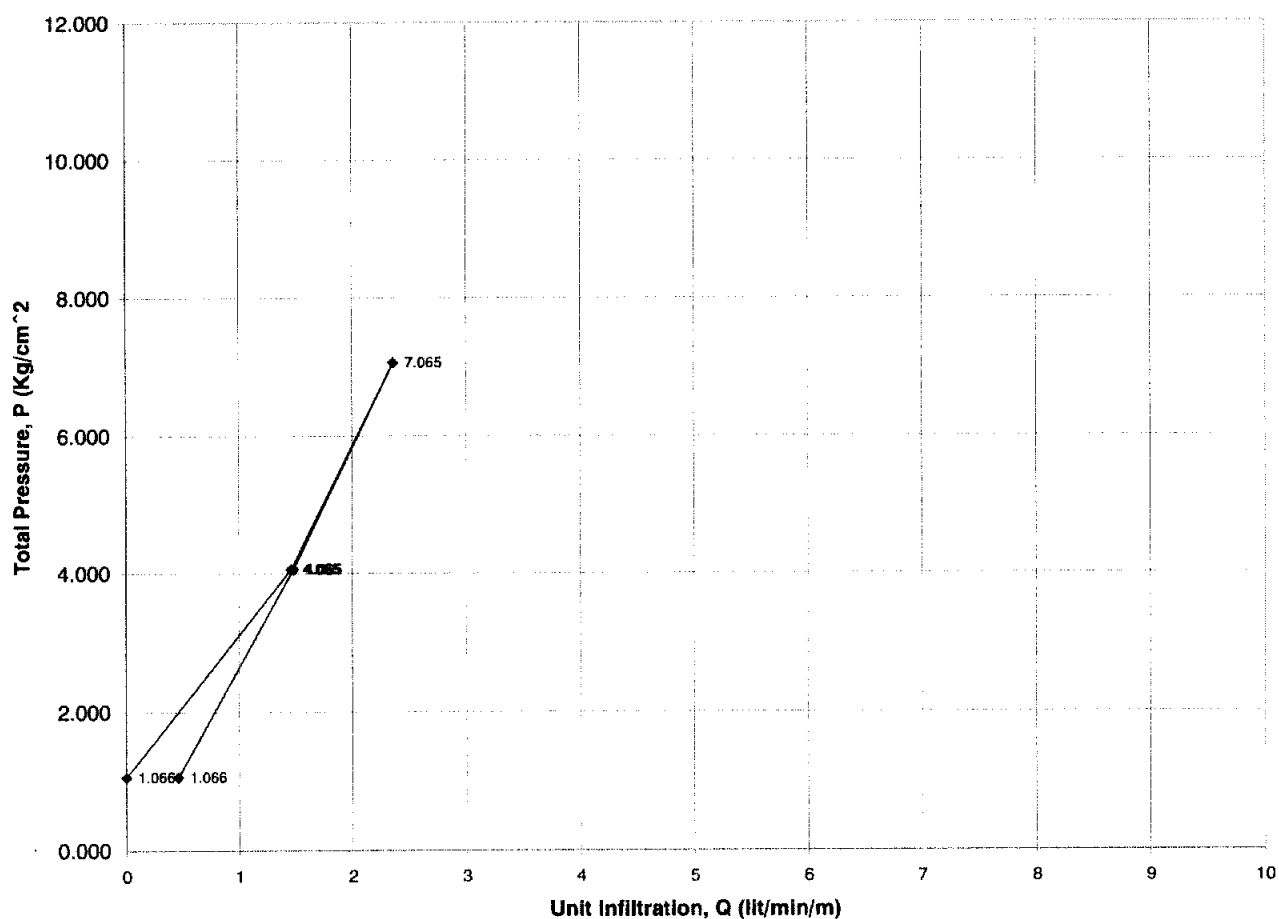


Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-1</b>				Test Interval:	<b>20-25</b> m
Water Level: <b>0.0</b> m				Gauge Height:	<b>0.66</b> m
Radius of Hole: <b>0.038</b> m				Test Length:	<b>5</b> m
Packer Type: <b>Mechanical Single</b>				Injection pipe Diameter:	<b>0.046</b> m
Lugeon Value: <b>3.400</b> lit/min/m/Mpa				Injection pipe Length (15+20):	<b>35</b> m
Permeability: <b>5.100E-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	5.18E-05	1.066	1065.948	2.300	0.460	4.315	5.586E-05
4	5.366E-04	4.065	4065.463	7.400	1.480	3.640	4.712E-05
7	1.365E-03	7.065	7064.635	11.800	2.360	3.341	4.324E-05
4	5.222E-04	4.065	4065.478	7.300	1.460	3.591	4.648E-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= 3.4**

