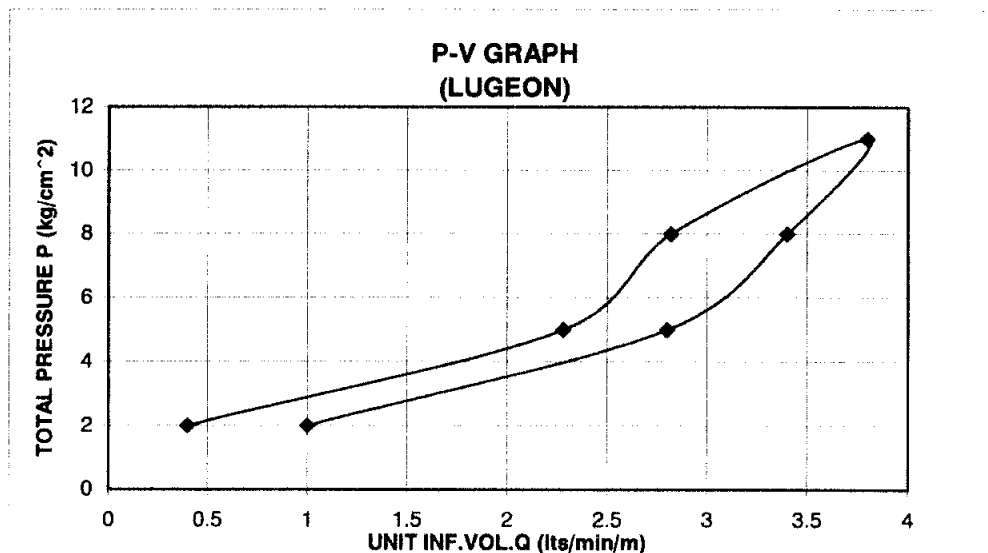


WATER PRESSURE TEST				
PROJECT: KULEKANI III HYDROPOWER PROJECT		Sheet 6 of 9		
DRILL HOLE NO: BD-4		TEST INTERVAL: 33.0 to 38.0 m		
WATER LEVEL: 9.50 m		GAUGE HEIGHT: 0.55 m		
HOLE DIAMETER: 66 mm		TEST LENGTH: 5.0 m		
PACKER TYPE: MECHANICAL SINGLE		HOLE INCLINATION: VERTICAL		
LUGEON VALUE: 3.40 lt/min/m/Mpa				
PRESSURE AT MANOMETER Po(Kg/cm^2)	TOTAL PRESSURE P=Po+H (kg/cm^2)	AVERAGE INFILTRATION VOLUME V, (l/min)	UNIT INFILTRATION VOLUME Q(l/min/m)	CONVERTED LUGEON VALUE (LU)
1	2.01	5.00	1.0	4.99
4	5.01	14.00	2.80	5.59
7	8.01	17.00	3.40	4.25
10	11.01	19.00	3.80	3.45
7	8.01	14.10	2.82	3.52
4	5.01	11.40	2.28	4.56
1	2.01	2.00	0.40	2.00

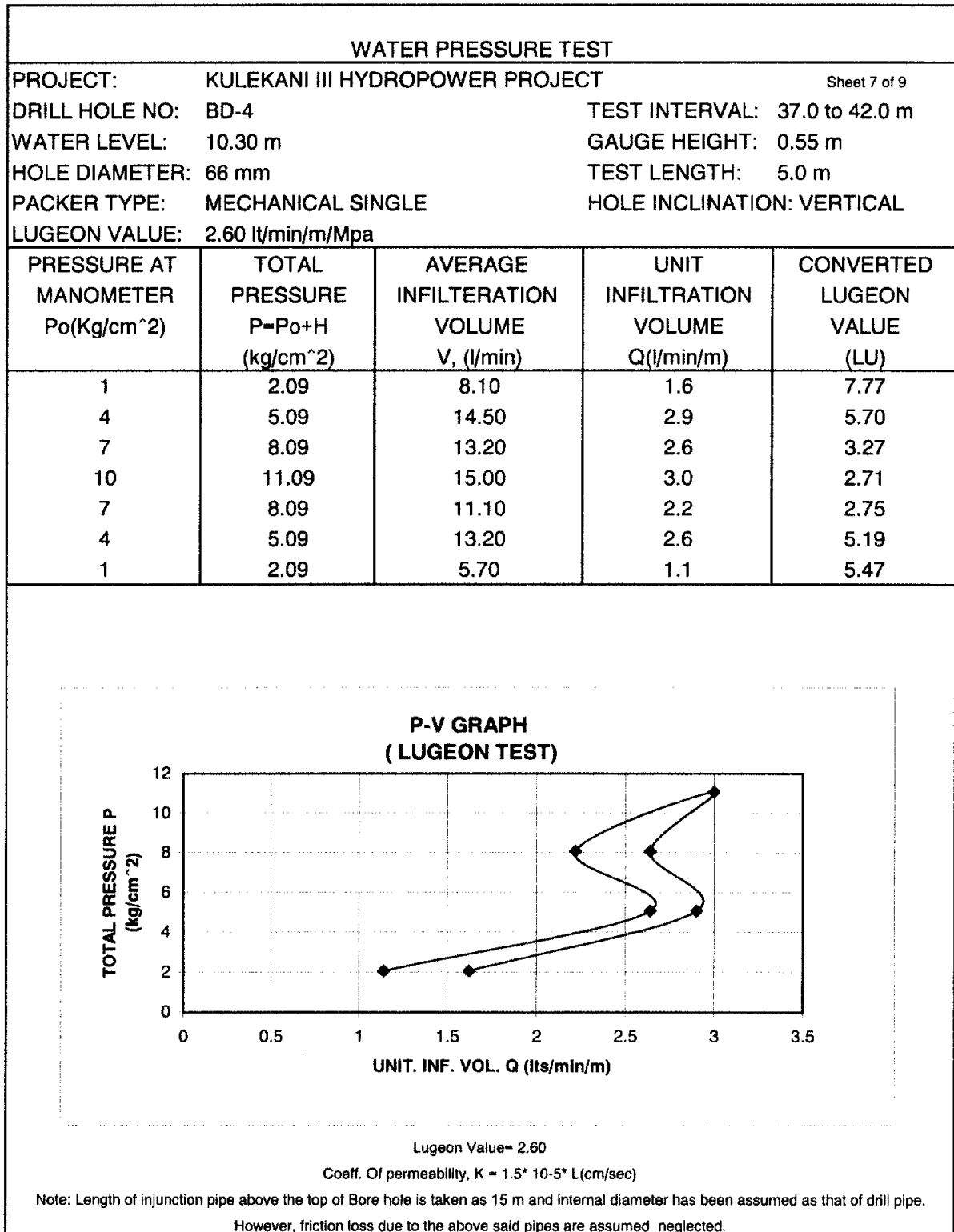


Lugeon Value= 3.4

Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L(cm/sec)}$

Note: Length of injection pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

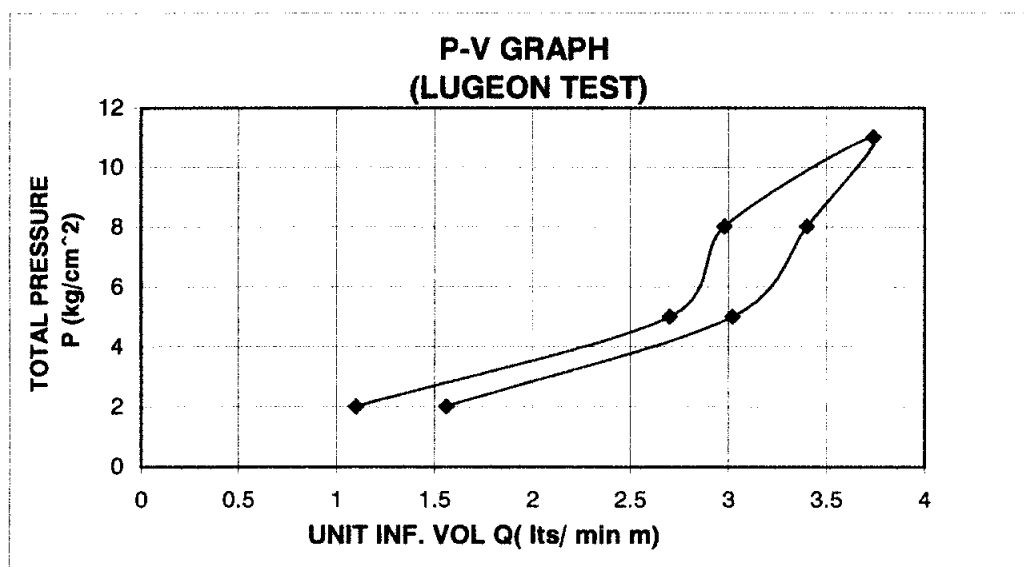
However, friction loss due to the above said pipes are assumed neglected.



### WATER PRESSURE TEST

<b>PROJECT:</b>	KULEKANI III HYDROPOWER PROJECT	Sheet 8 of 9
<b>DRILL HOLE NO:</b>	BD-4	<b>TEST INTERVAL:</b> 41.0 to 46.0 m
<b>WATER LEVEL:</b>	9.7 m	<b>GAUGE HEIGHT:</b> 0.55 m
<b>HOLE DIAMETER:</b>	66 mm	<b>TEST LENGTH:</b> 5.0 m
<b>PACKER TYPE:</b>	MECHANICAL SINGLE	<b>HOLE INCLINATION:</b> VERTICAL
<b>LUGEON VALUE:</b>	3.40 lt/min/m/Mpa	

PRESSURE AT MANOMETER $P_o(\text{Kg/cm}^2)$	TOTAL PRESSURE $P=P_o+H$ ( $\text{kg/cm}^2$ )	AVERAGE INFILTRATION VOLUME $V, (\text{l/min})$	UNIT INFILTRATION VOLUME $Q(\text{l/min/m})$	CONVERTED LUGEON VALUE (LU)
1	2.03	7.80	1.6	7.70
4	5.03	15.10	3.0	6.01
7	8.03	17.00	3.4	4.24
10	11.03	18.70	3.7	3.39
7	8.03	14.90	3.0	3.71
4	5.03	13.50	2.7	5.37
1	2.03	5.50	1.1	5.43



Lugeon Value= 3.40

Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L(cm/sec)}$

Note: Length of injection pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

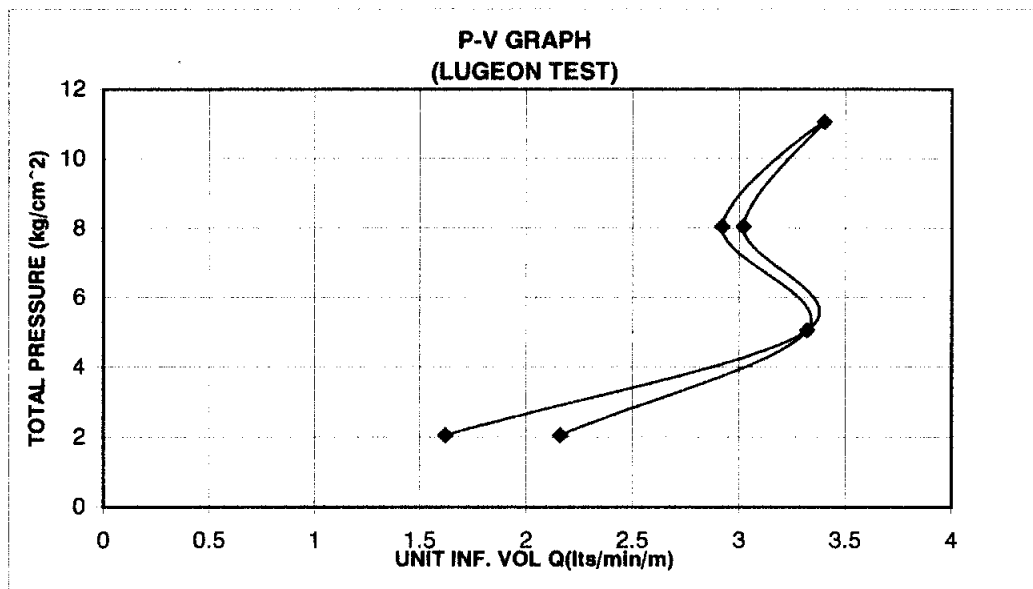
However, friction loss due to the above said pipes are assumed neglected.



### WATER PRESSURE TEST

PROJECT:	KULEKANI III HYDROPOWER PROJECT	Sheet 9 of 9
DRILL HOLE NO:	BD-4	TEST INTERVAL:
WATER LEVEL:	10.10 m	GAUGE HEIGHT:
HOLE DIAMETER:	66 mm	TEST LENGTH:
PACKER TYPE:	MECHANICAL SINGLE	HOLE INCLINATION:
LUGEON VALUE:	3.25 lt/min/m/Mpa	

PRESSURE AT MANOMETER $P_o(\text{Kg/cm}^2)$	TOTAL PRESSURE $P=P_o+H$ ( $\text{kg/cm}^2$ )	AVERAGE INFILTRATION VOLUME $V, (\text{l/min})$	UNIT INFILTRATION VOLUME $Q(\text{l/min/m})$	CONVERTED LUGEON VALUE (LU)
1	2.07	10.80	2.2	10.46
4	5.07	16.60	3.3	6.55
7	8.07	14.60	2.9	3.62
10	11.07	17.00	3.4	3.07
7	8.07	15.10	3.0	3.74
4	5.07	16.6	3.3	6.55
1	2.07	8.1	1.6	7.85

