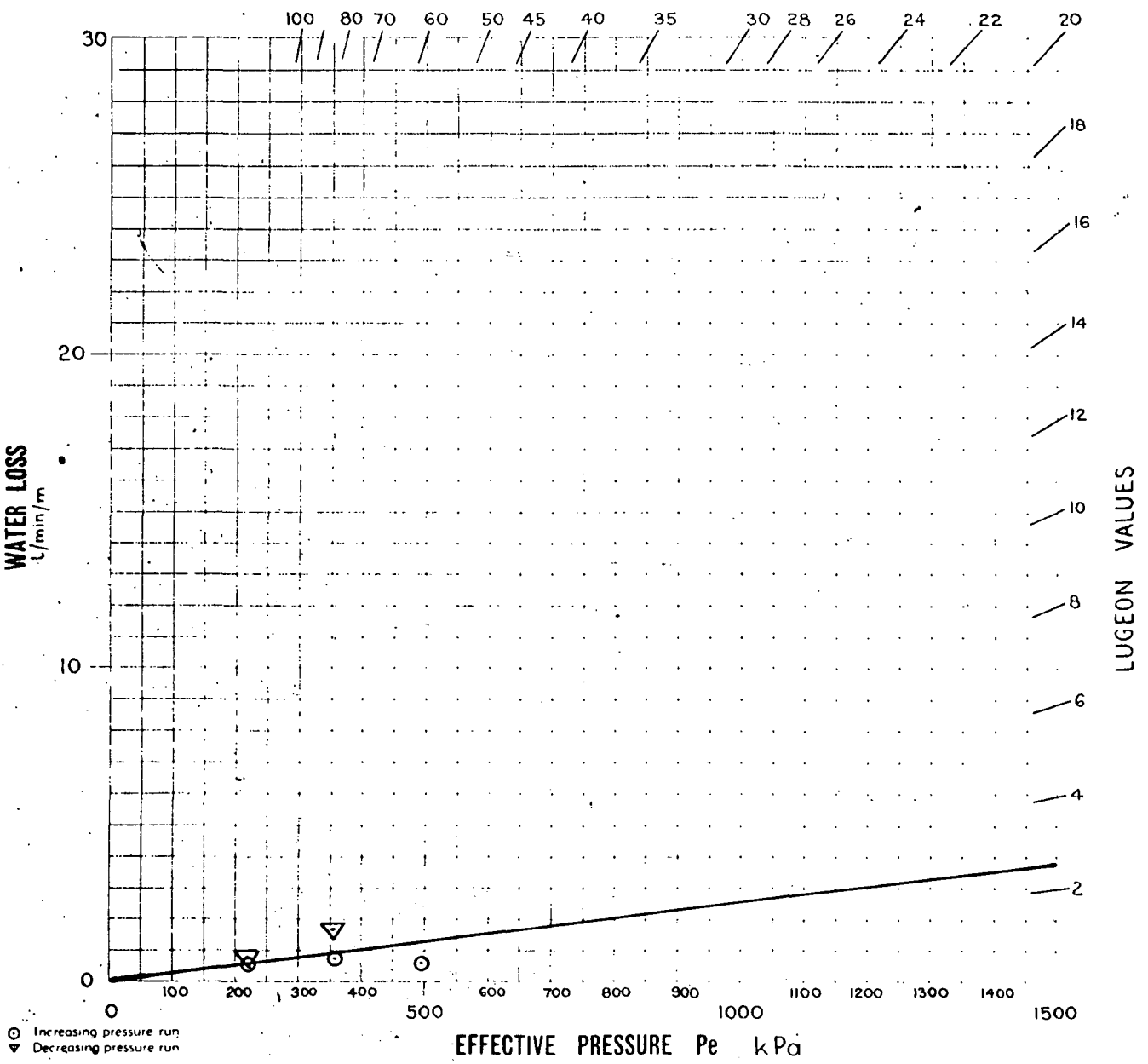
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225
R.L. Collar . . . metres Datum

SECTION TESTED
From 34·00 m
To 37·26 m
Water Depth 35·63 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·7 m

Length of test section 3·26 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 8·7 m
Below pressure gauge Hw 9·2 m

Extra pressure due to head of water column, Pw. 78 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·37	1·68	0·52	—	216
40	276	0·63	2·87	0·88	—	354
60	414	0·47	2·14	0·66	—	492
40	276	1·2	5·46	1·67	—	354
20	138	0·5	2·3	0·71	—	216

PACKER TYPE
HYDRAULIC

Date of Test 24·7·73
Test by J. Jensen
Calc by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure tests see Drg No

Ps is obtained from Drg No 10 006

* 100 kPa (kilopascal) 1 bar

Drg No S10529 j

100 LUGEON PF 510020 MB IMPERIAL – METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

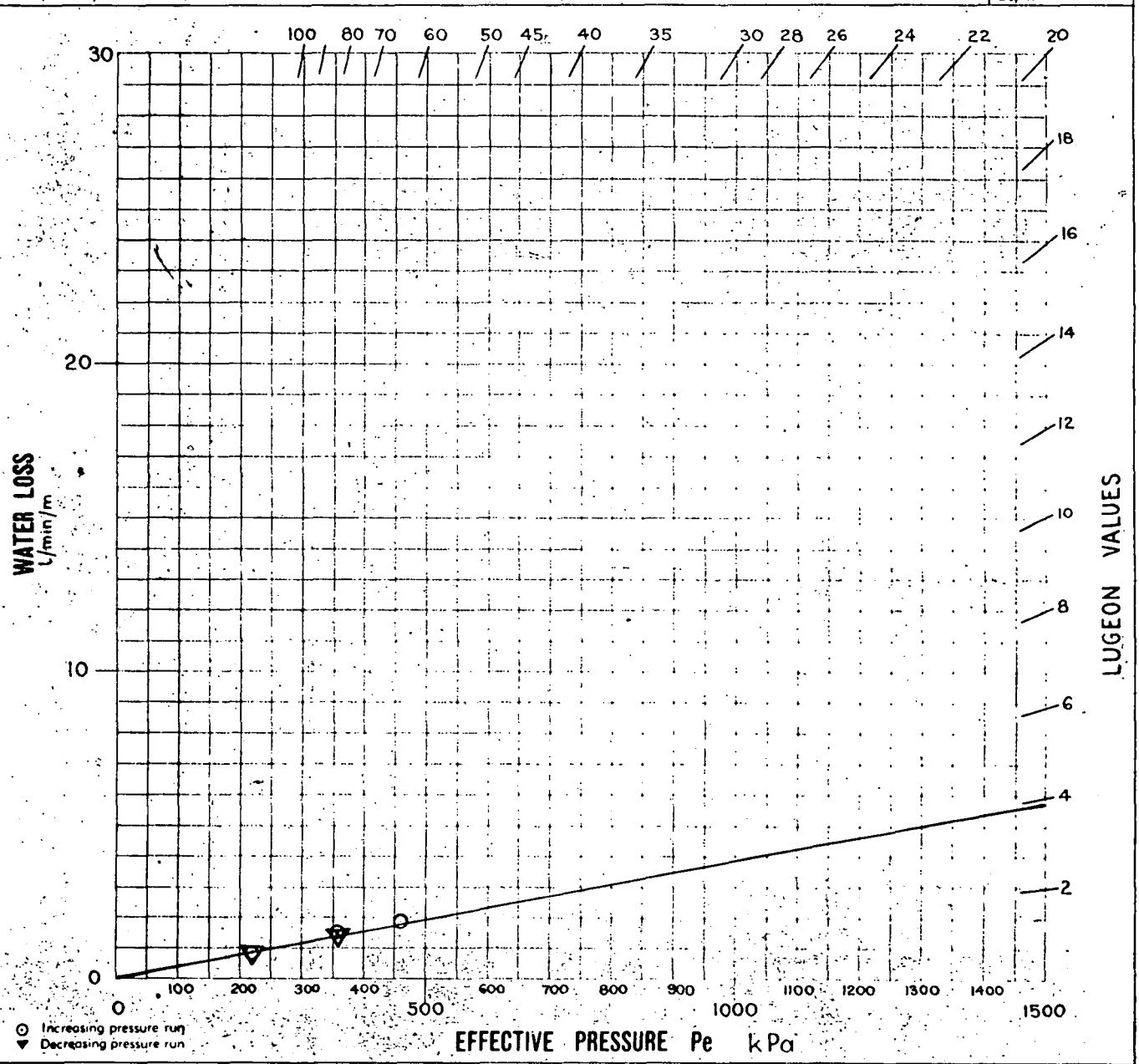
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar. .metres Datum.