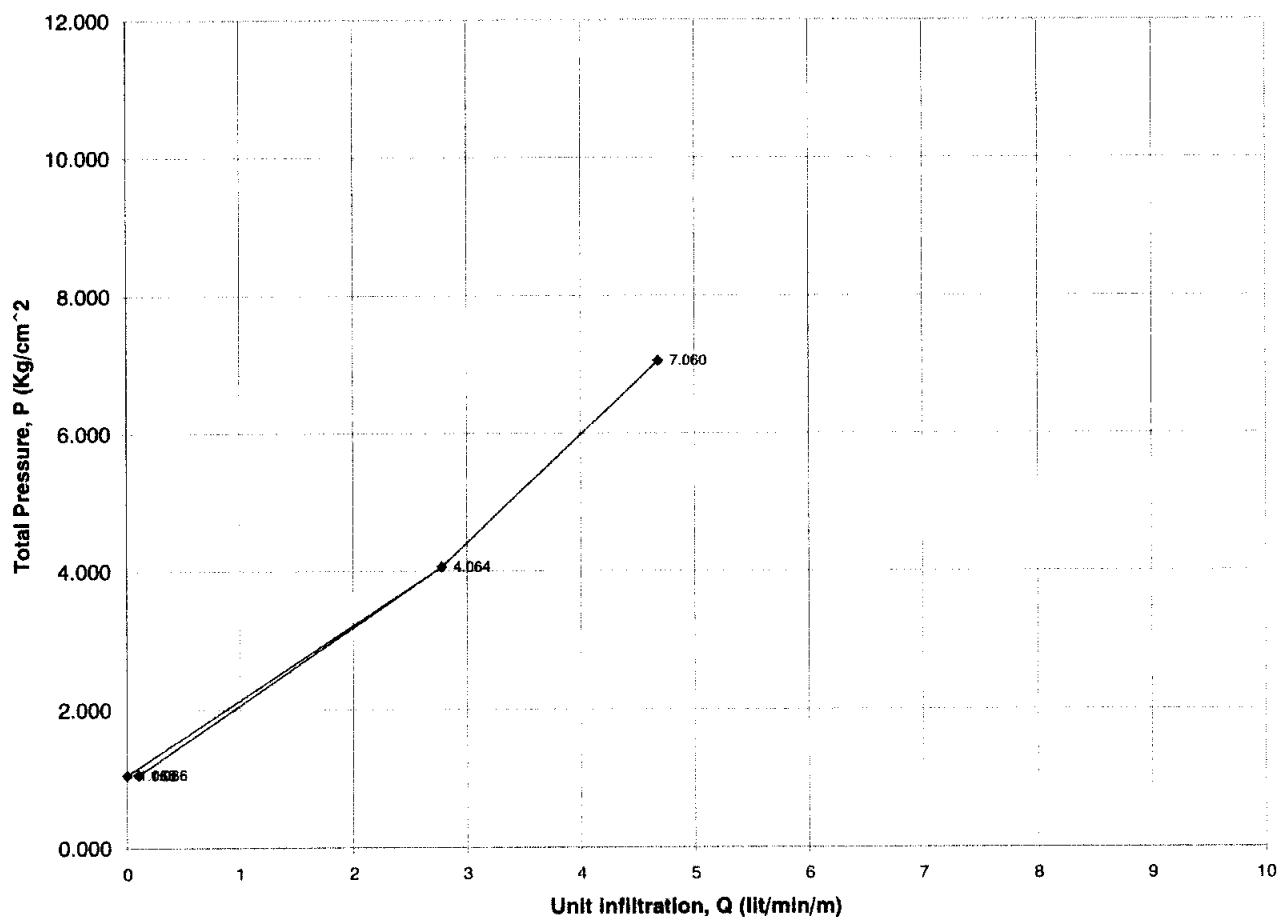
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-1</b>				Test Interval:	<b>25-30</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>5.692</b> lit/min/m/Mpa				Injection pipe Length (15+25):	<b>40</b> m
Permeability: <b>8.538E-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 <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	2.80E-06	1.066	1065.997	0.500	0.100	0.938	1.214E-05
4	2.164E-03	4.064	4063.836	13.900	2.780	6.841	8.854E-05
7	6.133E-03	7.060	7059.867	23.400	4.680	6.629	8.580E-05
4	2.164E-03	4.064	4063.836	13.900	2.780	6.841	8.854E-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= 5.692**