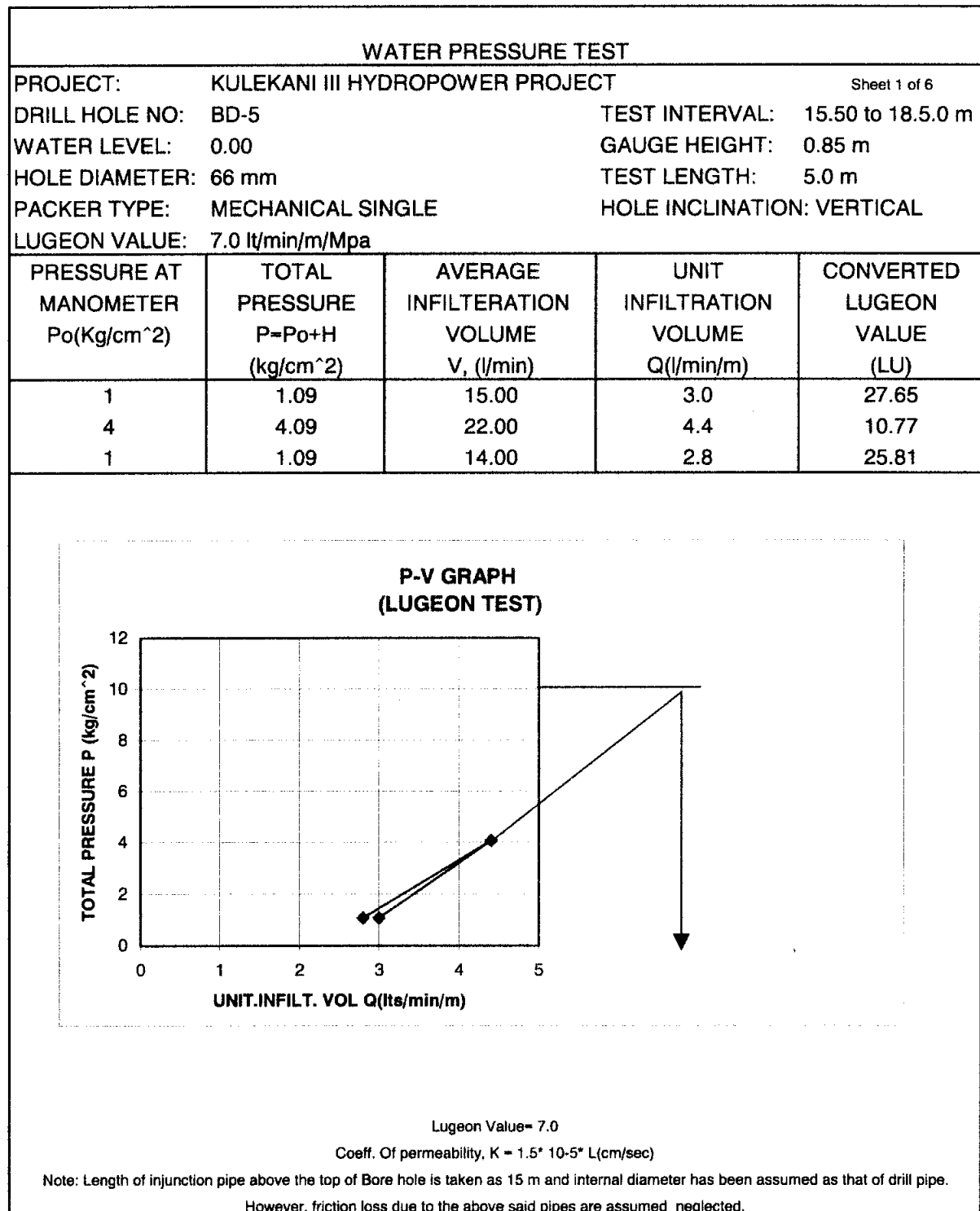


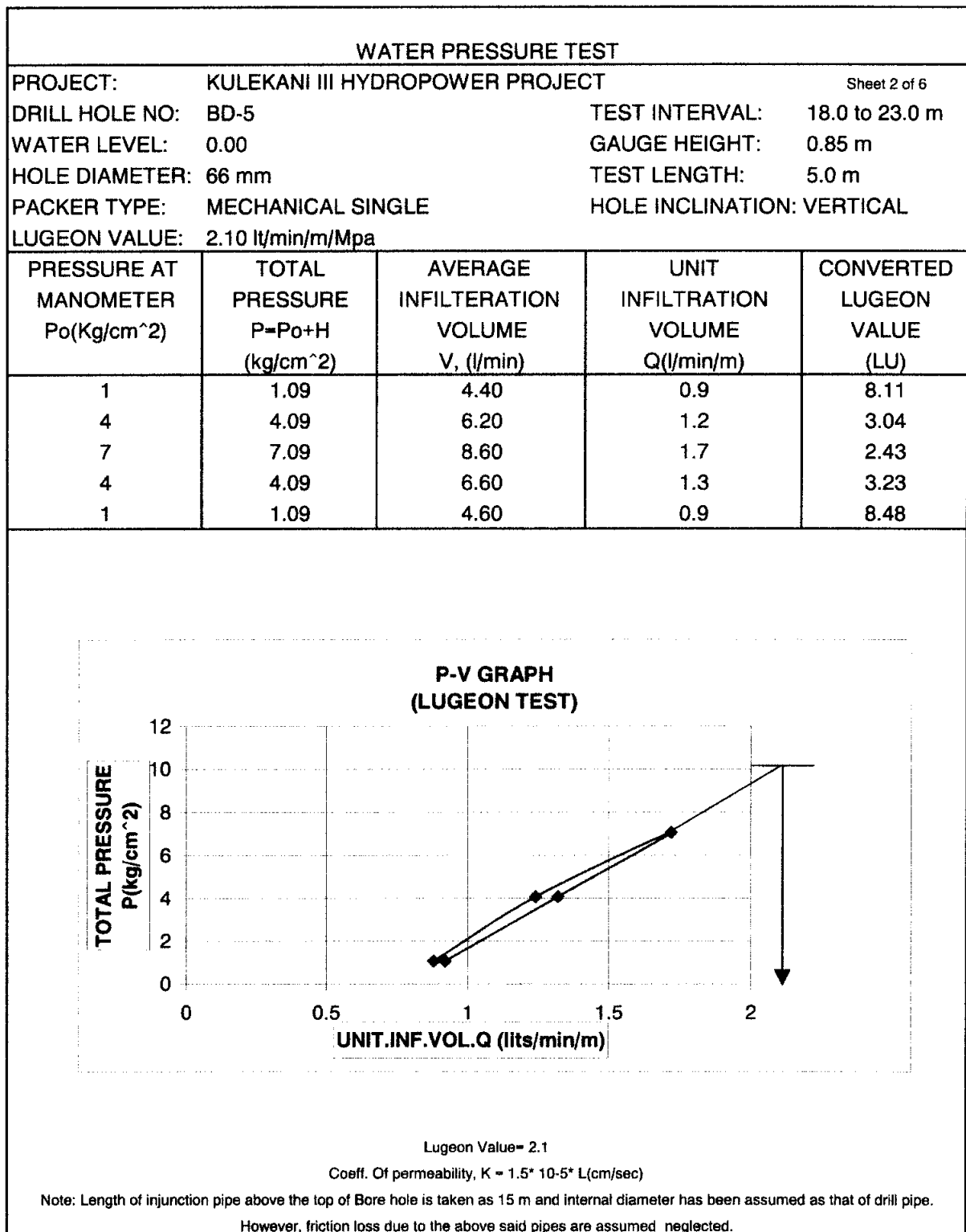
Lugeon Value= 3.25

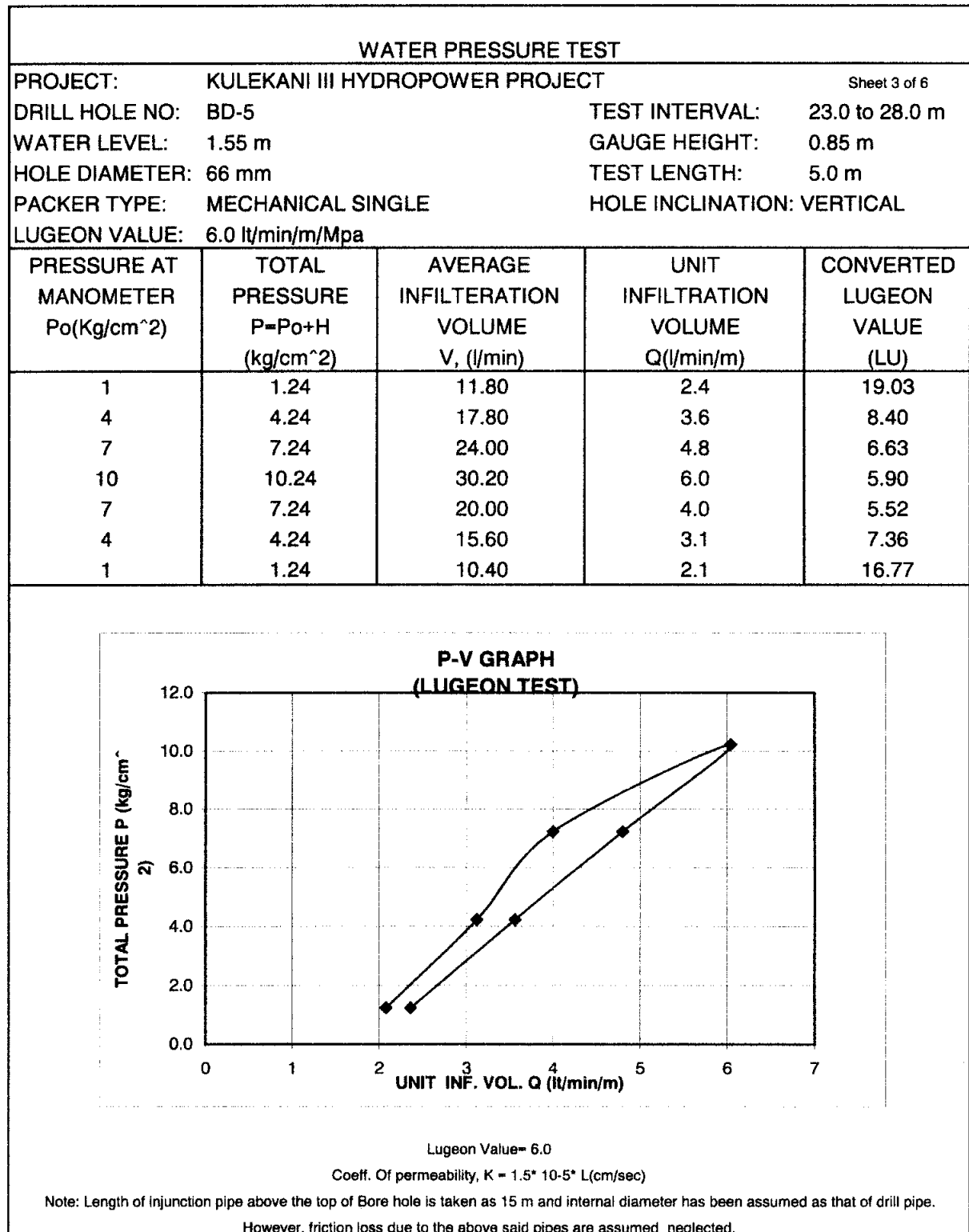
Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L(cm/sec)}$

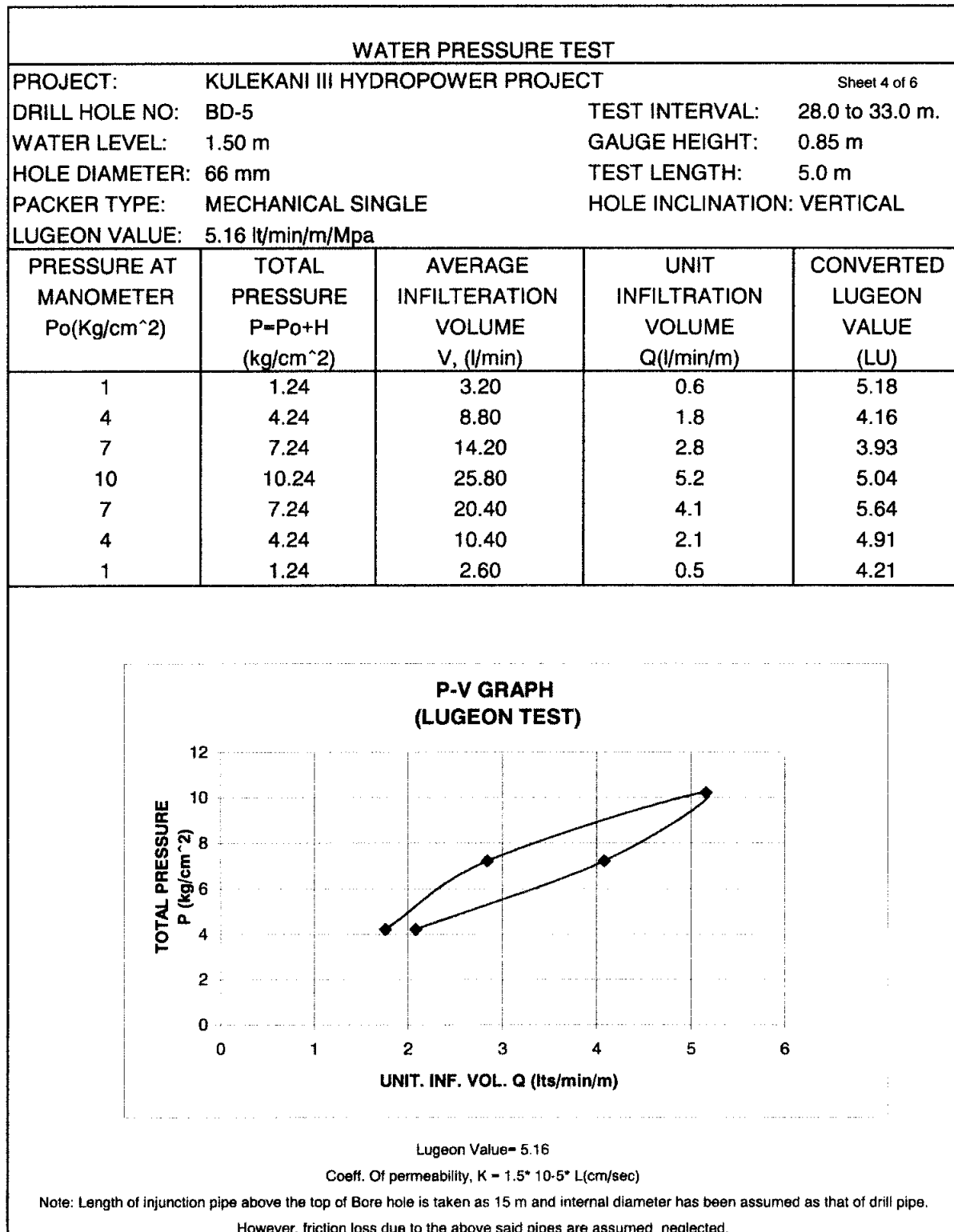
Note: Length of injuction pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