SECTION TESTED
From 36·55 m
To 40·82 m
Mean Depth 38·69 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·75 m

Length of test section 4·27 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·75 m
Below pressure gauge Hw 9·25 m
Extra pressure due to head of water column, Pw 79 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	0·88	4·0	0·94	—	217
40	276	1·44	6·55	1·53	—	355
55	379·5	1·8	8·19	1·92	—	459
40	276	1·4	6·37	1·49	—	355
20	138	0·89	4·05	0·95	—	217

PACKER TYPE HYDRAULIC

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure tests see Drg No S

Ps is obtained from Drg No 10 006

* 100 kPa (kilopascal) = 1 bar

Date of Test 25·7·73
Test by J. Jensen
Calc by B. Taylor
Checked
Drg No S10529k Hd 3

100 LUGEON PF S10020 MB IMPERIAL – METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

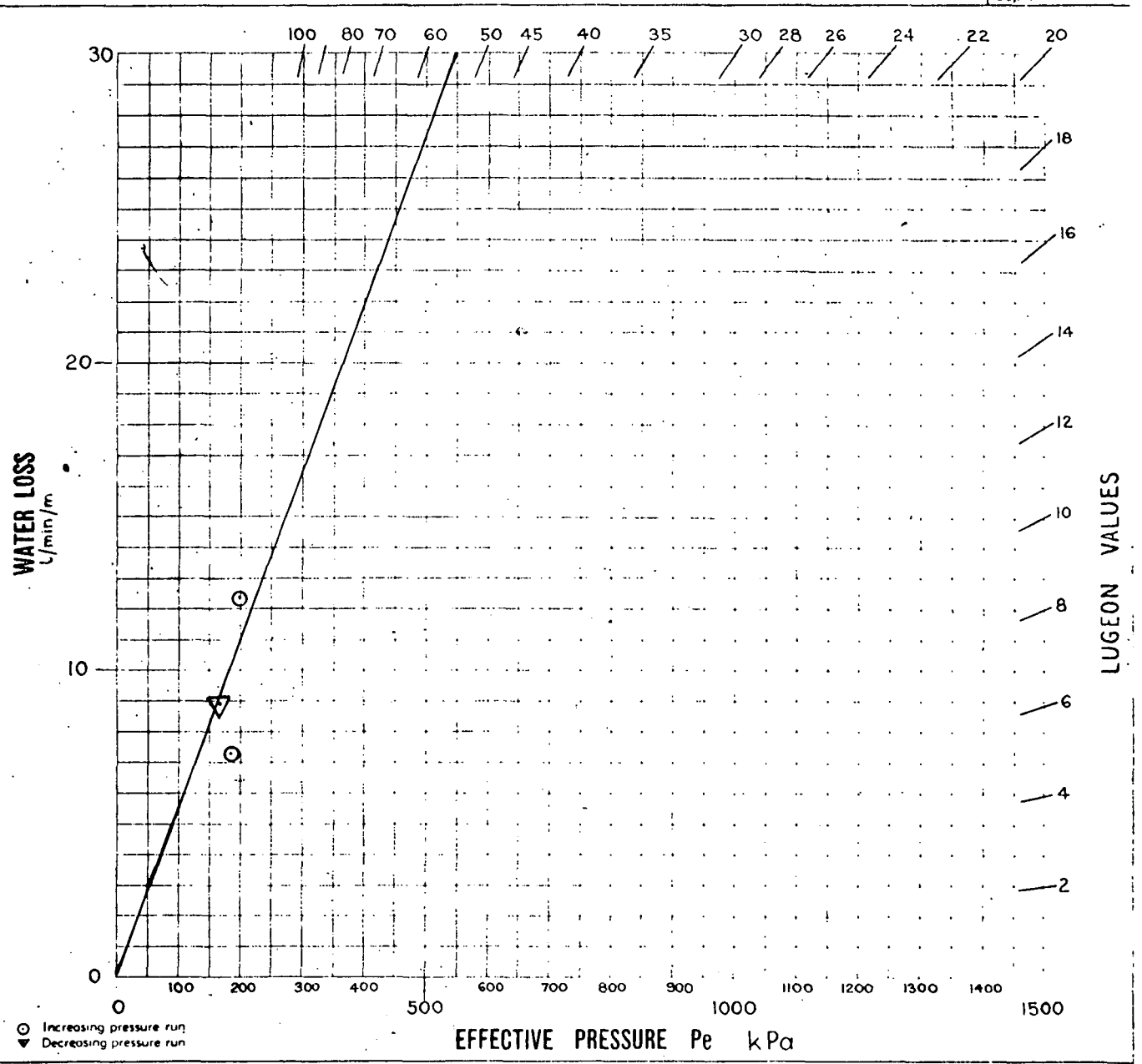
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar . . . metres Datum . . .

SECTION TESTED
From 40·20 m
To 43·75 m
Mean Depth 41·98 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·75 m

Length of test section 3·55 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·75 m
Below pressure gauge Hw 9·25 m
Extra pressure due to head of water column, Pw. 79 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min, m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	5·7	25·94	7·31	35	182
30	207	9·6	43·68	12·30	89	197
20	138	7·0	31·85	8·97	50·8	166

PACKER TYPE HYDRAULIC

Date of Test 25·7·73
Test by J. Jensen
Comp'd B. Taylor
Checked . . .
Drg. No. S10529 L