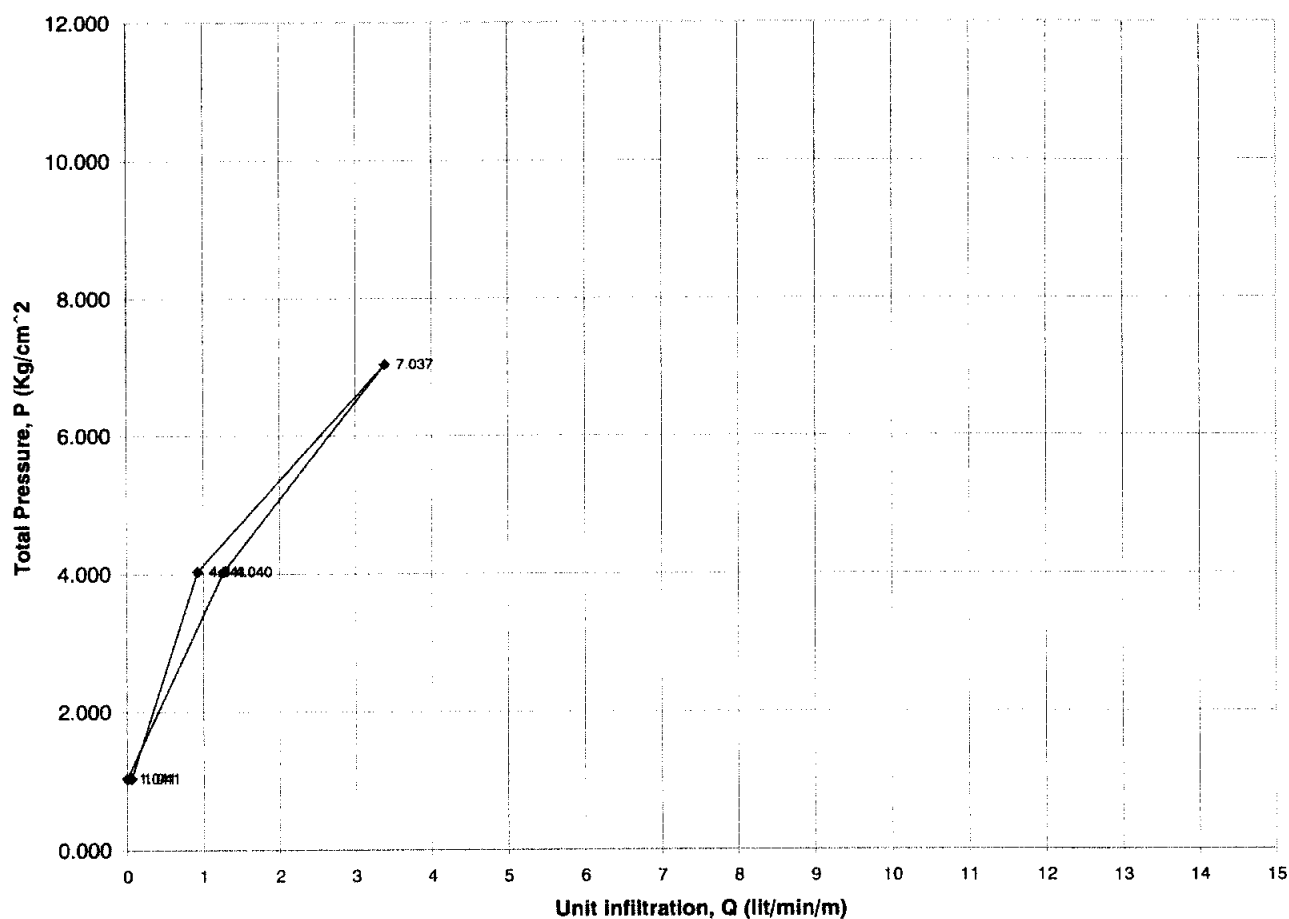
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.:	BPH-1	Test Interval:	30-35	m	
Water Level:	0.0 m	Gauge Height:	0.41	m	
Radius of Hole:	0.038 m	Test Length:	5	m	
Packer Type:	Mechanical Single	Injection pipe Diameter:	0.046	m	
Lugeon Value:	5.840 lit/min/m/Mpa	Injection pipe Length (15+30):	45	m	
Permeability:	8.760E-05 cm/sec	Hole Inclination:	Horizontal		