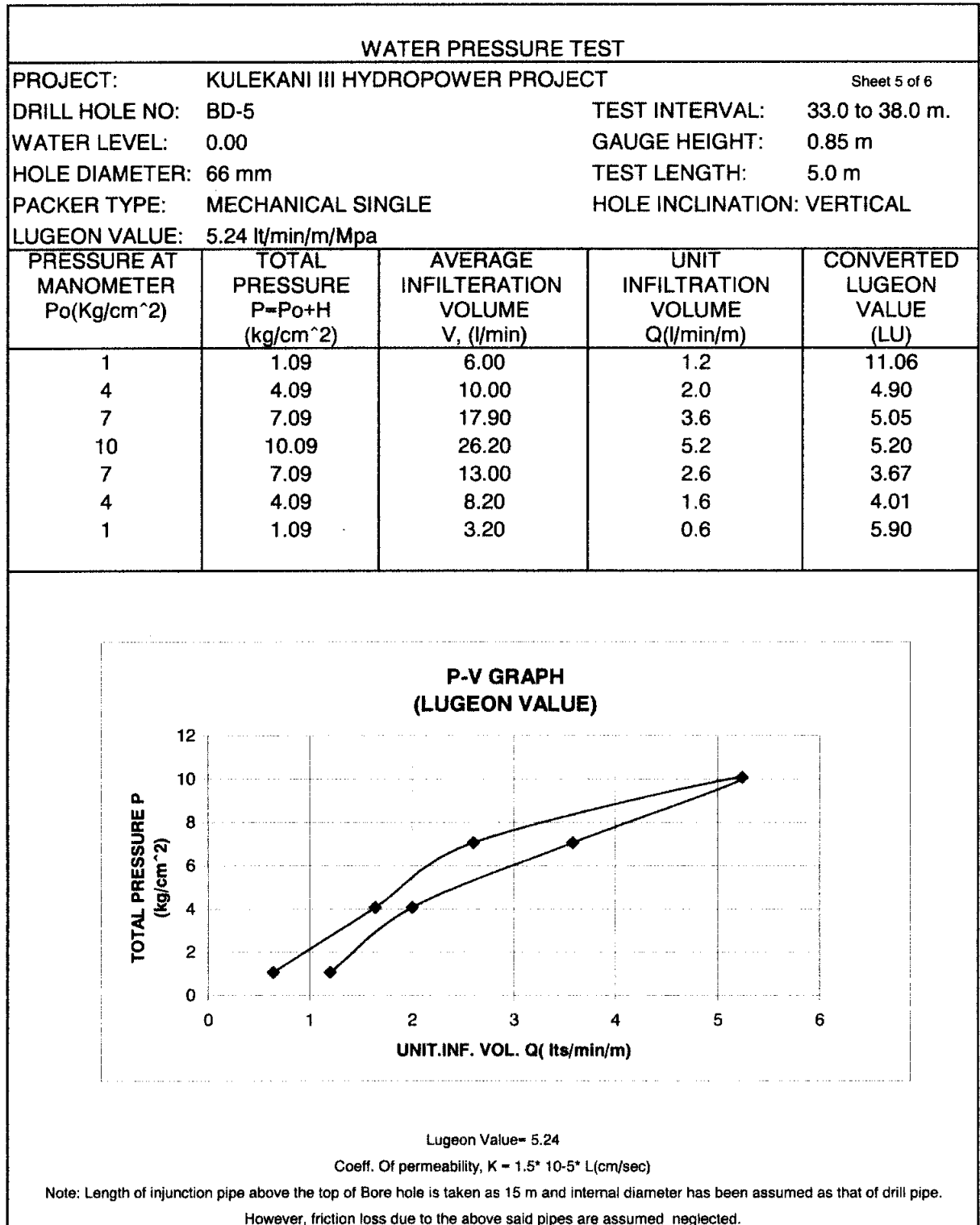
However, friction loss due to the above said pipes are assumed neglected.