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure tests see Drg No S

Ps is obtained from Drg No 10 006

* 100 kPa (kilopascal) = 1 bar

H93

100 LUGEON P.E. S10020 MB IMPERIAL – METRIC

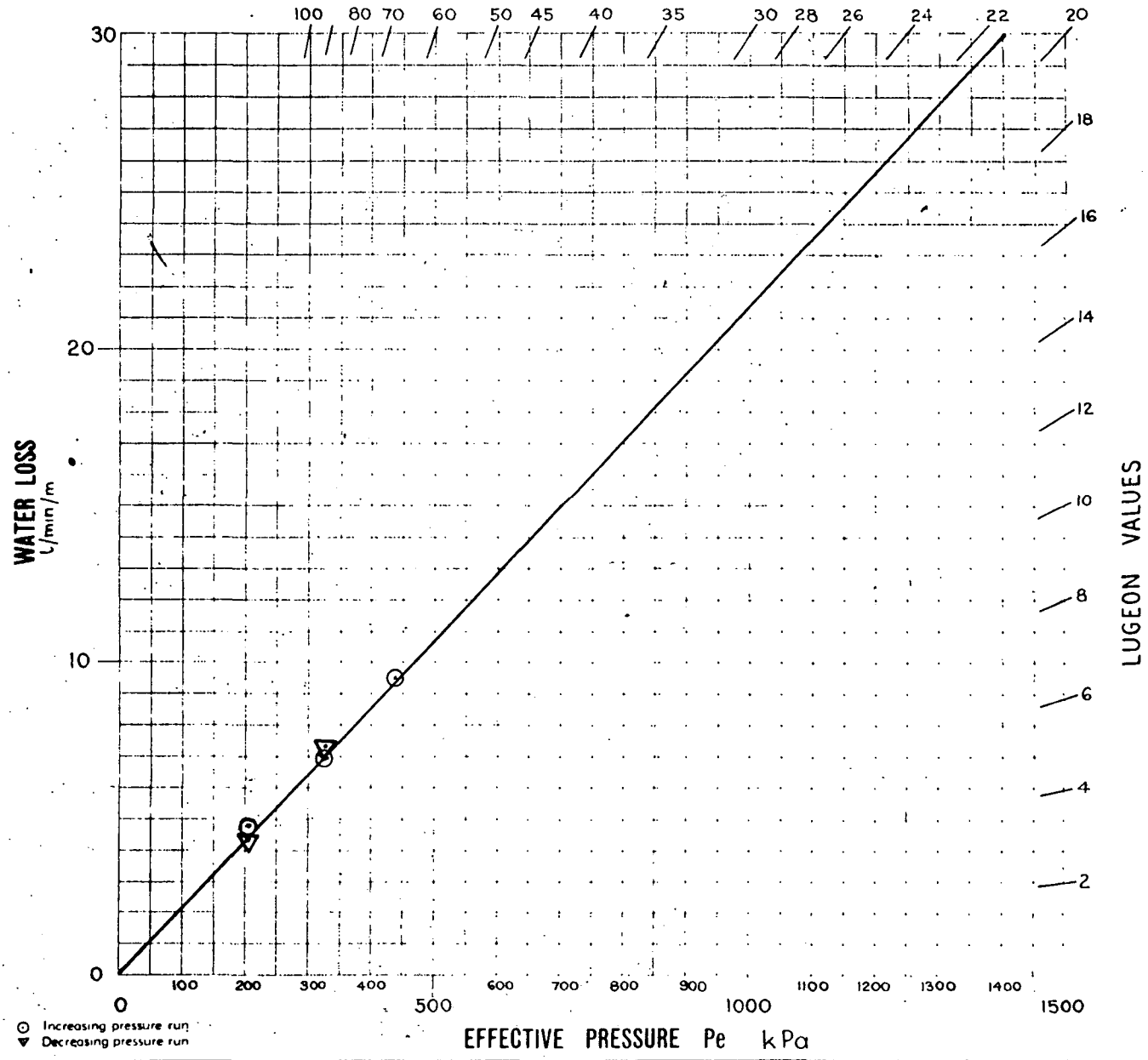
DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY
CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar metres Datum

SECTION TESTED
From 43·55 m
To 46·78 m
Mean Depth 45·17 m



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·80 m

Length of test section 3·23 m

WATER COLUMN CORRECTION

Slope height of water column above groundwater level
Below collar 8·80 m
Below pressure gauge Hw 9·30 m

Extra pressure due to head of water column, Pw .79 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/sec/m	SUPPLY LINE CORRECTION Ps kPa	EFFECTIVE PRESSURE Pe kPa
20	138	3·45	15·70	4·86	14	203
40	276	5·00	22·75	7·04	27·8	327
60	414	6·77	30·80	9·54	48	445
40	276	5·14	23·39	7·24	29·4	326
20	138	3·09	14·06	4·35	11·5	206

PACKER TYPE
HYDRAULIC

Date Tested 26·7·73
Tested by J Jensen
Calc by B. Taylor
Checked

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Ps

For general layout of water pressure tests see Dwg No

Ps as obtained from Dwg No 10 006

* 100 kPa (Kilopascal) = 1 bar

Dwg No S10529m

100 LUGEON PF S10020 MB IMPERIAL - METRIC

DEPARTMENT OF MINES · SOUTH AUSTRALIA
ENGINEERING GEOLOGY SECTION

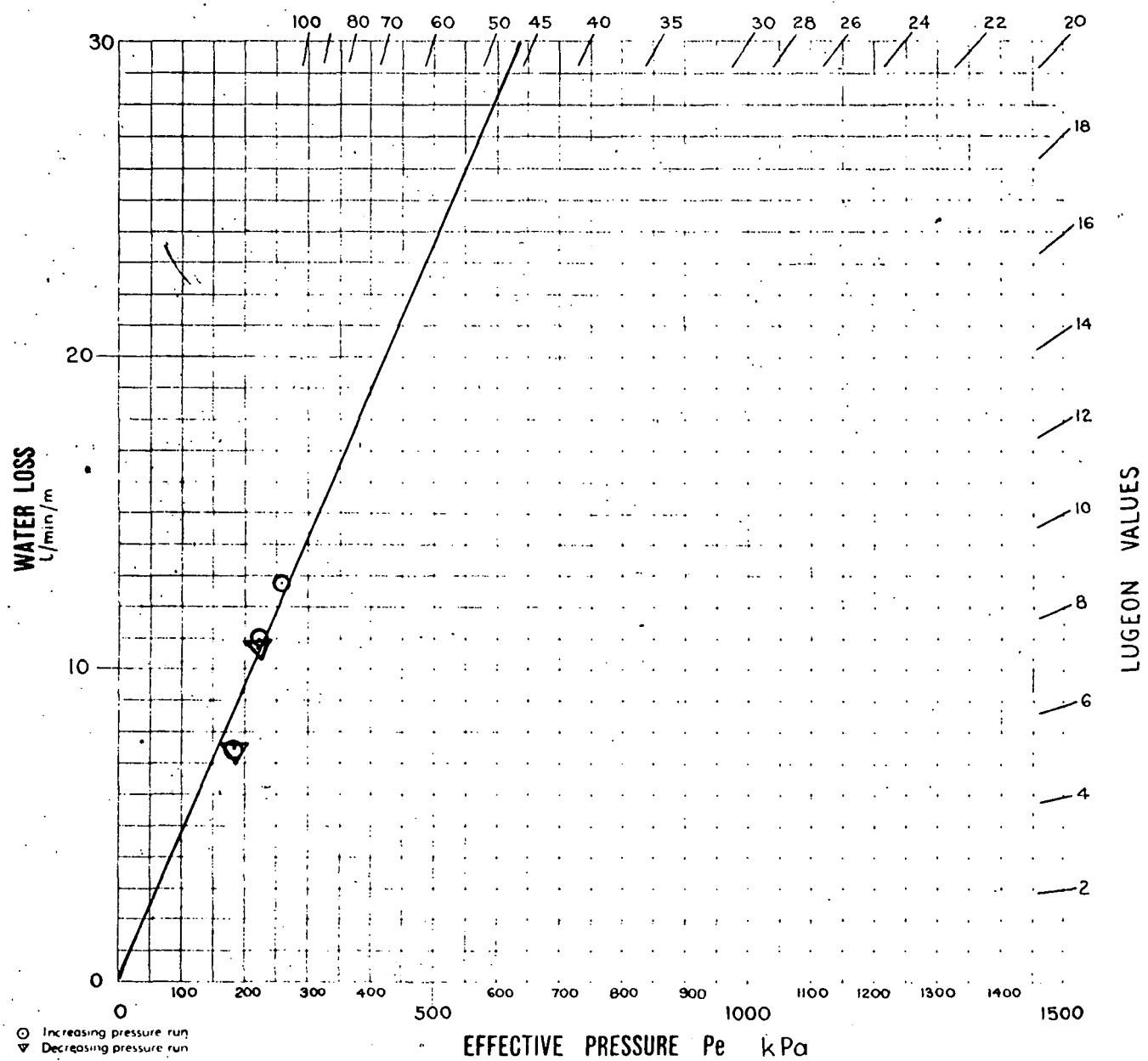
WATER PRESSURE TEST · DIAMOND DRILL HOLE