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	1.041	1040.999	0.300	0.060	0.576	7.460E-06
4	2.666E-04	4.041	4040.733	4.600	0.920	2.277	2.947E-05
7	3.599E-03	7.037	7037.401	16.900	3.380	4.803	6.217E-05
4	5.001E-04	4.040	4040.500	6.300	1.260	3.118	4.036E-05
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



Lugeon Value= 5.84

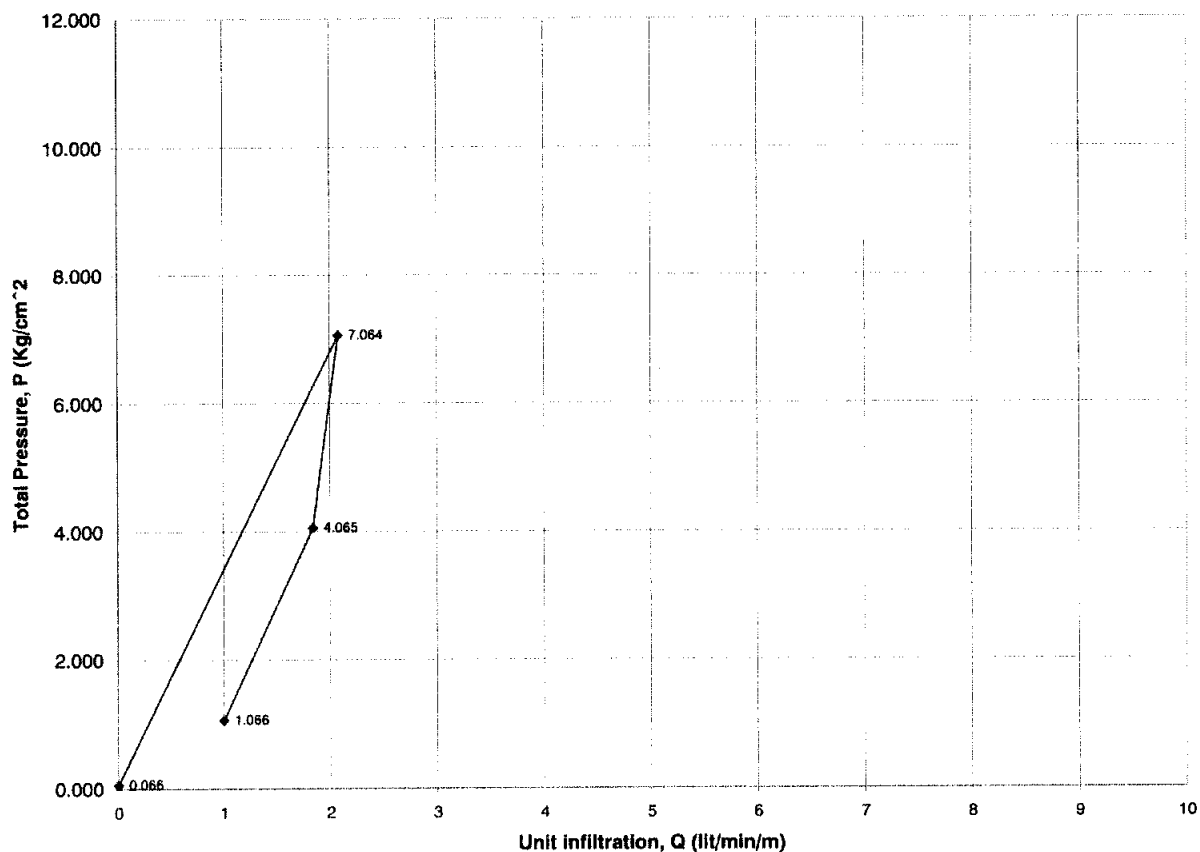
Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-1</b>	Test Interval:	<b>40-45</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>2.923</b> lit/min/m/Mpa	Injection pipe Length (15+40):	<b>55</b> m
Permeability:	<b>4.385E-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=Po+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	3.85E-04	1.066	1065.615	5.000	1.000	9.384	1.215E-04
4	1.303E-03	4.065	4064.697	9.200	1.840	4.527	5.859E-05
7	1.666E-03	7.064	7064.334	10.400	2.080	2.944	3.811E-05
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