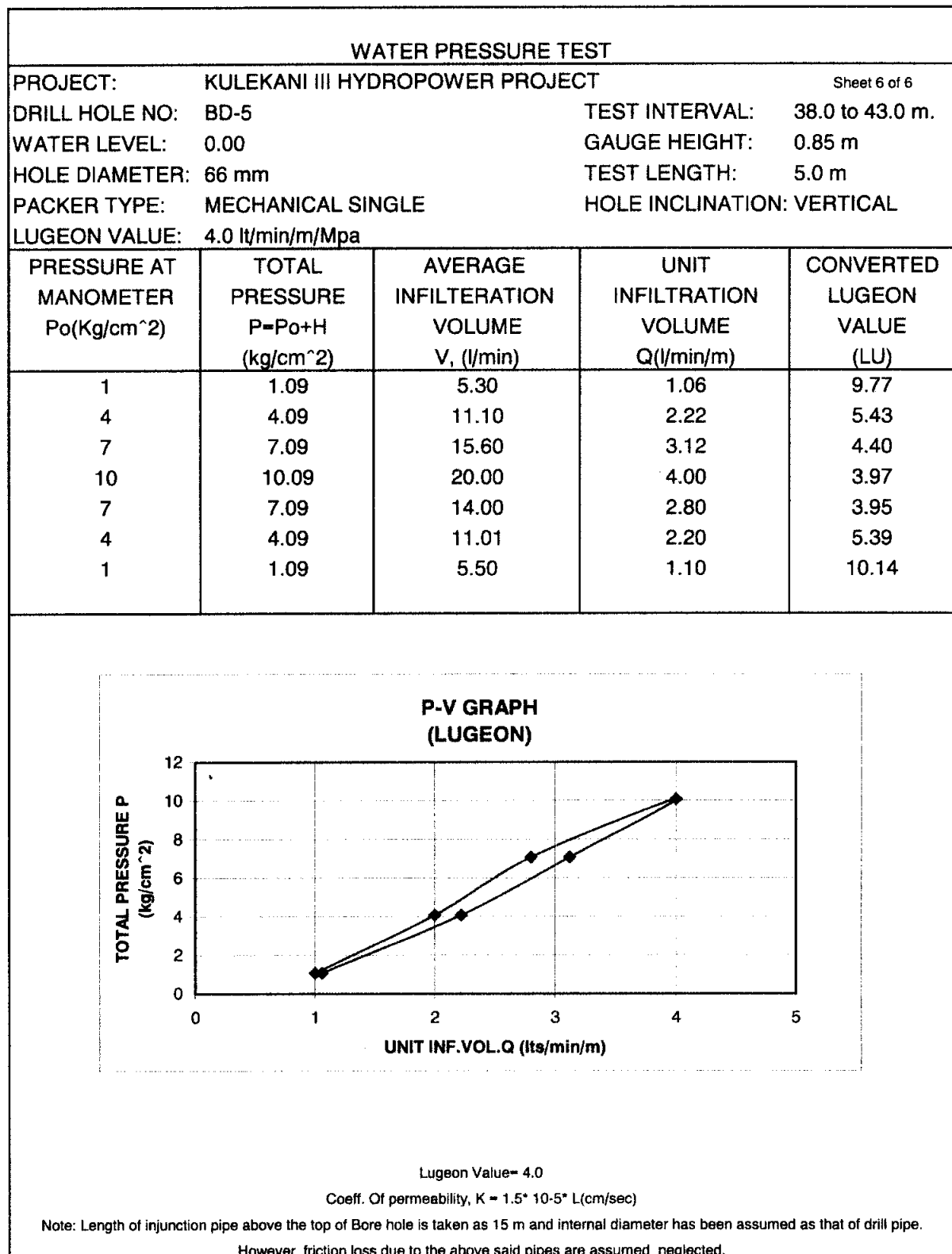


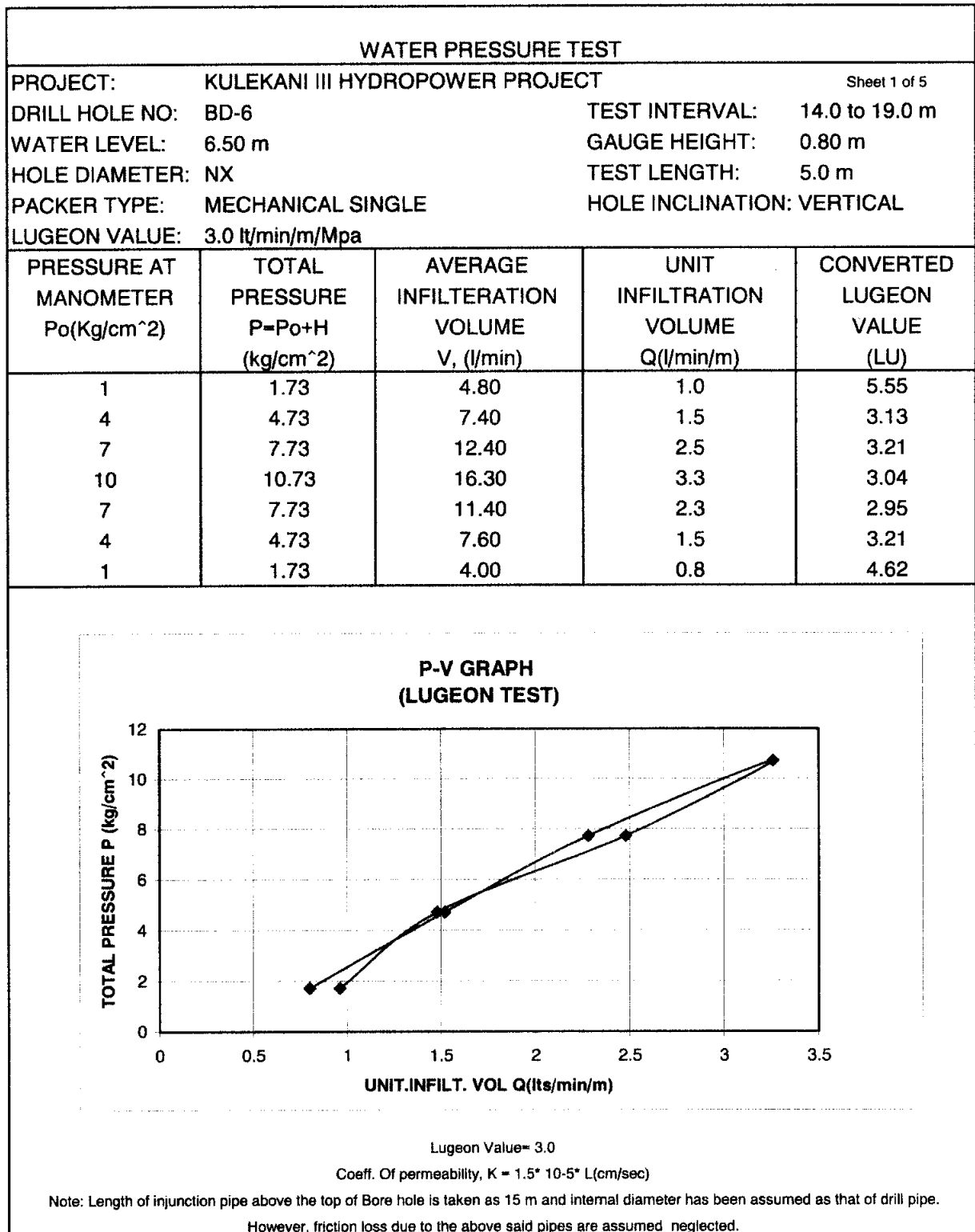




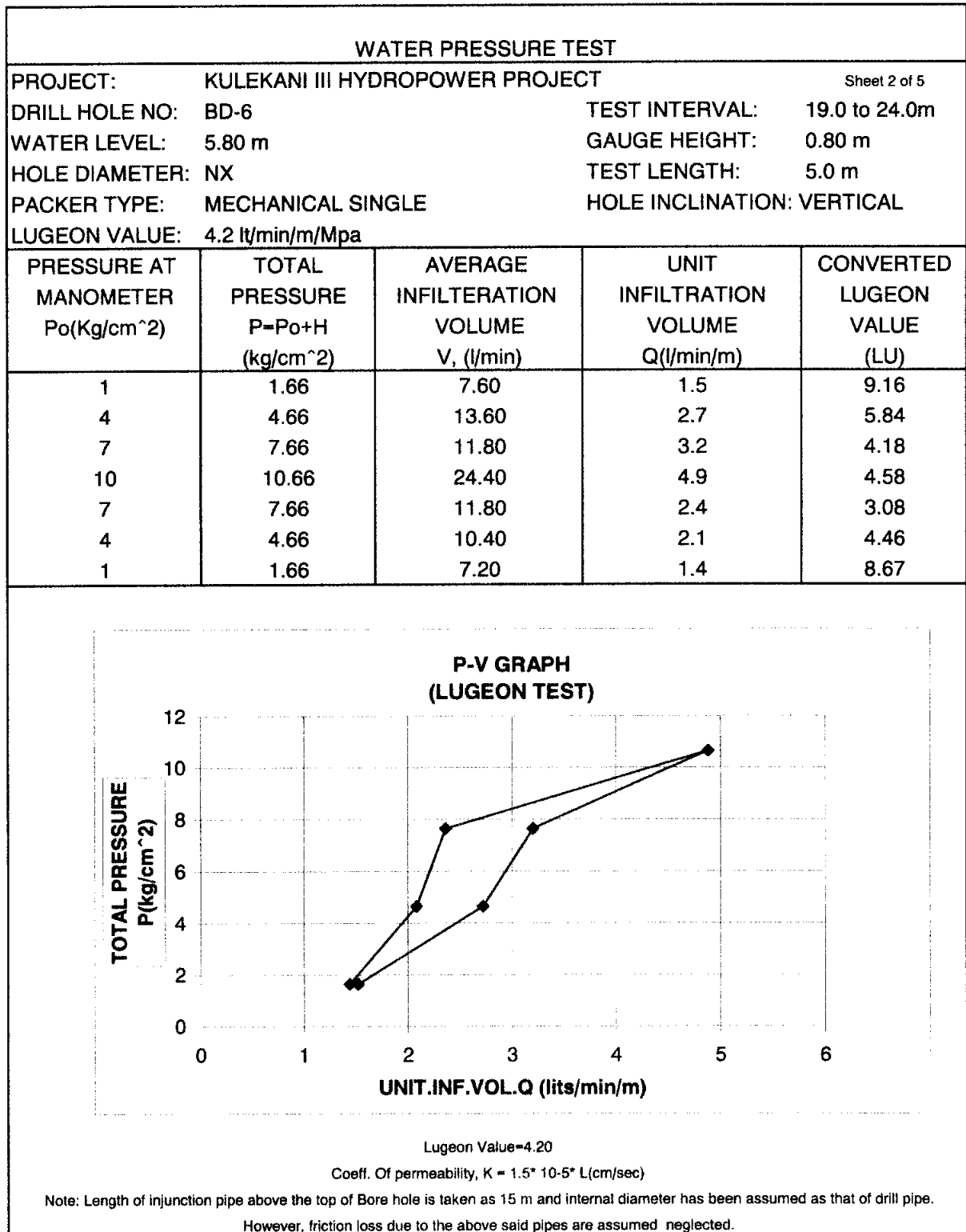


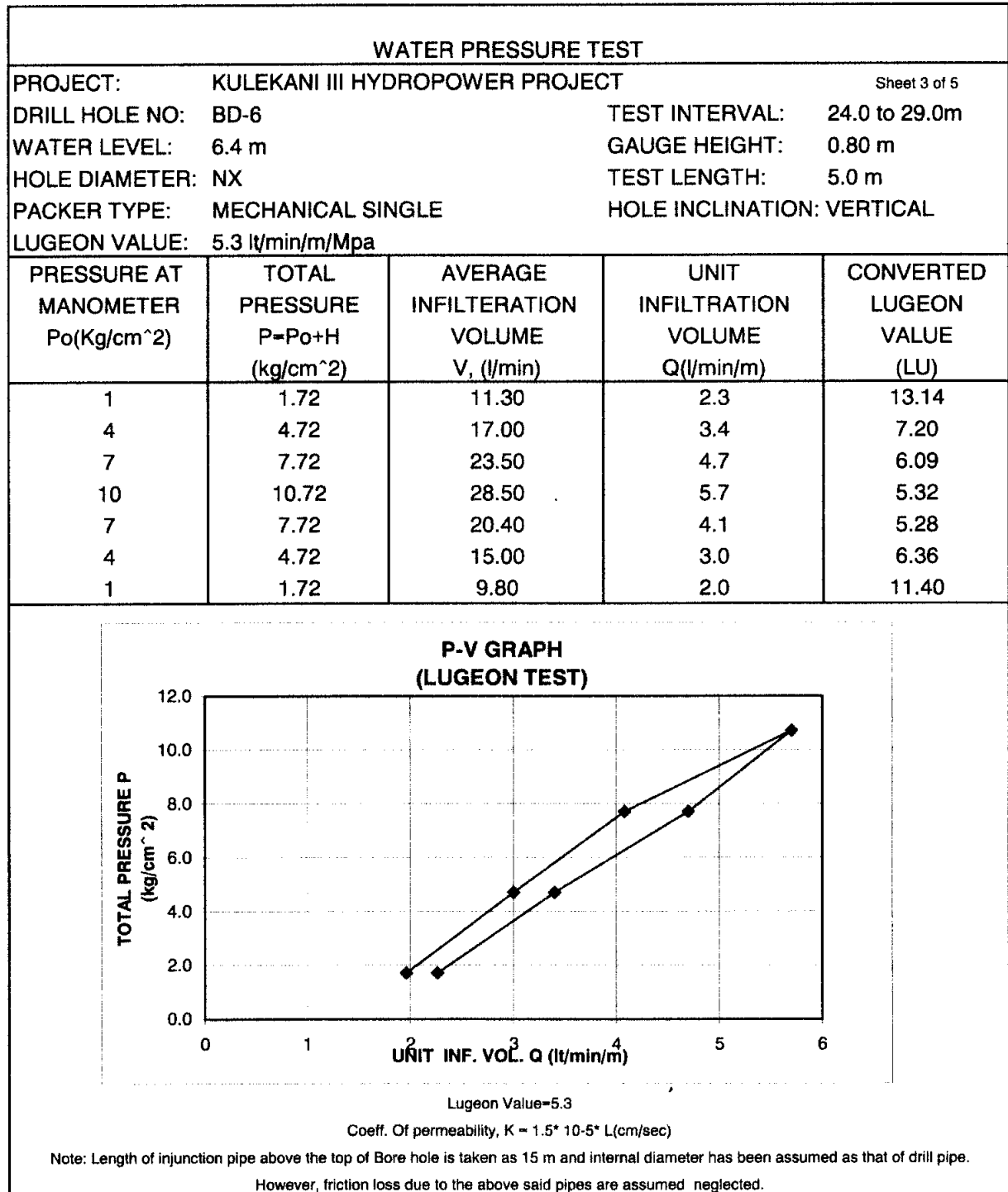


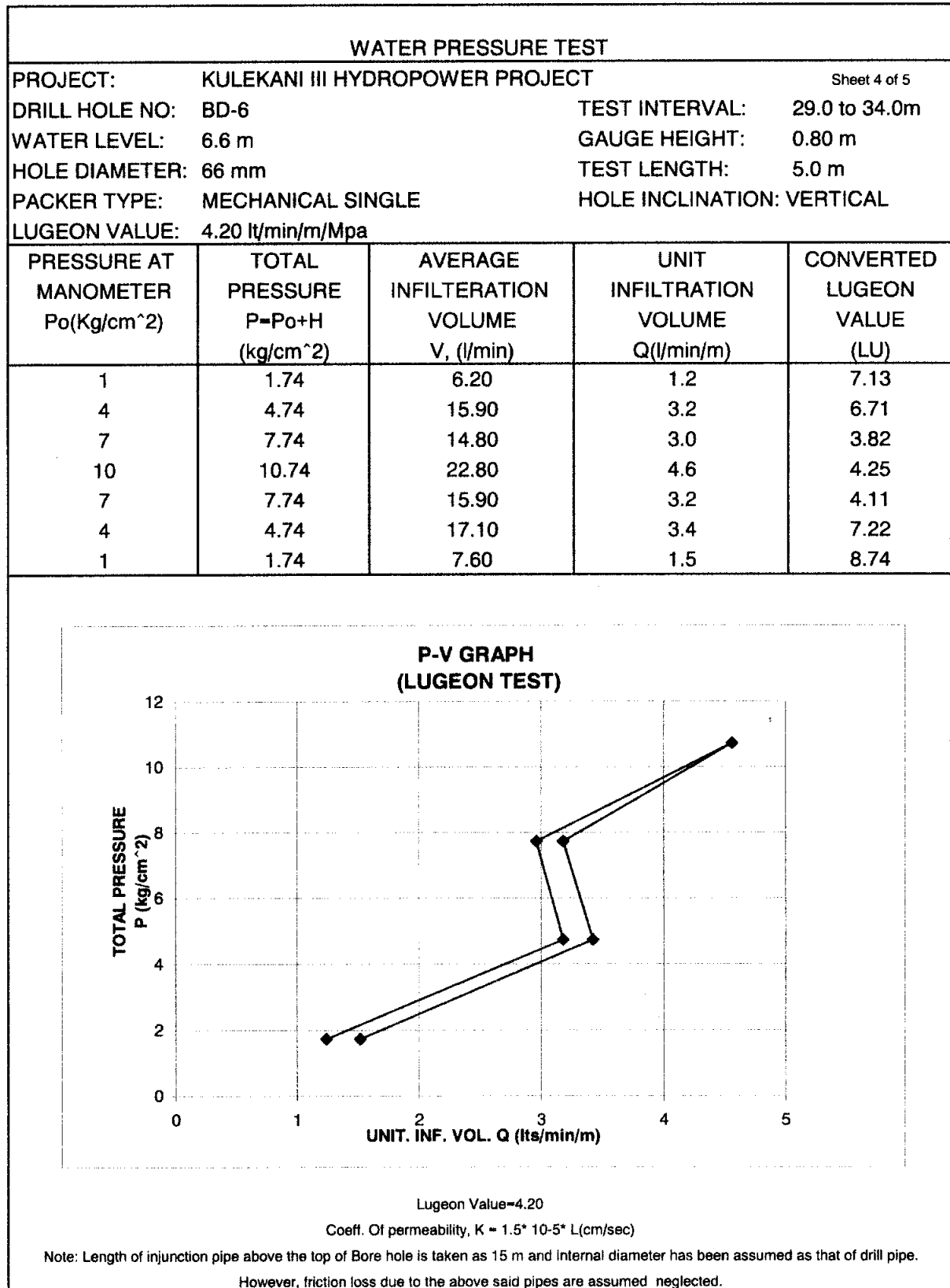


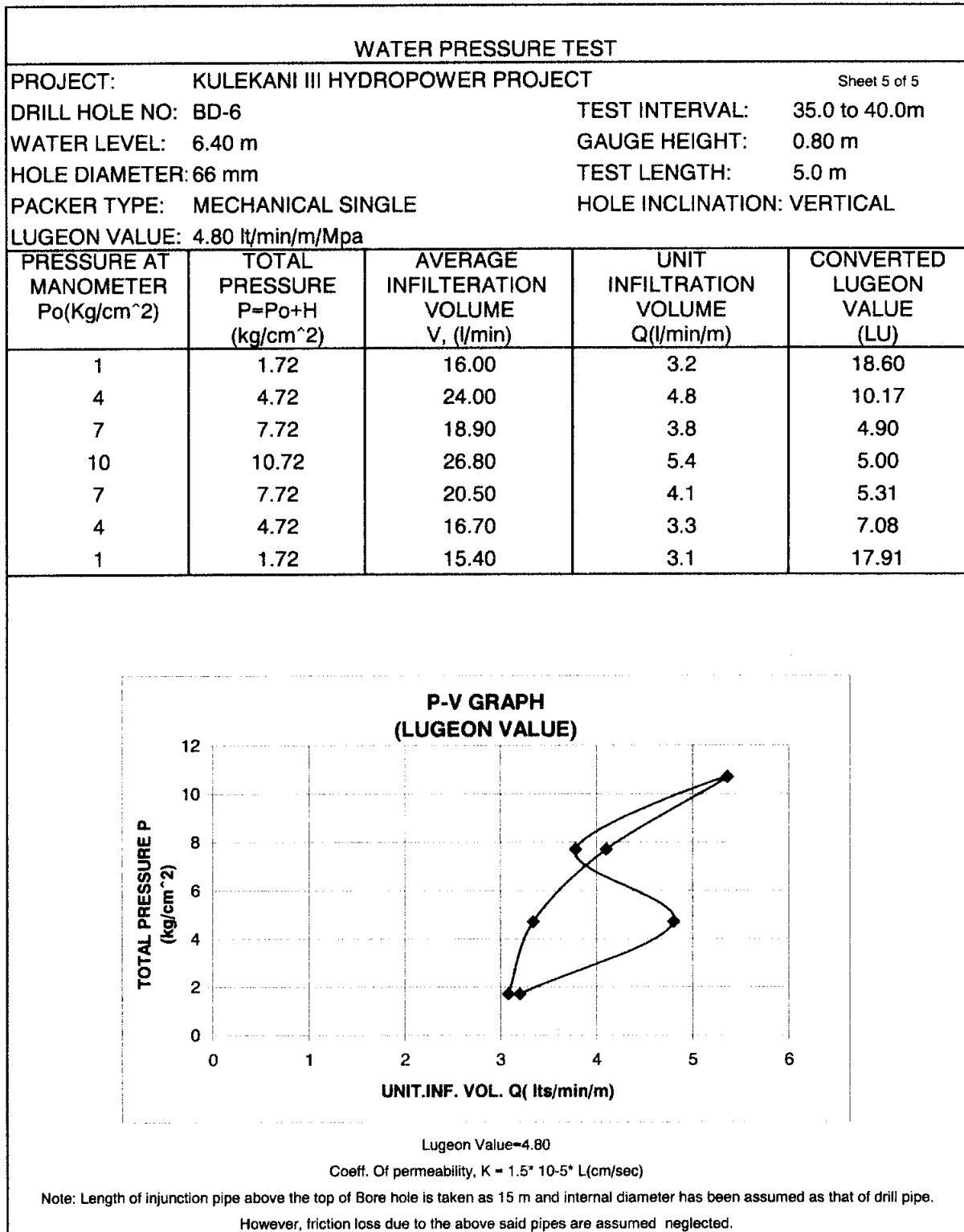


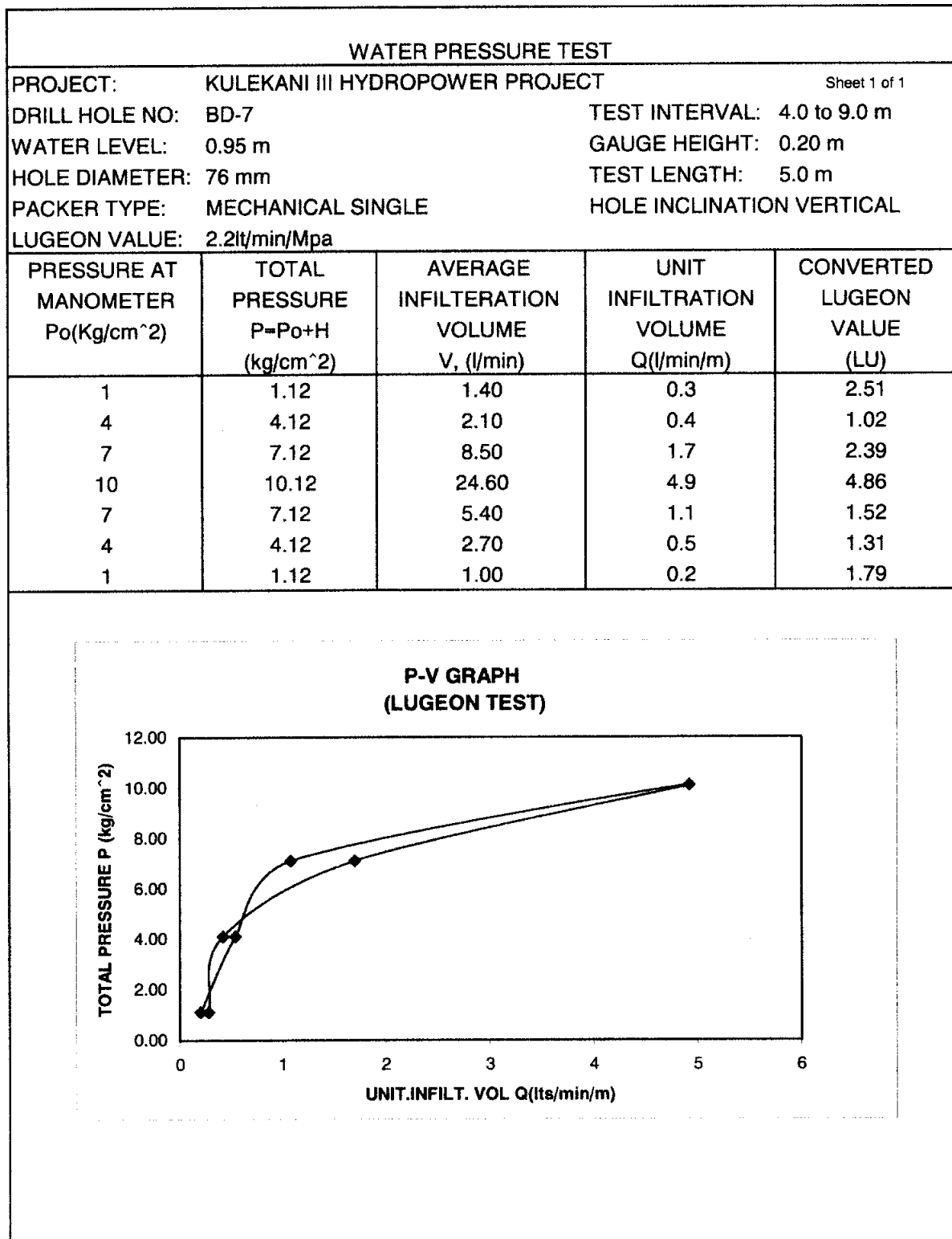


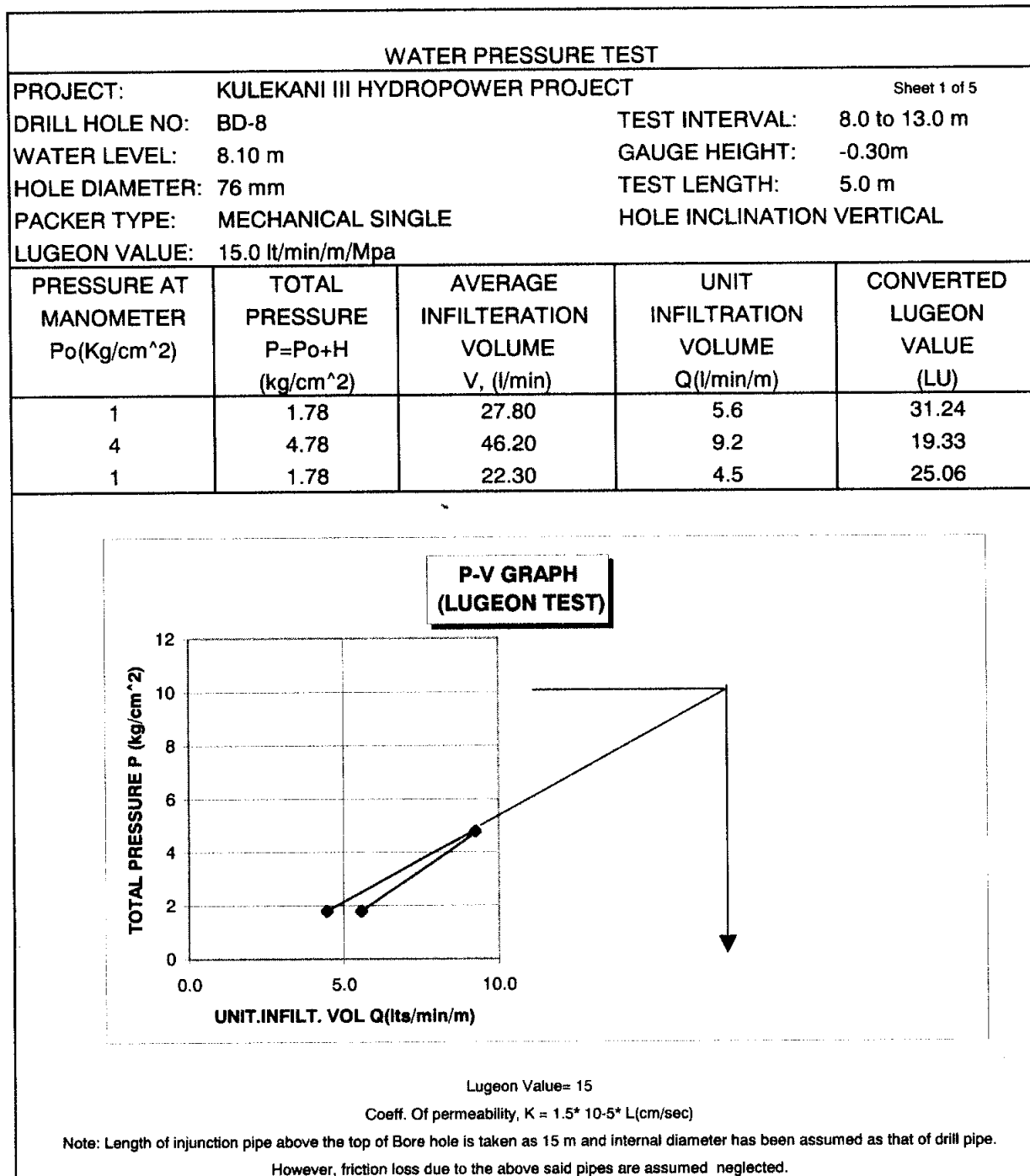


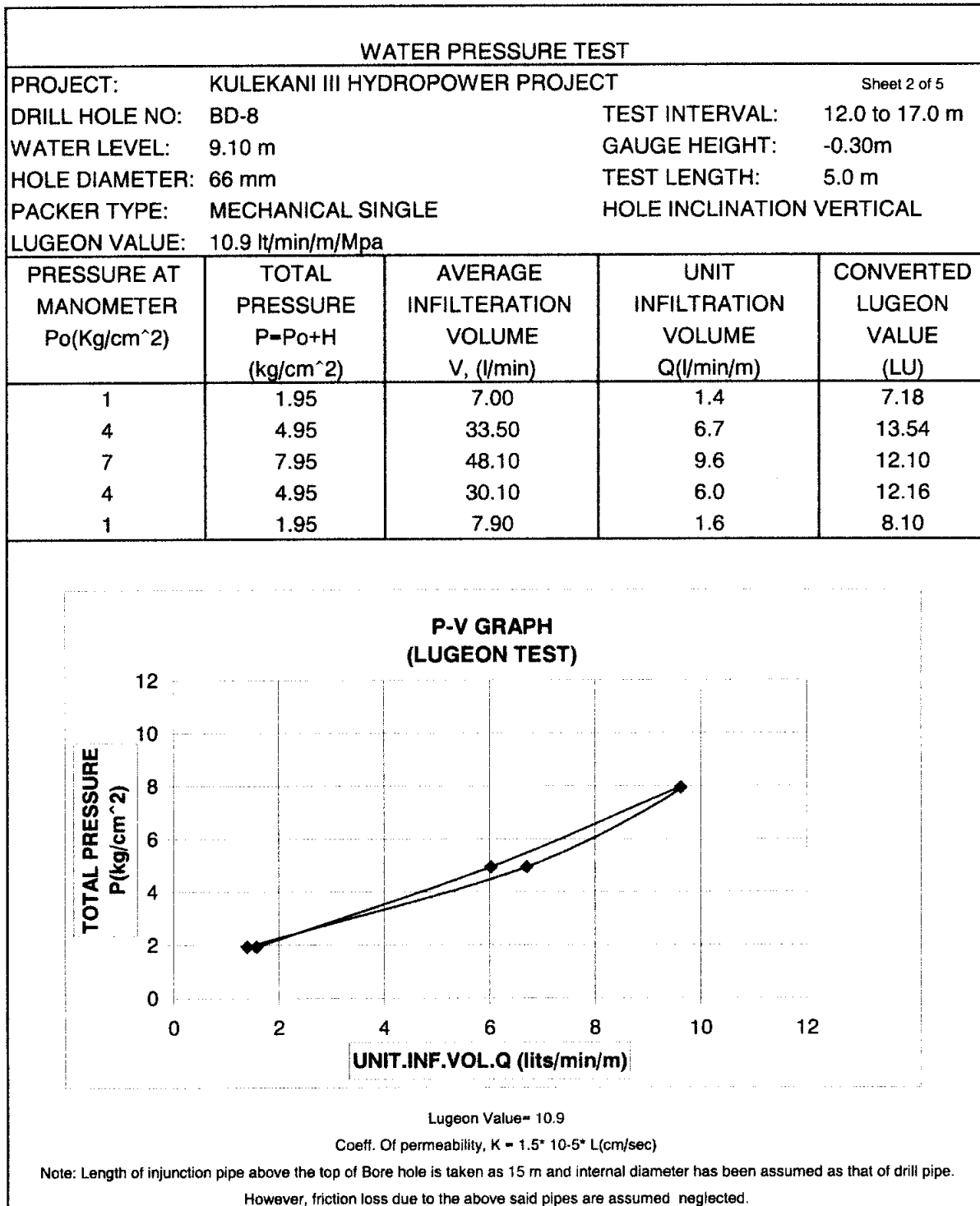


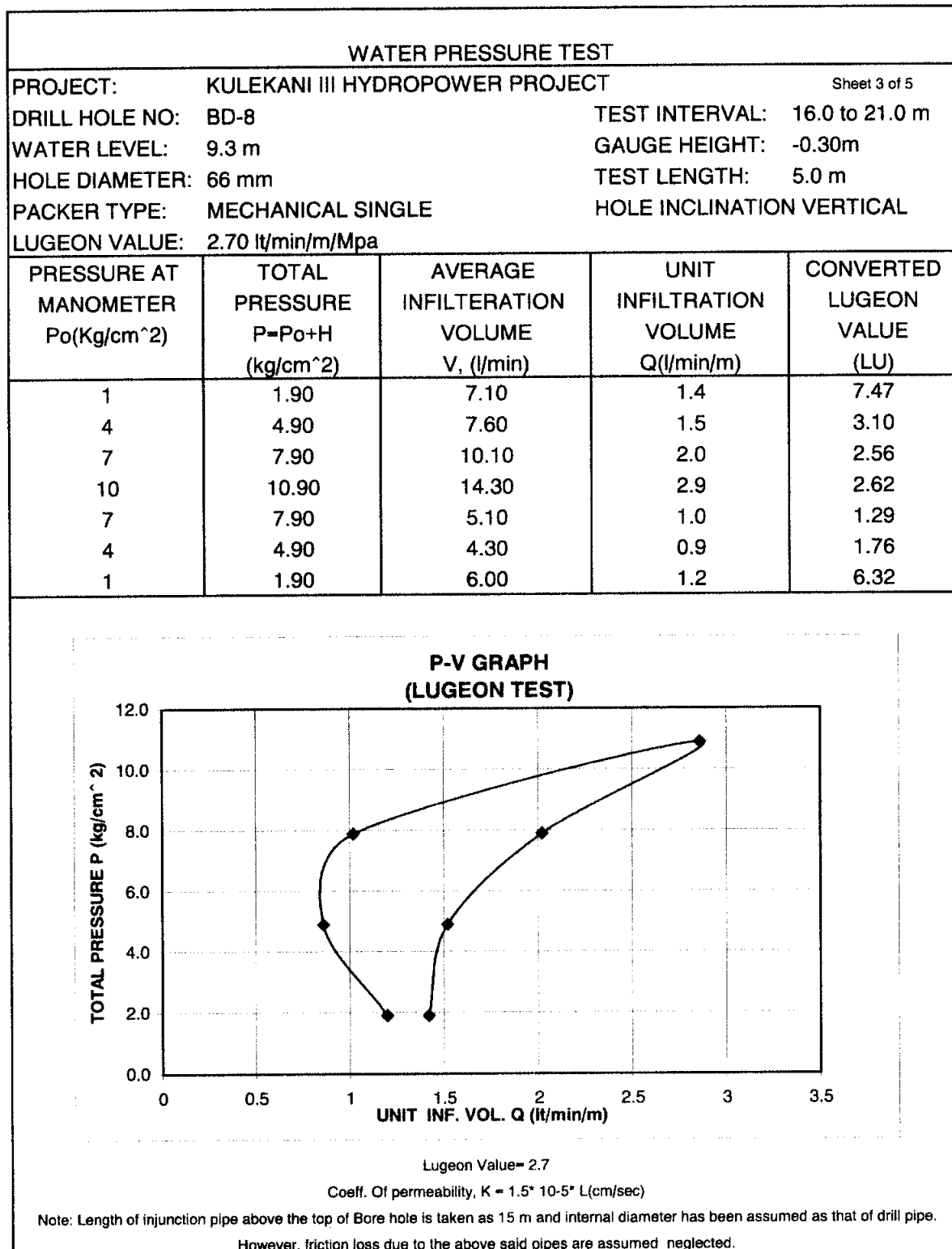




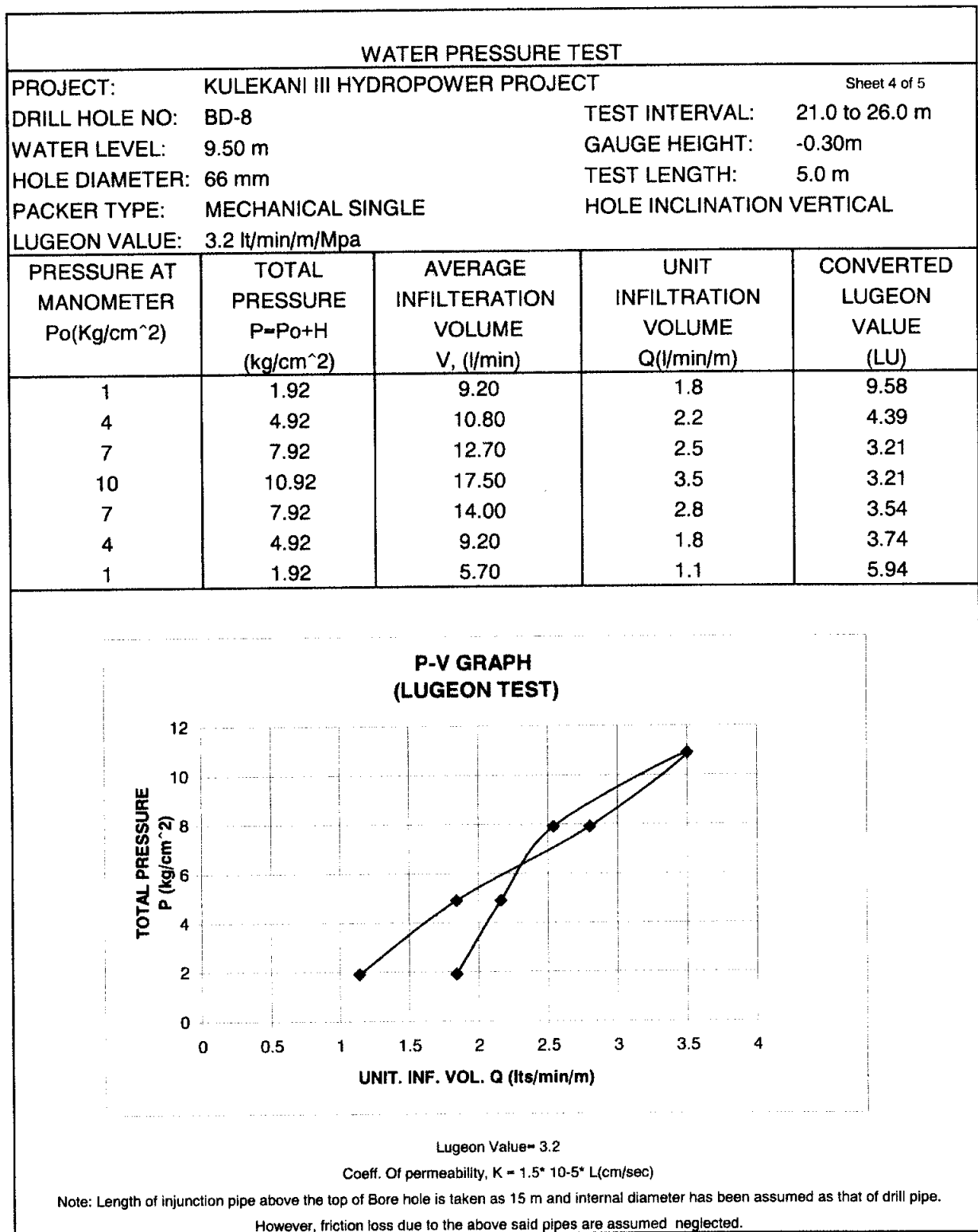


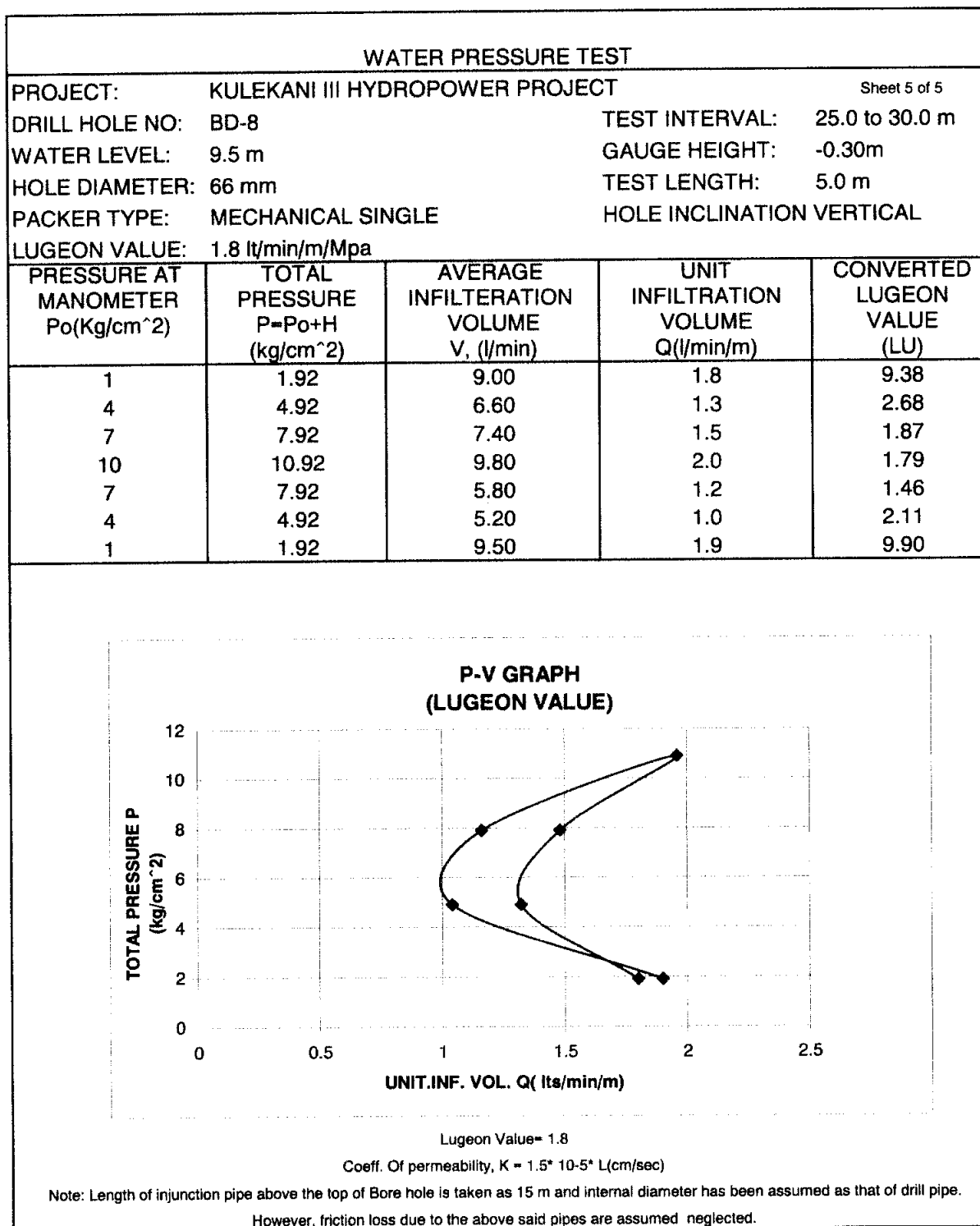


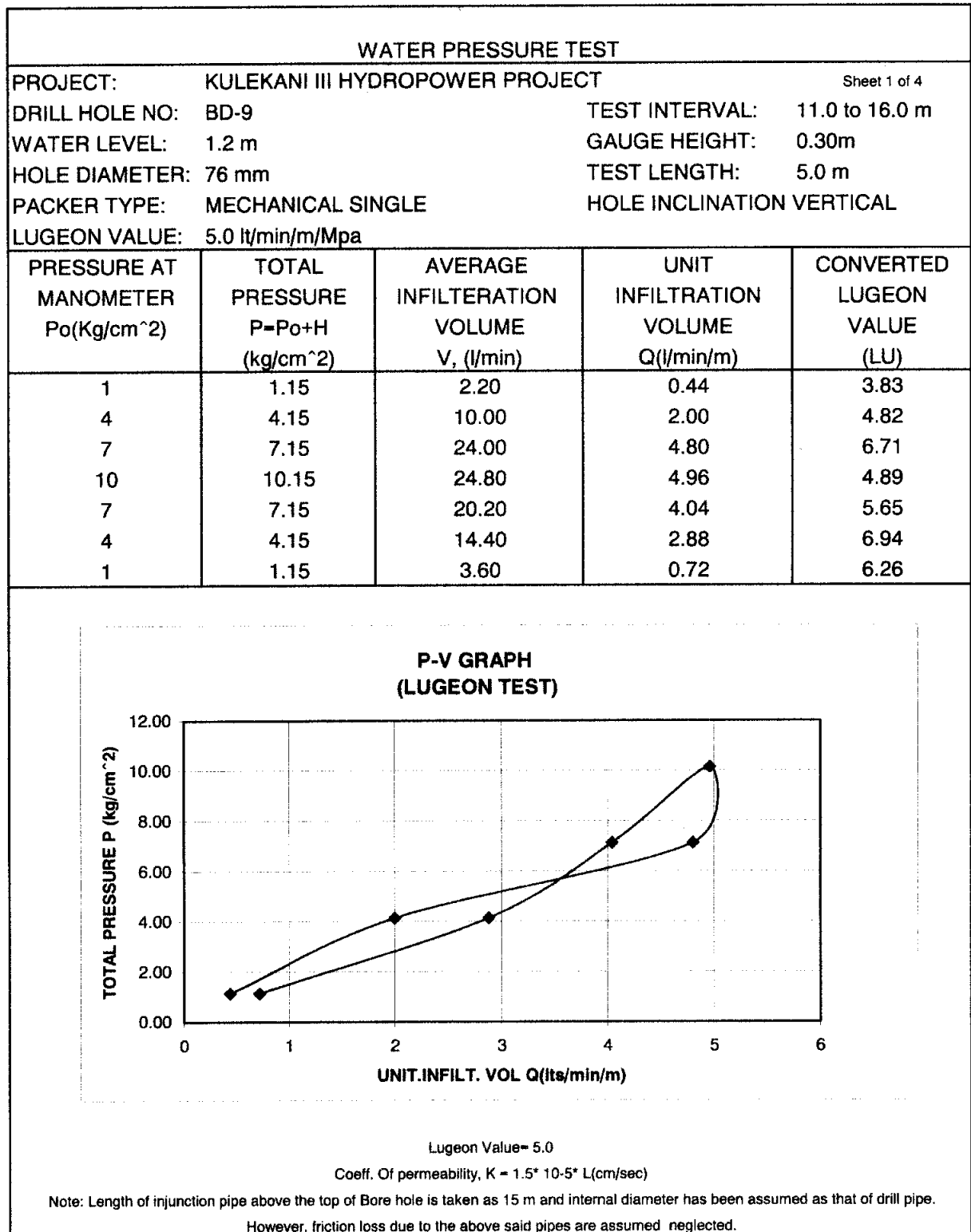






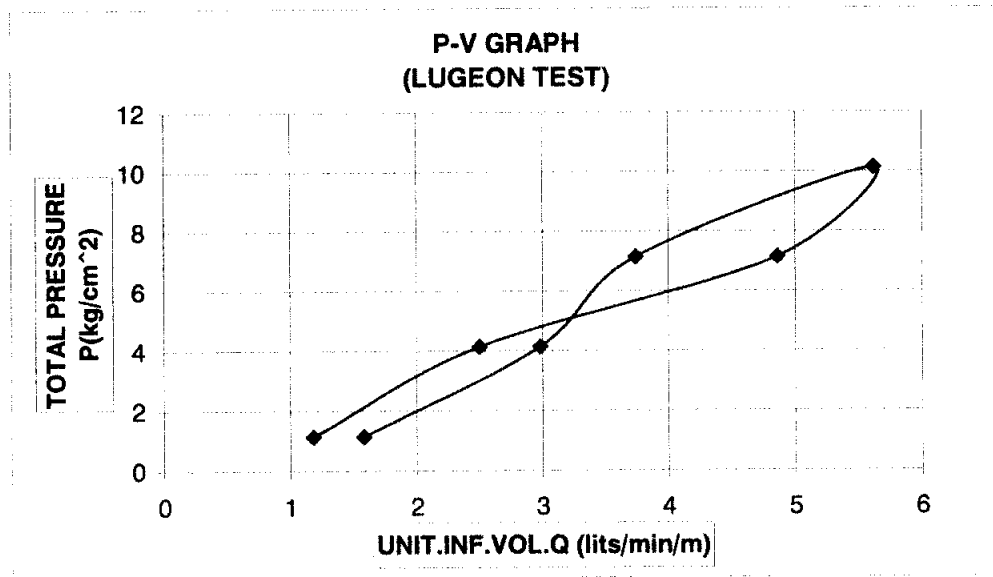






WATER PRESSURE TEST		
PROJECT:	KULEKANI III HYDROPOWER PROJECT	Sheet 2 of 4
DRILL HOLE NO:	BD-9	TEST INTERVAL: 16.0 to 21.0 m