HOLE DH2

SECTION TESTED
From 46·60 m
To 50·0 m
Main Depth m

PROJECT BAROSSA DAM
FEATURE FOUNDATIONS
LOCATION BAROSSA VALLEY

CO-ORDINATES
ANGLE FROM HORIZONTAL 60° (Sine 0·866) DIRECTION 225°
R.L. Collar metres Datum



Slope height of pressure gauge above collar 0·50 m

Groundwater level at beginning of shift 8·80 m

Length of test section 3·40 m

WATER COLUMN CORRECTION
Slope height of water column above groundwater level
Below collar 8·80 m
Below pressure gauge. Hw 9·30 m
Extra pressure due to head of water column, Pw .79 kPa

GAUGE PRESSURE Pg lb/in²	Pc kPa*	WATER LOSS gall/min	L/min	L/min/m	SUPPLY LINE CORRECTION Pc kPa	EFFECTIVE PRESSURE Pe kPa
20	138	5·6	25·48	7·49	33·5	183·5
30	207	8·24	37·49	11·03	67·5	218·5
40	276	9·6	43·68	12·85	90	265
30	207	8·2	37·31	10·97	67	219
20	138	5·6	25·48	7·49	33·5	183·5

PACKER TYPE HYDRAULIC

Date of Test 26·6·73
Test by J. Jensen
Calc by G. Taylor
Checked
Drg. No S10529n

Pw = Hw sin θ x 9·81
Pe = Pc + Pw − Pe
For general layout of water pressure tests see Drg No S 10 006
Ps is obtained from Drg No 10 006
* 100 kPa (kilopascal) = 1 bar

100 LUGEON PF S10020 MB IMPERIAL – METRIC

APPENDIX III

Photographs of Dam Wall Cracks and Drill Core

BAROSSA 23891

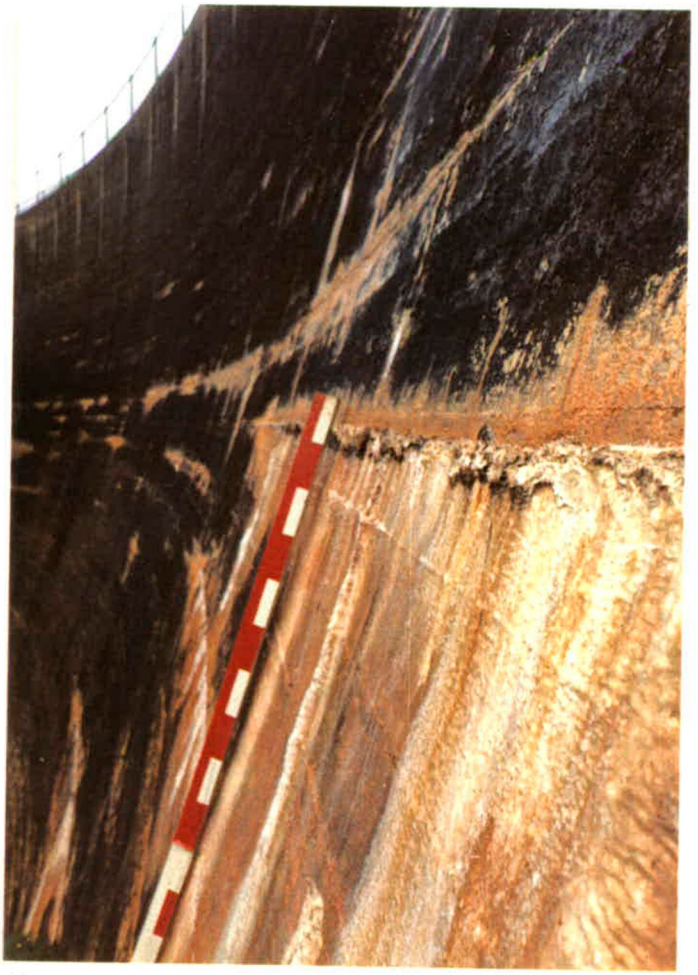
1. General view of dam wall (left Abutment)