**LUGEON TEST  
P-Q GRAPH**



**Lugeon Value= 2.923**

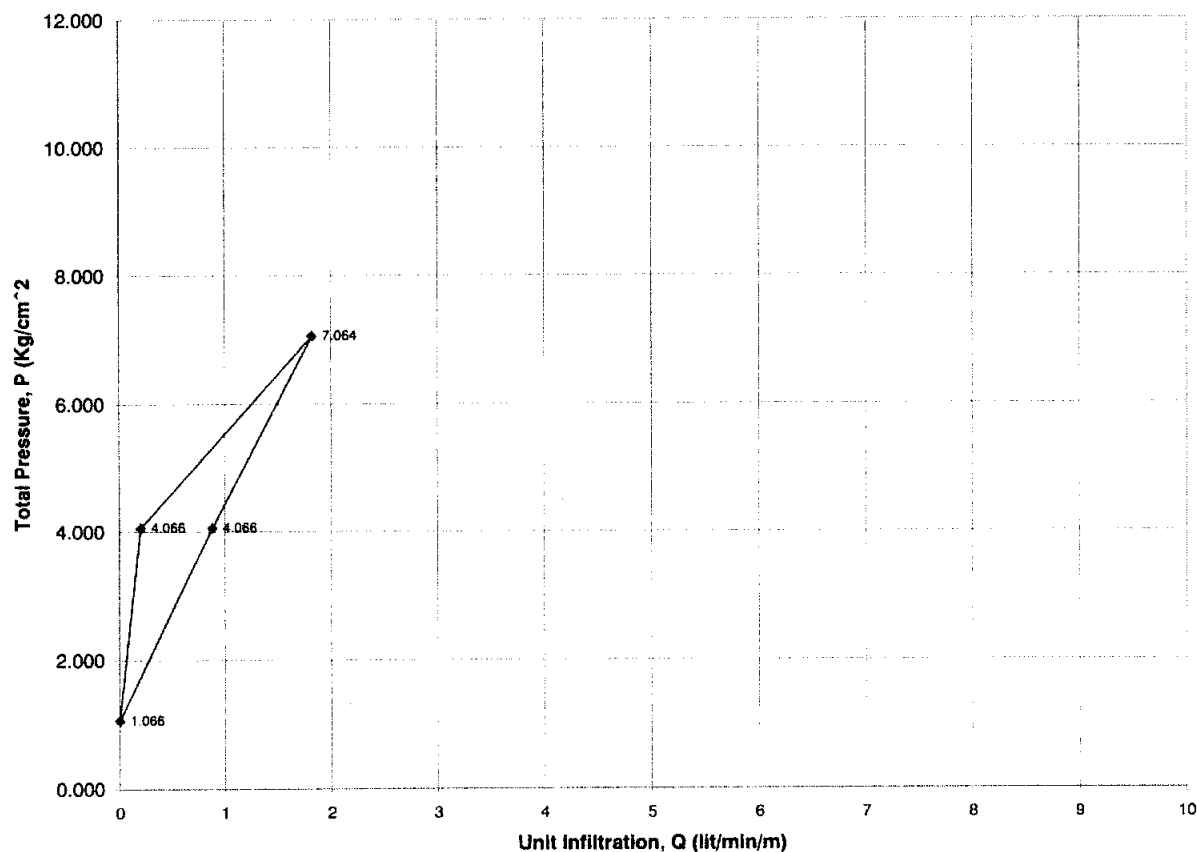
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project: <b>KULEKHANI-III HPP</b>			STRUCTURE: <b>POWERHOUSE</b>		
Drill Hole NO.:	<b>BPV-1</b>		Test Interval:	<b>60-65</b>	<b>m</b>
Water Level:	<b>0.0</b>	<b>m</b>	Gauge Height:	<b>0.66</b>	<b>m</b>
Radius of Hole:	<b>0.038</b>	<b>m</b>	Test Length:	<b>5</b>	<b>m</b>
Packer Type:	<b>Mechanical Single</b>		Injection pipe Diameter:	<b>0.046</b>	<b>m</b>
Lugeon Value:	<b>3.423</b>	<b>lit/min/m/Mpa</b>	Injection pipe Length (15+60):	<b>75</b>	<b>m</b>
Permeability:	<b>5.135E-05</b>	<b>cm/sec</b>	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 <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	4.066E-04	4.066	4065.593	4.400	0.880	2.165	2.802E-05
7	1.739E-03	7.064	7064.261	9.100	1.820	2.576	3.335E-05
4	2.100E-05	4.066	4065.979	1.000	0.200	0.492	6.367E-06
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