WATER LEVEL:	1.20 m	GAUGE HEIGHT: 0.30m
HOLE DIAMETER:	76 mm	TEST LENGTH: 5.0 m
PACKER TYPE:	MECHANICAL SINGLE	HOLE INCLINATION VERTICAL
LUGEON VALUE:	5.5 lt/min/m/Mpa	

PRESSURE AT MANOMETER $P_o(\text{Kg/cm}^2)$	TOTAL PRESSURE $P=P_o+H$ ( $\text{kg/cm}^2$ )	AVERAGE INFILTRATION VOLUME $V, (\text{l/min})$	UNIT INFILTRATION VOLUME $Q(\text{l/min/m})$	CONVERTED LUGEON VALUE (LU)
1	1.15	7.90	1.6	13.74
4	4.15	14.90	3.0	7.18
7	7.15	18.70	3.7	5.23
10	10.15	28.10	5.6	5.54
7	7.15	24.30	4.9	6.80
4	4.15	12.50	2.5	6.02
1	1.15	5.90	1.2	10.26



Lugeon Value= 5.5

Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L(cm/sec)}$

Note: Length of injunction pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

However, friction loss due to the above said pipes are assumed neglected.

### WATER PRESSURE TEST

Sheet 3 of 4

PROJECT: KULEKANI III HYDROPOWER PROJECT

DRILL HOLE NO: BD-9

TEST INTERVAL: 21.0 to 26.0 m

WATER LEVEL: 1.2 m

GAUGE HEIGHT: 0.30m

HOLE DIAMETER: 66 mm

TEST LENGTH: 5.0 m

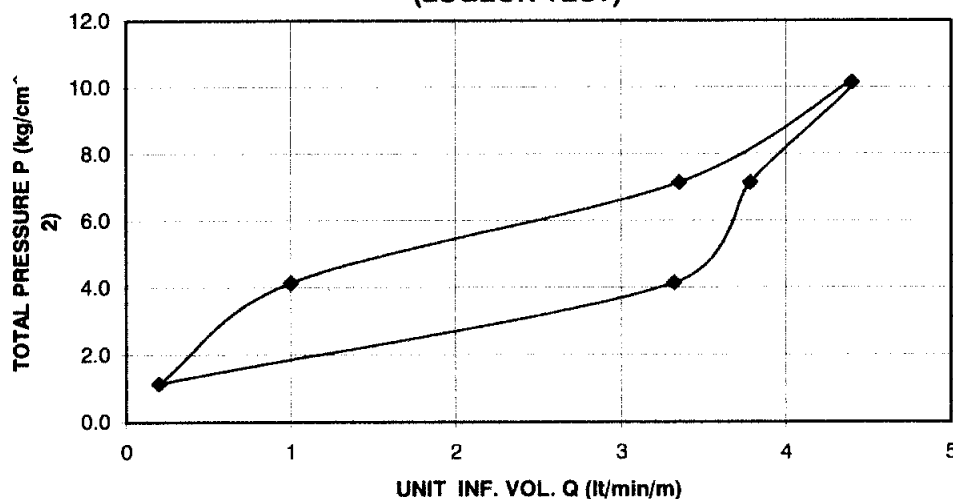
PACKER TYPE: MECHANICAL SINGLE

HOLE INCLINATION VERTICAL

LUGEON VALUE: 4.4 lt/min/m/Mpa

PRESSURE AT MANOMETER $P_o$ (Kg/cm <sup>2</sup> )	TOTAL PRESSURE $P=P_o+H$ (kg/cm <sup>2</sup> )	AVERAGE INFILTRATION VOLUME $V$ , (l/min)		
			INFILTRATION VOLUME $Q$ (l/min/m)	LUGEON VALUE (LU)
1	1.15	1.00	0.2	1.74
4	4.15	16.60	3.3	8.00
7	7.15	18.90	3.8	5.29
10	10.15	22.00	4.4	4.33
7	7.15	16.75	3.4	4.69
4	4.15	5.00	1.0	2.41
1	1.15	1.00	0.2	1.74