BAROSSA 23892

2. Closeup of vertical crack.

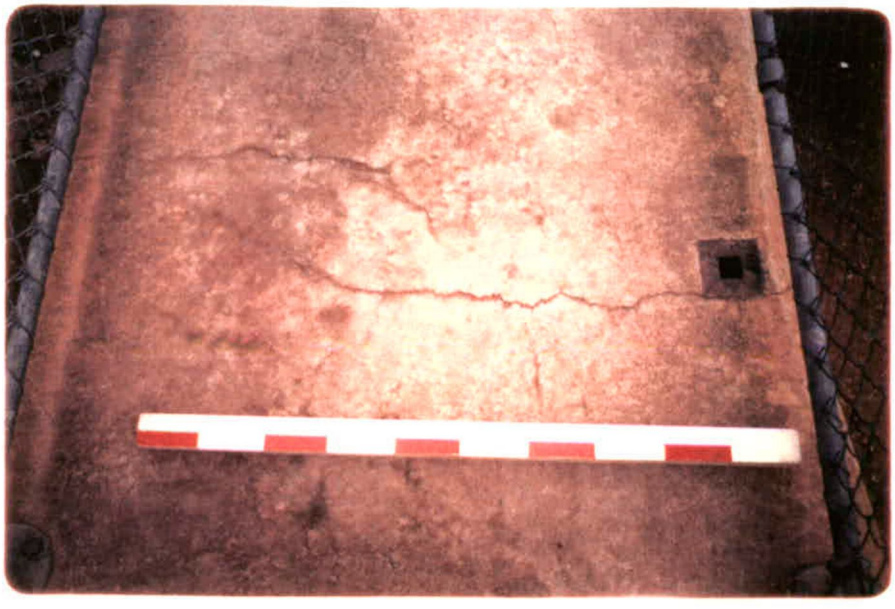
BAROSSA 23889

3. Closeup of "day plane" crack



BAROSSA 23890

4. Side view shows calcareous encrustation



YATALA 10040

5. Vertical crack along crest located near old handrail seating

BAROSSA

24194

BAROSSA

24195

BAROSSA

24196

BAROSSA

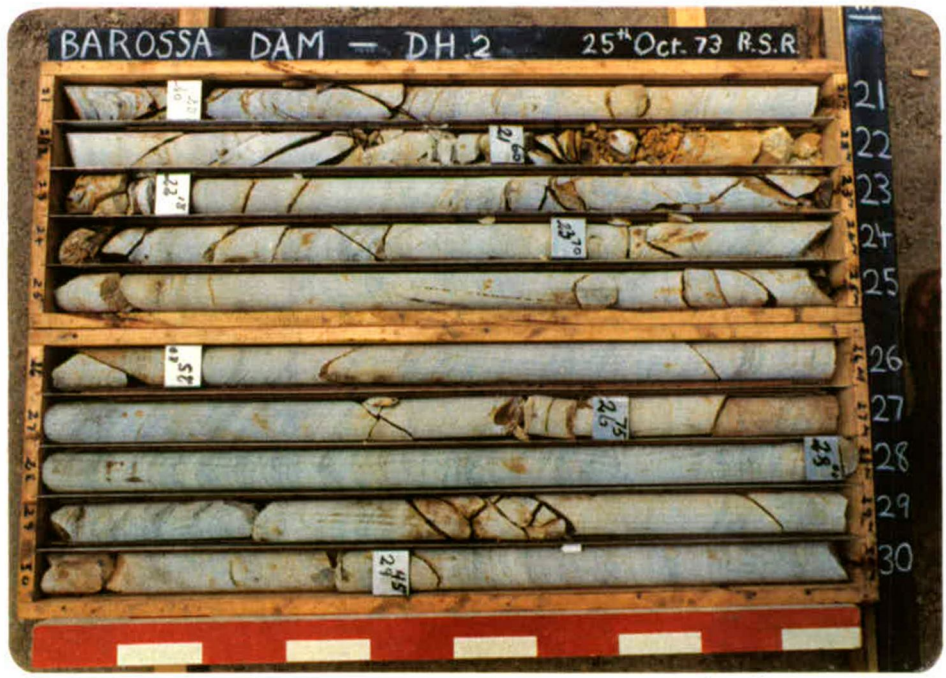
24197

BAROSSA

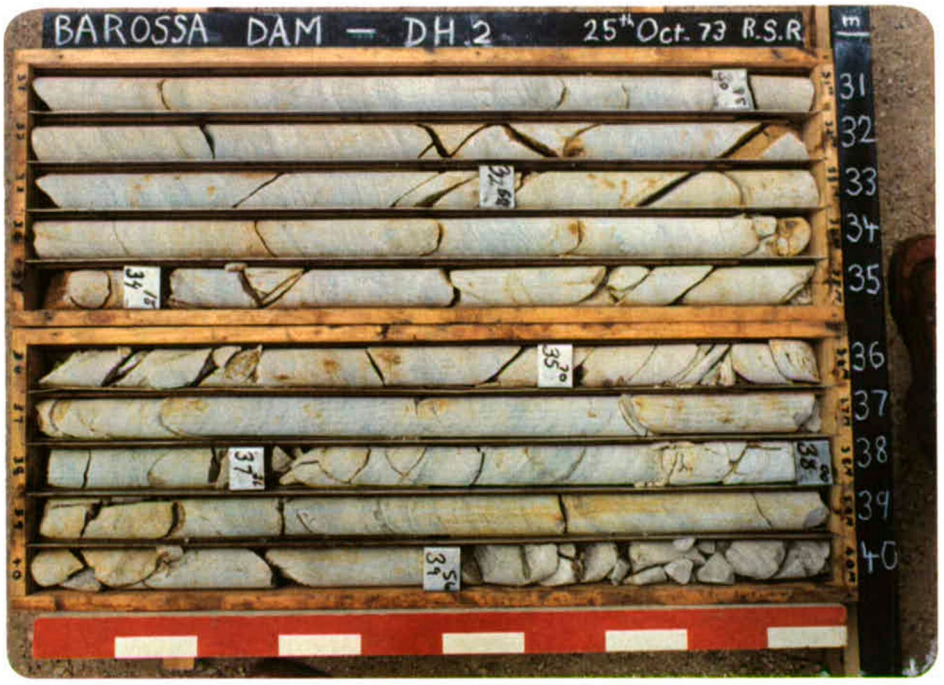
24198

BAROSSA 24189

BAROSSA 24190



BAROSSA 24191



BAROSSA.

24192

BAROSSA.

24193

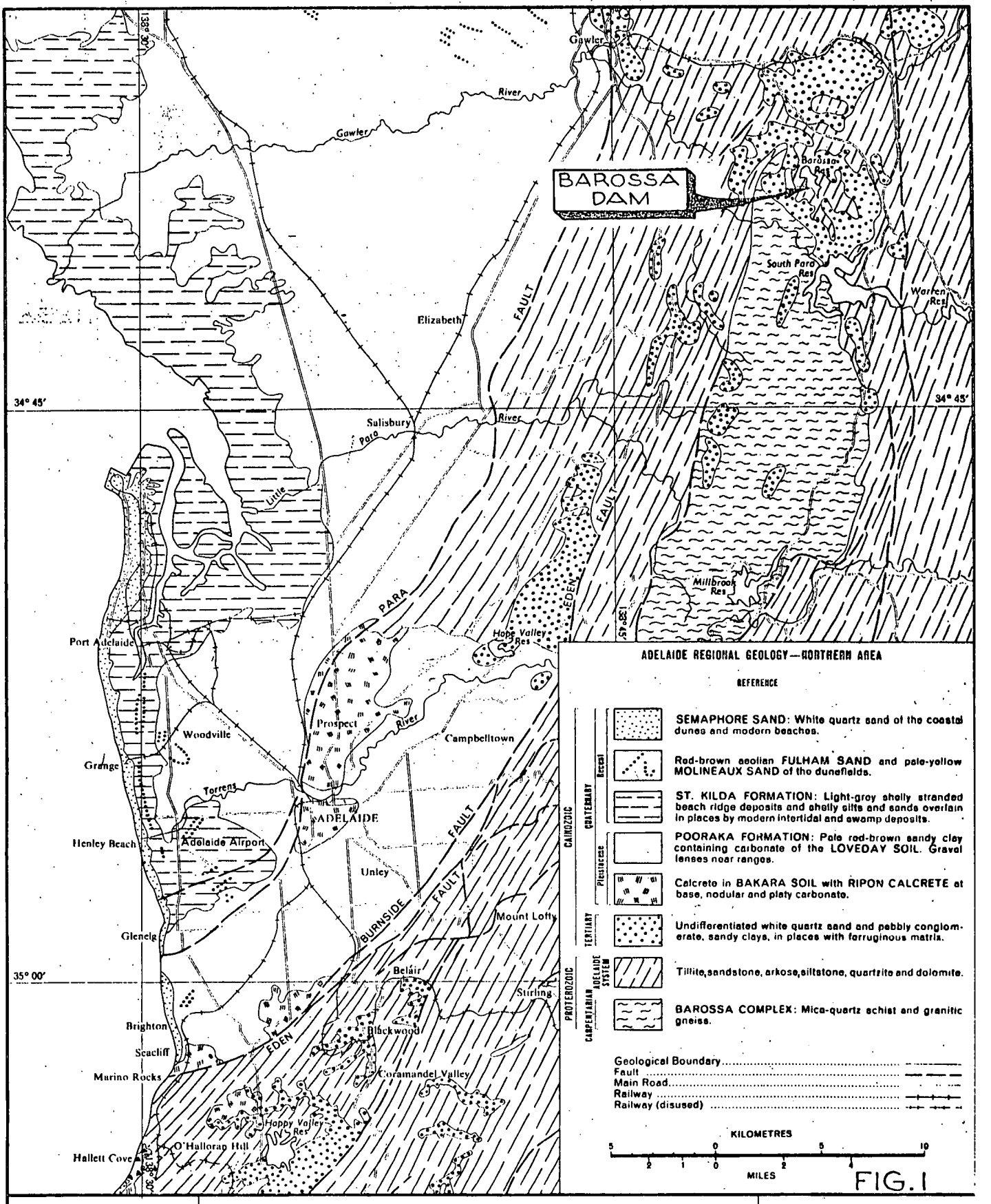
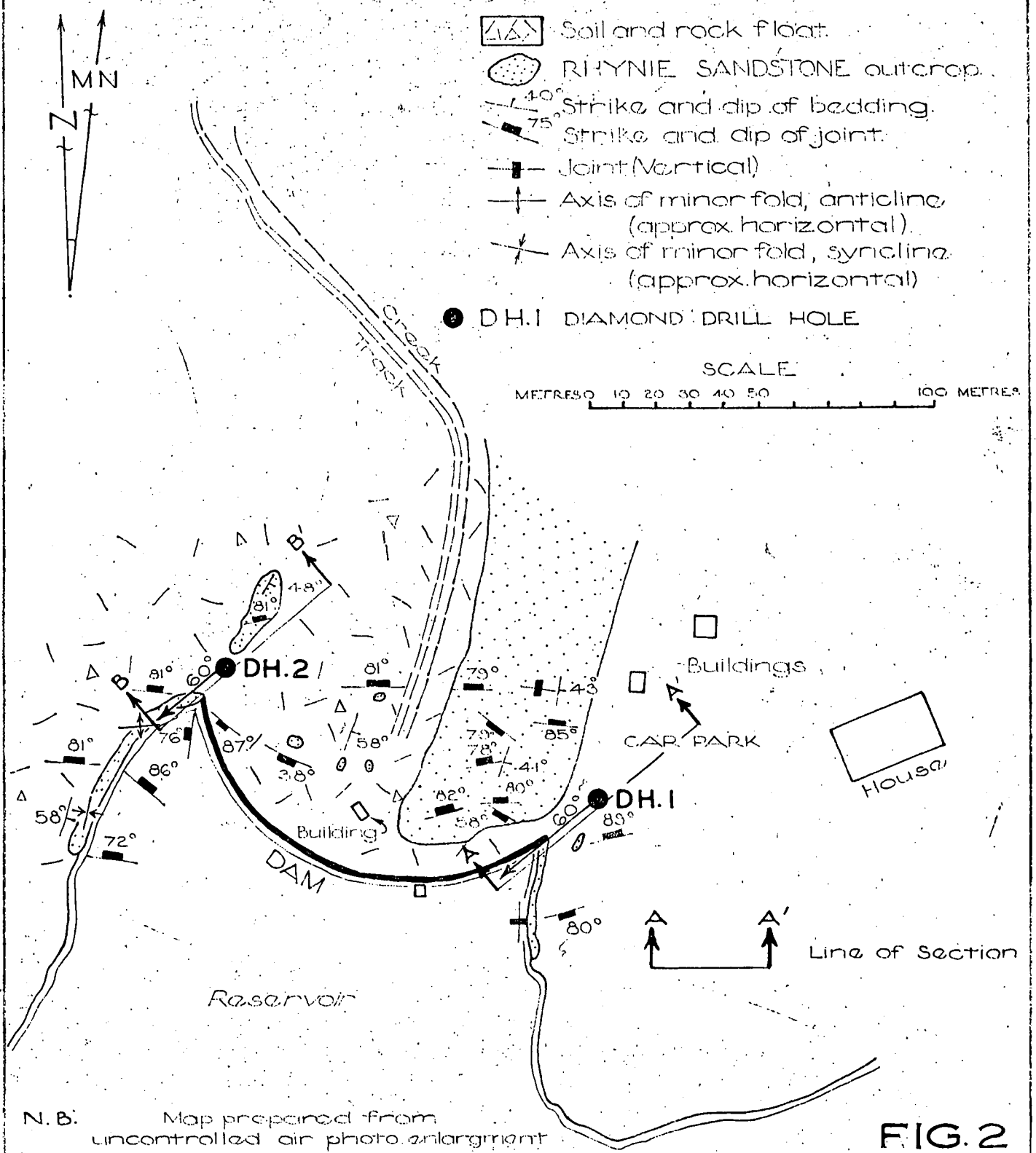