**P-V GRAPH  
(LUGEON TEST)**

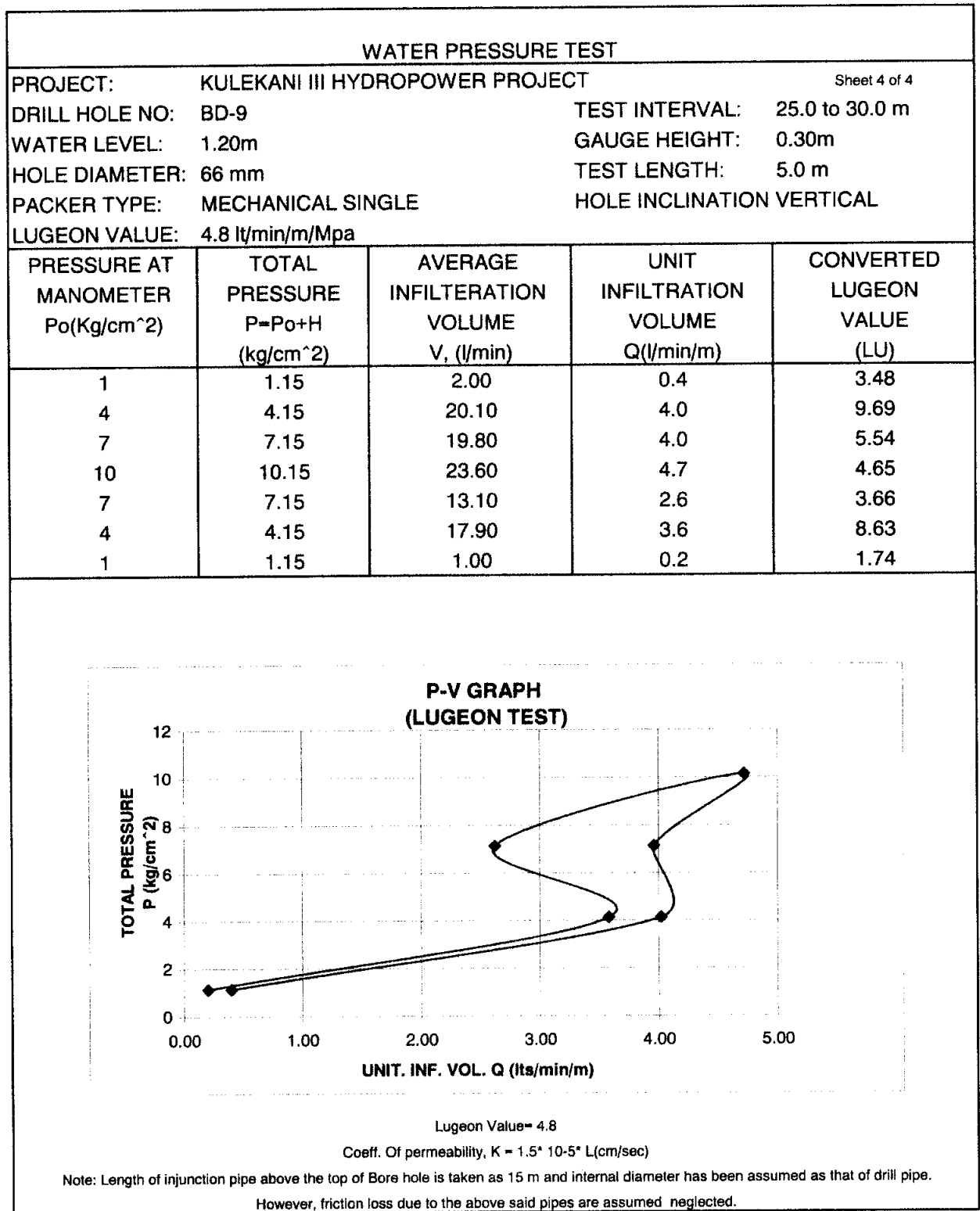


Lugeon Value= 4.4

Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L(cm/sec)}$

Note: Length of injunction pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

However, friction loss due to the above said pipes are assumed neglected.

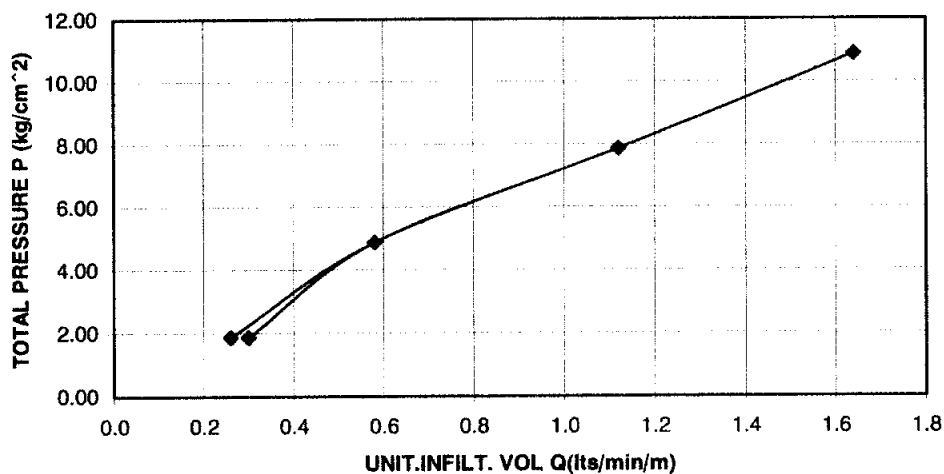


### WATER PRESSURE TEST

PROJECT:	KULEKANI III HYDROPOWER PROJECT	Sheet 1 of 4
DRILL HOLE NO:	BD-10	TEST INTERVAL: 10.0 to 15.0 m
WATER LEVEL:	8.4m	GAUGE HEIGHT: 0.40m
HOLE DIAMETER:	76 mm	TEST LENGTH: 5.0 m
PACKER TYPE:	MECHANICAL SINGLE	HOLE INCLINATION VERTICAL
LUGEON VALUE:	1.5 lt/min/m/Mpa	

PRESSURE AT MANOMETER $P_o(\text{Kg/cm}^2)$	TOTAL PRESSURE $P=P_o+H$ ( $\text{kg/cm}^2$ )	AVERAGE INFILTRATION VOLUME $V_i$ (l/min)	UNIT INFILTRATION VOLUME $Q$ (l/min/m)	CONVERTED LUGEON VALUE (LU)
1	1.88	1.50	0.3	1.60
4	4.88	2.90	0.58	1.19
7	7.88	5.60	1.12	1.42
10	10.88	8.20	1.64	1.51
7	7.88	5.60	1.12	1.42
4	4.88	2.90	0.58	1.19
1	1.88	1.30	0.26	1.38

**P-V GRAPH  
(LUGEON TEST)**

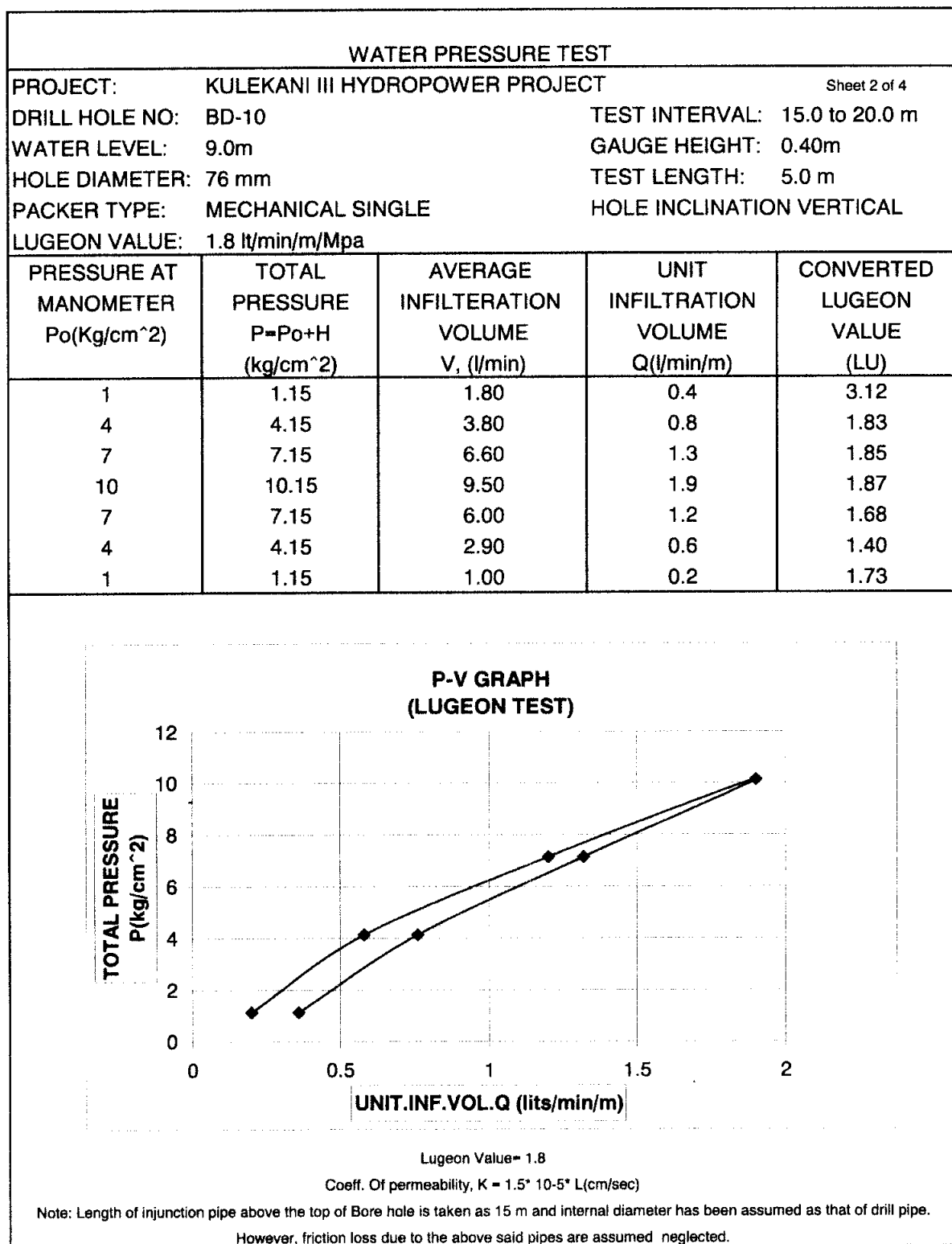


Lugeon Value= 1.5

Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \text{ L/cm/sec}$

Note: Length of injuction pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

However, friction loss due to the above said pipes are assumed neglected.

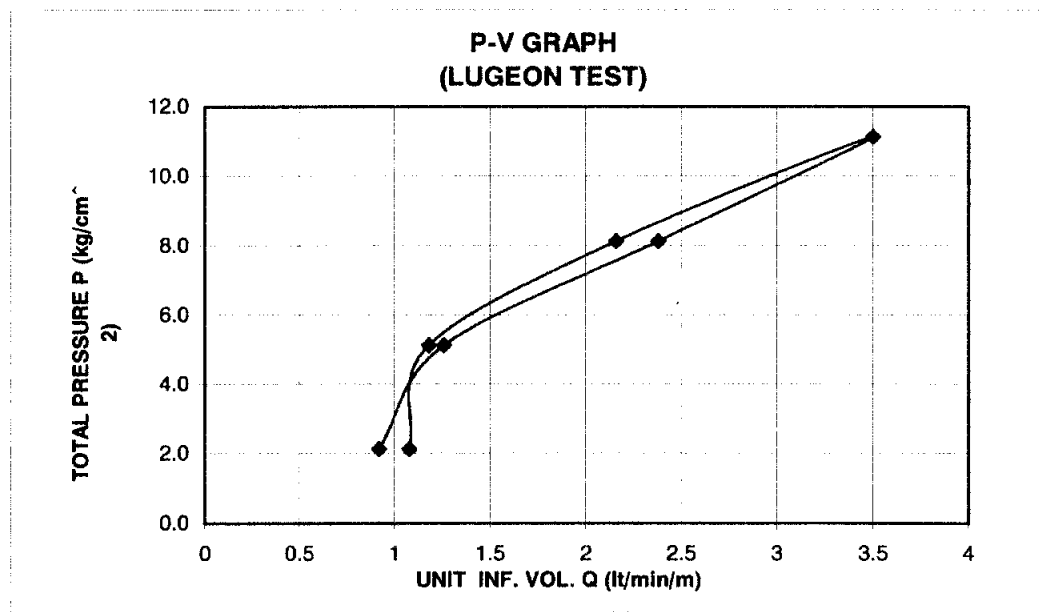




### WATER PRESSURE TEST

PROJECT:	KULEKANI III HYDROPOWER PROJECT	Sheet 3 of 4
DRILL HOLE NO:	BD-10	TEST INTERVAL:
WATER LEVEL:	11.0m	GAUGE HEIGHT:
HOLE DIAMETER:	66 mm	TEST LENGTH:
PACKER TYPE:	MECHANICAL SINGLE	HOLE INCLINATION VERTICAL
LUGEON VALUE:	3.1 lt/min/m/Mpa	

PRESSURE AT MANOMETER $P_o$ (Kg/cm <sup>2</sup> )	TOTAL PRESSURE $P=P_o+H$ (kg/cm <sup>2</sup> )	AVERAGE INFILTRATION VOLUME $V_i$ (l/min)	UNIT INFILTRATION VOLUME $Q$ (l/min/m)	CONVERTED LUGEON VALUE (LU)
1	2.14	4.60	0.9	4.30
4	5.14	6.30	1.3	2.45
7	8.14	11.90	2.4	2.92
10	11.14	17.50	3.5	3.14
7	8.14	10.80	2.2	2.65
4	5.14	5.90	1.2	2.30
1	2.14	5.40	1.1	5.05