FIG. 1

ENGINEERING GEOLOGY SECTION	**DEPARTMENT OF MINES—SOUTH AUSTRALIA**	Scale: 1:250 000
Compiled: J.S.		Date: 15 Aug. 1973
Drn. R.B. | Ckd. A.F.	# BAROSSA DAM ## LOCATION AND REGIONAL GEOLOGY	Drg. No. S10443 Ha3
Geology from Adelaide and Barker 1:250 000 Geological Atlas Series		

PF No S9992 GH

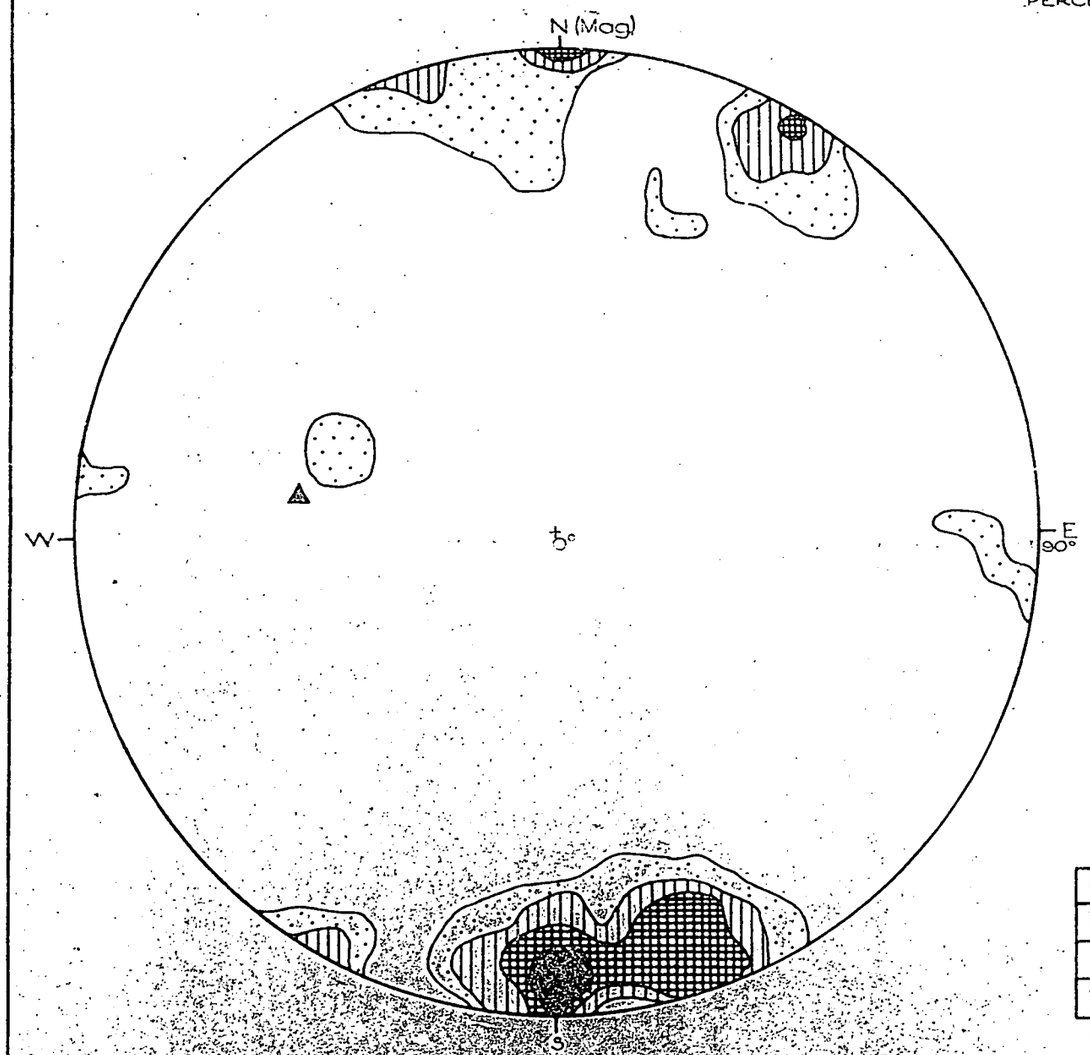


N.B. Map prepared from uncontrolled air photo enlargment

FIG. 2

	DEPARTMENT OF MINES — SOUTH AUSTRALIA	Scale: 1/1600 Approx
Compiled: R.S.R.	BAROSSA DAM GEOLOGICAL MAP OF DAM SITE	Date: 15 Aug. 1973
Drn. R.B. Ckd. A.F.		Drg. No. S10444 Ha3

300—6.72. 65952



PERCENT OF POINTS

- >15%
- >10%
- >5%
- >2%

Summary of
ROCK DISCONTINUITIES

NO.	STRIKE	DIP	TYPE
1(A)	190°	45°E	BEDDING
2	090°	80°N	JOINT
3	120°	85°SW	JOINT

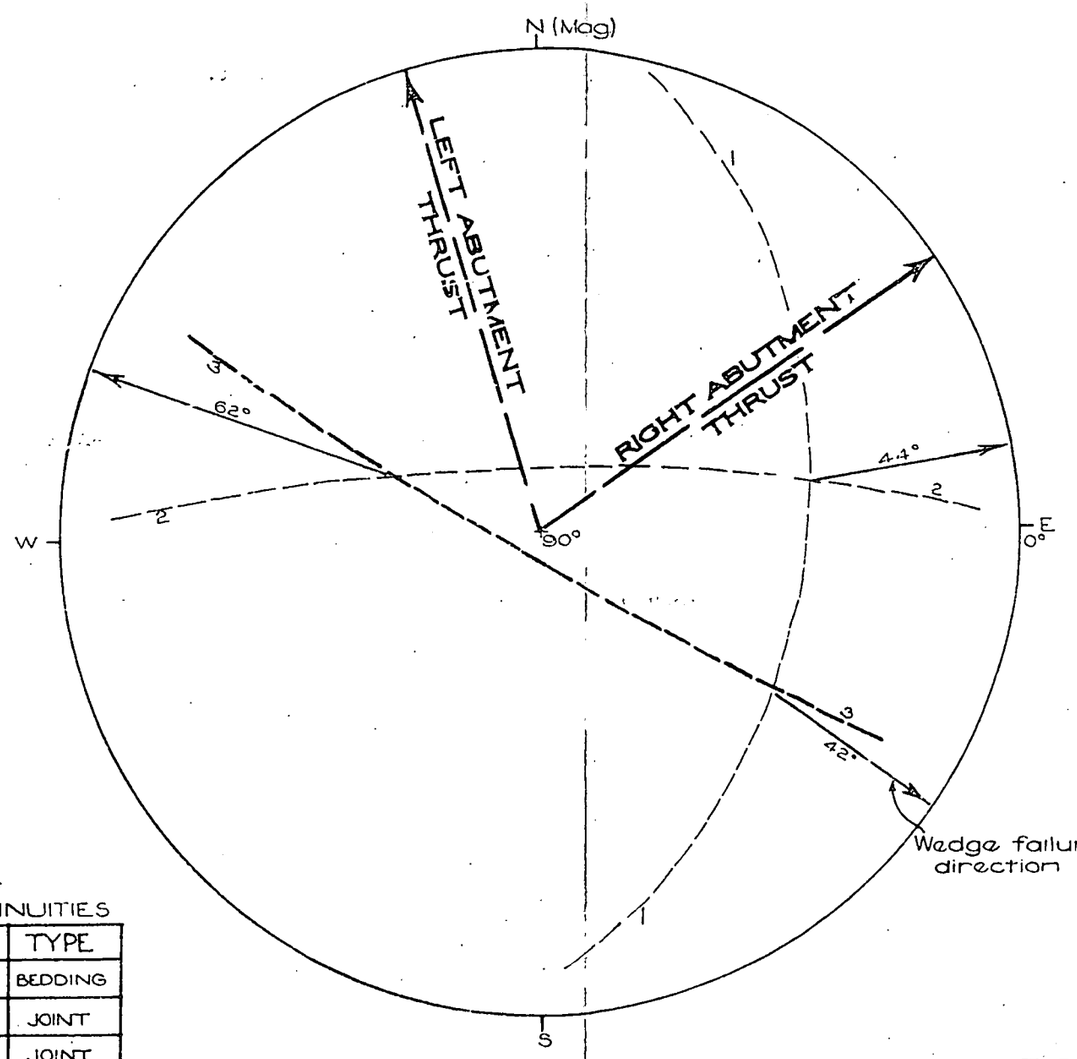
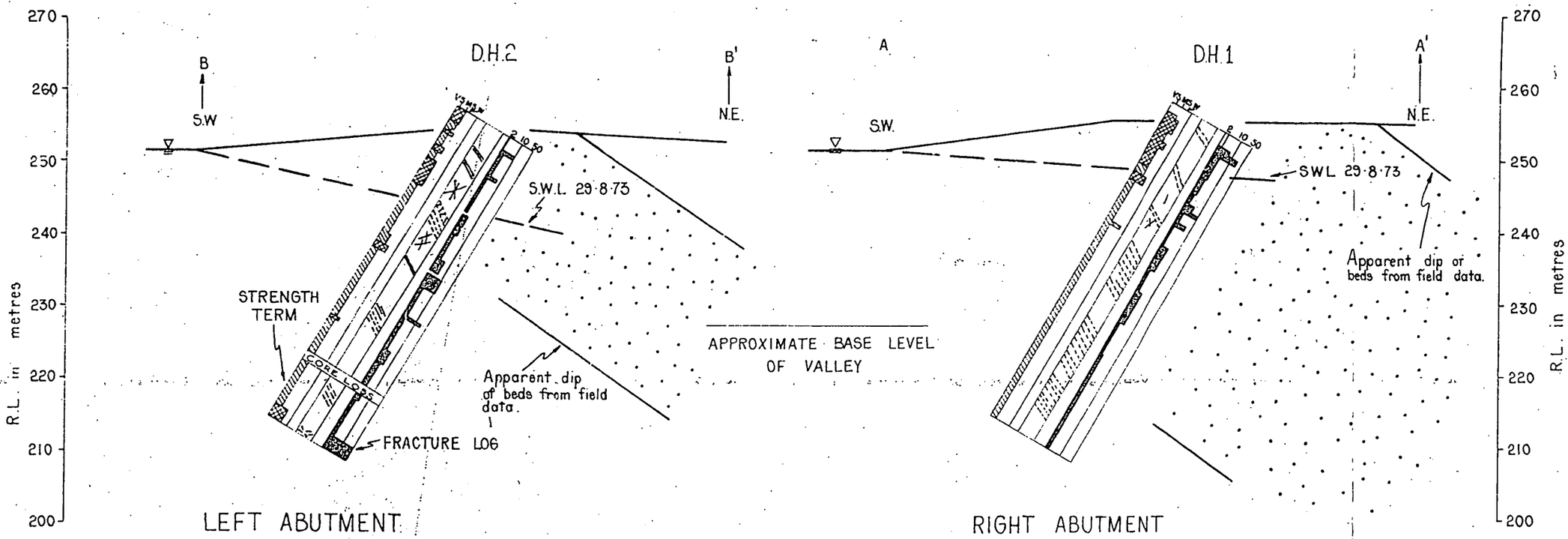


FIG.3

ENGINEERING GEOLOGY	DEPARTMENT OF MINES – SOUTH AUSTRALIA	Scale: Diagrammatic
Compiled J.S./R.S.R.	BAROSSA DAM	Date: 15 Aug 1973
Drn. R.B. | Ckd. A.F.	ROCK DISCONTINUITIES AROUND DAM WALL.	Drg. No. 73-566 Ha3