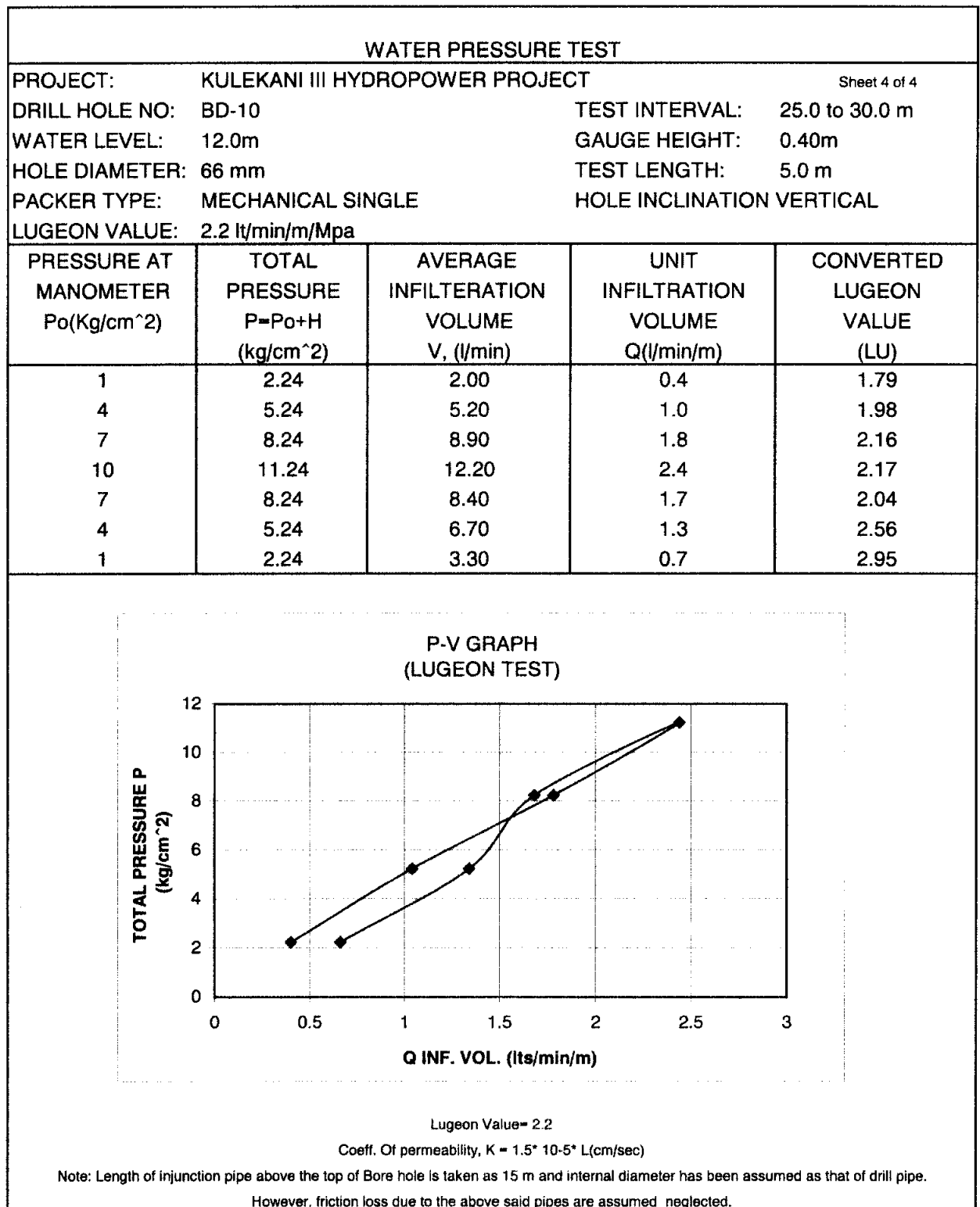


Lugeon Value= 3.1

Coeff. Of permeability,  $K = 1.5 \times 10^{-5}$  L(cm/sec)

Note: Length of injection pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

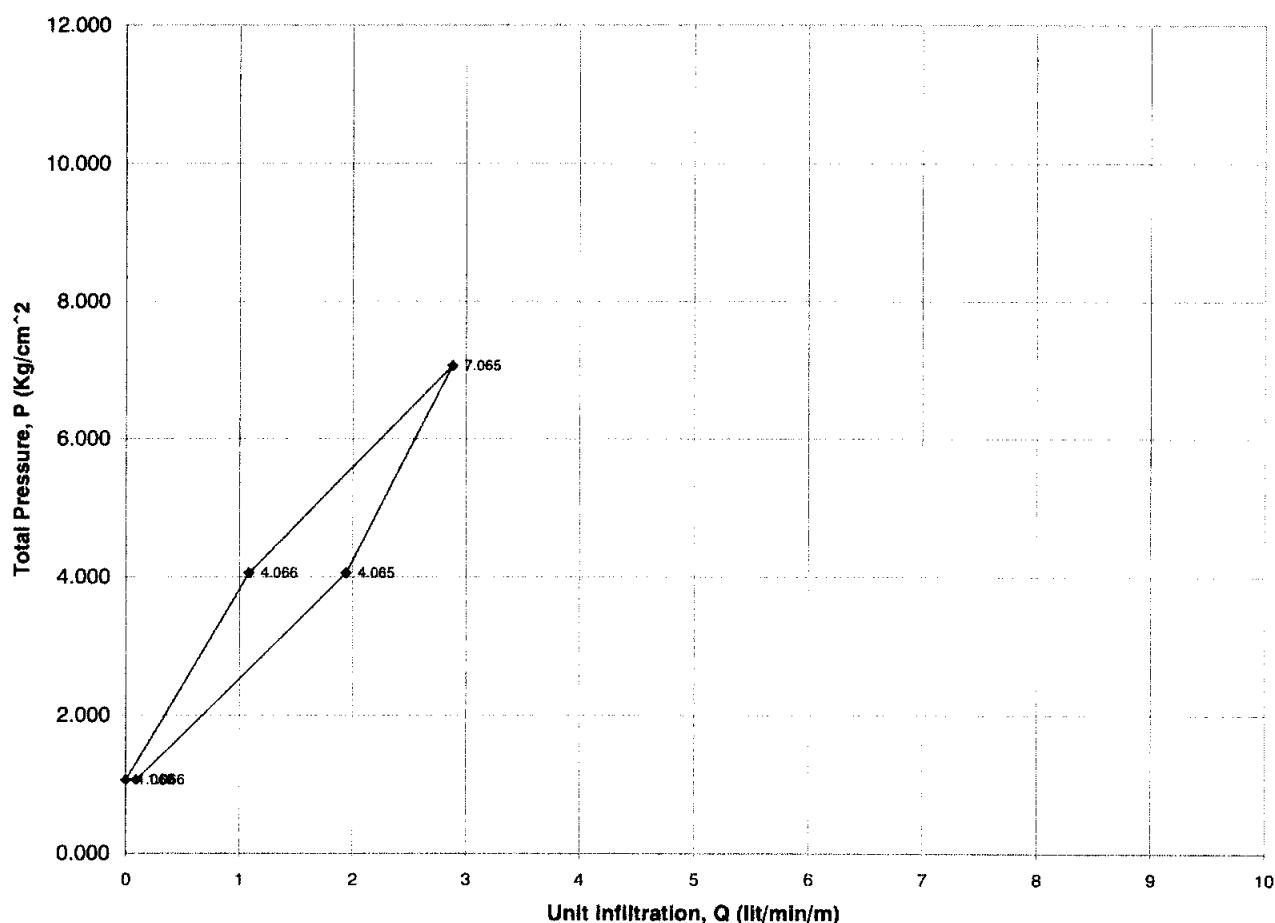
However, friction loss due to the above said pipes are assumed neglected.



Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-1</b>				Test Interval:	<b>5-10</b> m
Water Level: <b>0.0</b> m				Gauge Height:	<b>0.66</b> m
Radius of Hole: <b>0.038</b> m				Test Length:	<b>5</b> m
Packer Type: <b>Mechanical Single</b>				Injection pipe Diameter:	<b>0.046</b> m
Lugeon Value: <b>4.620</b> lit/min/m/Mpa				Injection pipe Length (15+5):	<b>20</b> m
Permeability: <b>6.930E-05</b> cm/sec				Hole Inclination:	<b>Vertical</b>

Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=P <sub>o</sub> +H*0.1-H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Water Pressure Head, h=P*1000 cm	Average Infiltration Volume, V,(lit/min)	Unit Infiltration Volume, Q,(lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	1.13E-06	1.066	1065.999	0.450	0.090	0.844	1.093E-05
4	5.269E-04	4.065	4065.473	9.700	1.940	4.772	6.177E-05
7	1.161E-03	7.065	7064.839	14.400	2.880	4.077	5.276E-05
4	1.633E-04	4.066	4065.837	5.400	1.080	2.656	3.438E-05
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH

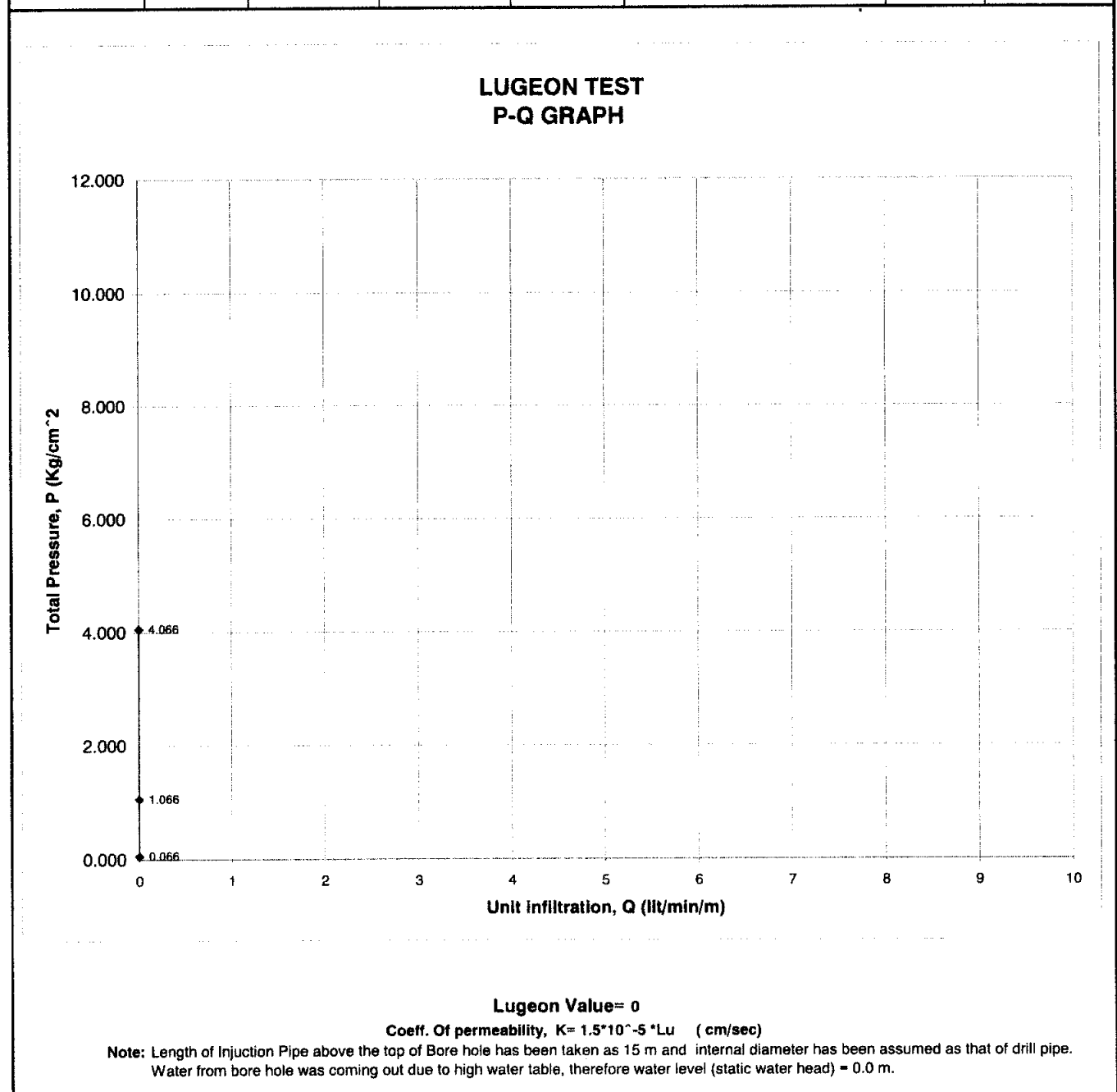


Lugeon Value= 4.62

Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

Note: Length of Injection Pipe above the top of Bore hole has been taken as 15 m and internal diameter has been assumed as that of drill pipe. Water from bore hole was coming out due to high water table, therefore water level (static water head) = 0.0 m.

<b>Project: KULEKHANI-III HPP</b> <b>Drill Hole NO.: BPV-1</b> <b>Water Level: 0.0 m</b> <b>Radius of Hole: 0.038 m</b> <b>Packer Type: Mechanical Single</b> <b>Lugeon Value: 0.000 lit/min/m/Mpa</b> <b>Permeability: 0.000E+00 cm/sec</b>					<b>STRUCTURE: POWERHOUSE</b> <b>Test Interval: 10-15 m</b> <b>Gauge Height: 0.66 m</b> <b>Test Length: 5 m</b> <b>Injection pipe Diameter: 0.046 m</b> <b>Injection pipe Length (15+10) : 25 m</b> <b>Hole Inclination: Vertical</b>		
Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=P <sub>o</sub> +H*0.1-H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Water Pressure Head, h=P*1000 cm	Average Infiltration Volume, V <sub>i</sub> (lit/min)	Unit Infiltration Volume, Q <sub>i</sub> (lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	0.00E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00
4	0.000E+00	4.066	4066.000	0.000	0.000	0.000	0.000E+00
0	0.000E+00	0.066	66.000	0.000	0.000	0.000	0.000E+00
0	0.000E+00	0.066	66.000	0.000	0.000	0.000	0.000E+00
0	0.000E+00	0.066	66.000	0.000	0.000	0.000	0.000E+00



<b>Project: KULEKHANI-III HPP</b> <b>Drill Hole NO.: BPV-1</b> <b>Water Level: 0.0 m</b> <b>Radius of Hole: 0.038 m</b> <b>Packer Type: Mechanical Single</b> <b>Lugeon Value: 0.000 lit/min/m/Mpa</b> <b>Permeability: 0.000E+00 cm/sec</b>					<b>STRUCTURE: POWERHOUSE</b> <b>Test Interval: 15-20 m</b> <b>Gauge Height: 0.66 m</b> <b>Test Length: 5 m</b> <b>Injection pipe Diameter: 0.046 m</b> <b>Injection pipe Length (15+15) : 30 m</b> <b>Hole Inclination: Vertical</b>		
Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=P <sub>o</sub> +H*0.1- H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Water Pressure Head, h=P*1000 cm	Average Infiltration Volume, V,(lit/min)	Unit Infiltration Volume, Q,(lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	0.00E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00
4	0.000E+00	4.066	4066.000	0.000	0.000	0.000	0.000E+00
7	0.000E+00	7.066	7066.000	0.000	0.000	0.000	0.000E+00
0	0.000E+00	0.066	66.000	0.000	0.000	0.000	0.000E+00
0	0.000E+00	0.066	66.000	0.000	0.000	0.000	0.000E+00