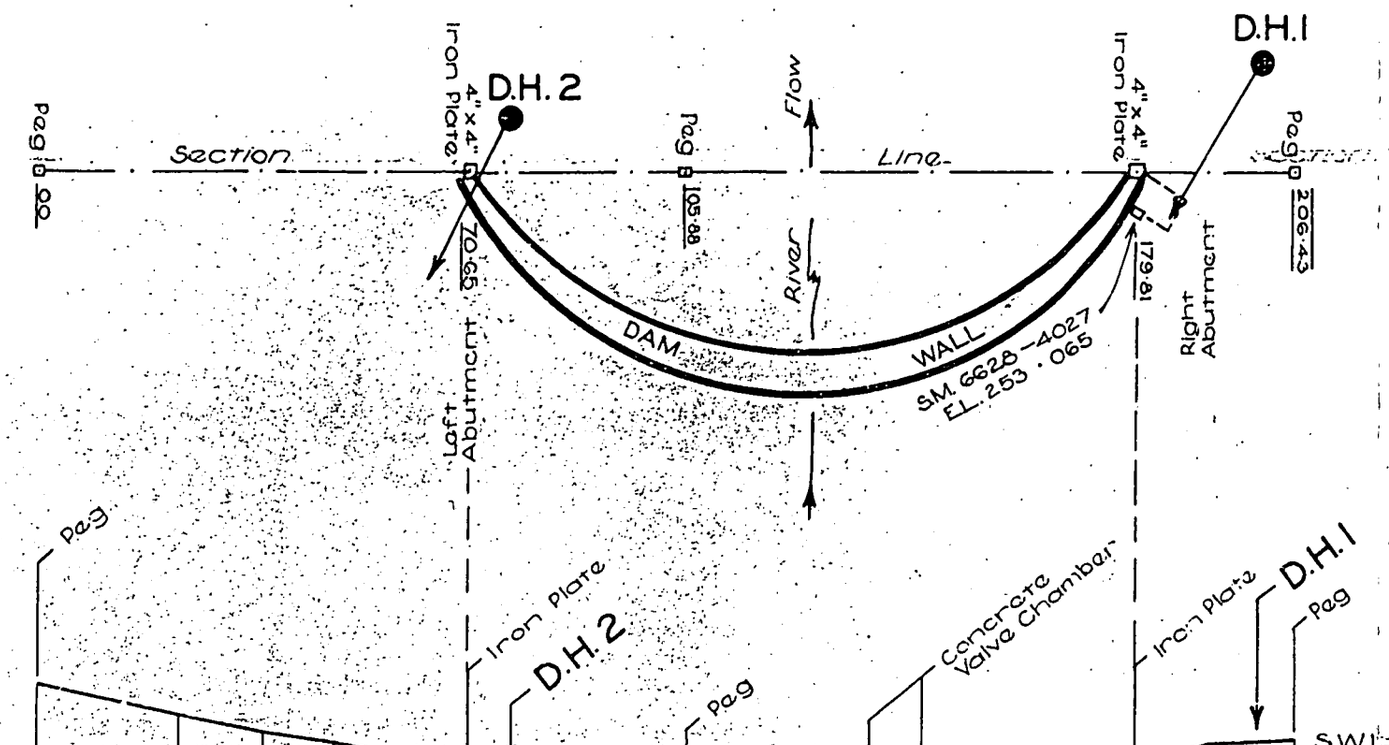
Note :- Strength term and fracture log are taken from geological log. (Appendix II)

FIG. 4

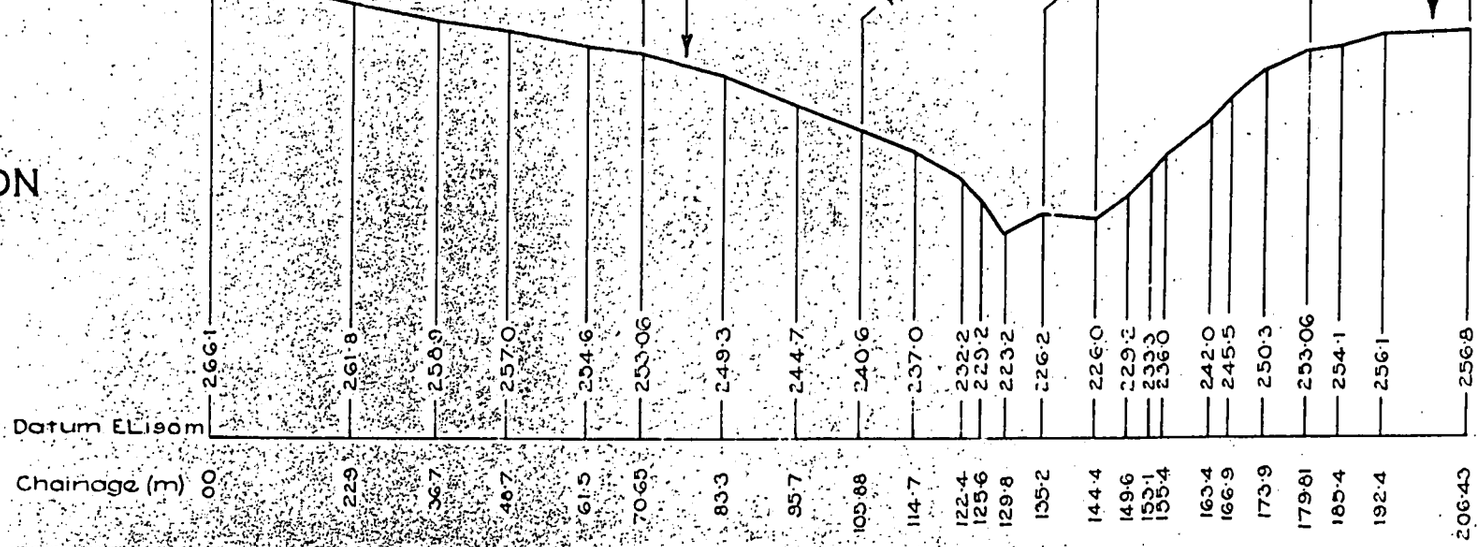
	DEPARTMENT OF MINES – SOUTH AUSTRALIA	Scale: 1 : 500
Compiled: J. Selby	BAROSSA DAM	Date: 1 October '73
Drn. B.D.W. Ckd. A.F.	GEOLOGICAL SECTIONS	Drg. No. 73-689 Ha3

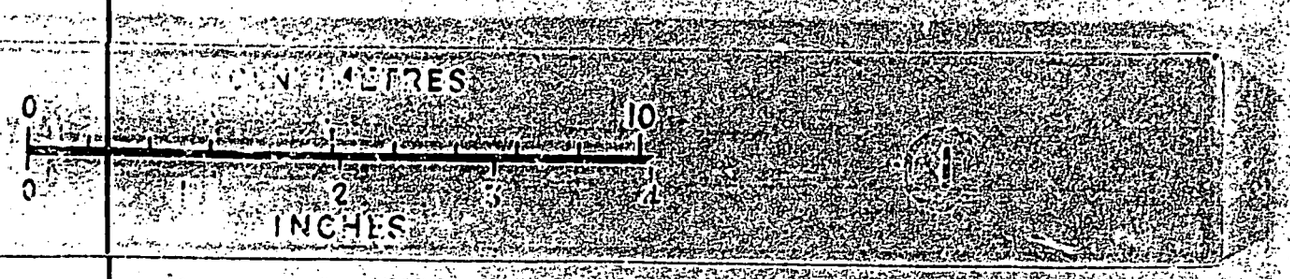
BAROSSA RESERVOIR

PLAN



SECTION





SCALE

METRES 10 0 10 20 30 40 50 METRES

E & W.S. Dept. Drg. No. 3496/73, SB. 15/73 FIG. 5

DEPARTMENT OF MINES — SOUTH AUSTRALIA

BAROSSA DAM

TOPOGRAPHIC CROSS SECTION OF VALLEY

ENGINEERING GEOLOGY SECTION	GEOLOGIST	Drn. J.S.	SCALE: 1:1000
		Tcd. R.B.	73–649 Ha3
Director of Mines		Ckd. A.F.	
		Exd.	DATE: 17 Sept. 1973