Lugeon Value= 3.423

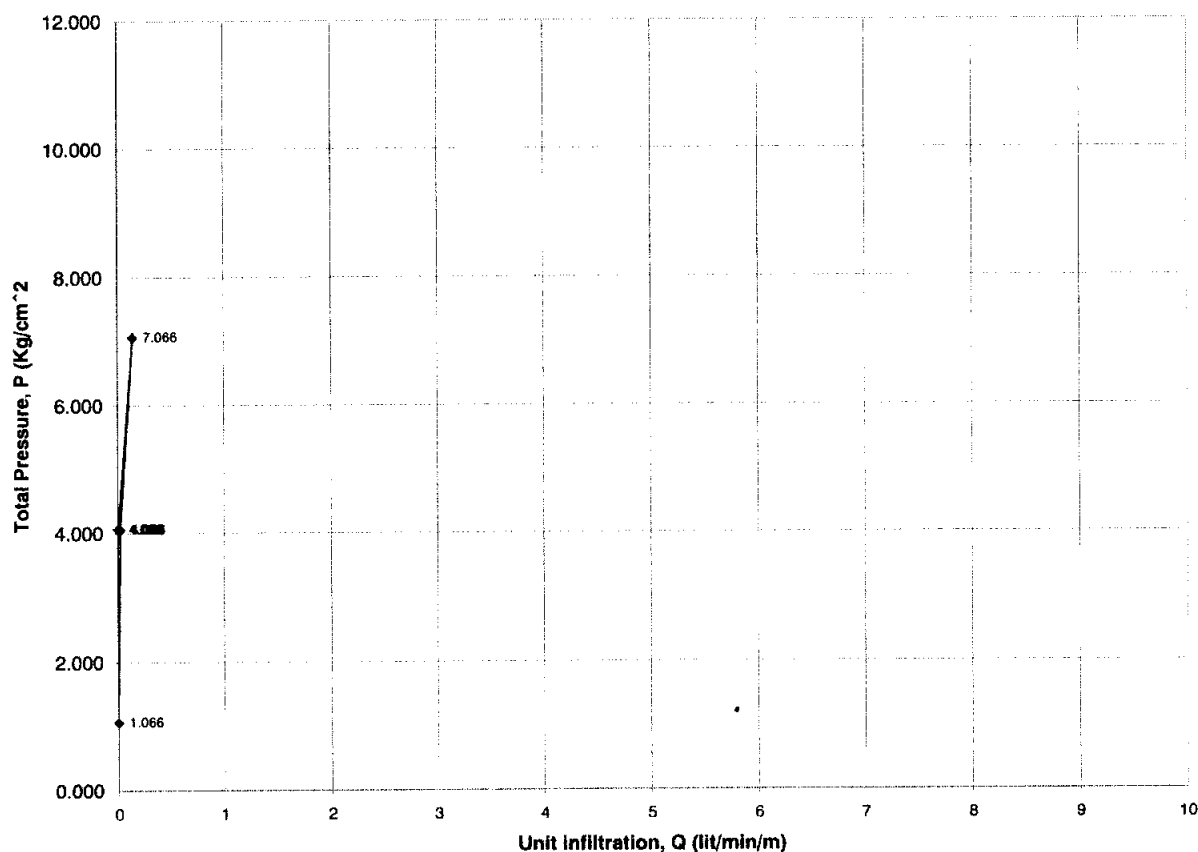
Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times \text{Lu}$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-1</b>	Test Interval:	<b>65-70</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>0.388</b> lit/min/m/Mpa	Injection pipe Length (15+65):	<b>80</b> m
Permeability:	<b>5.820E-06</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=Po+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	2.240E-07	4.066	4066.000	0.100	0.020	0.049	6.367E-07
7	1.098E-05	7.066	7065.989	0.700	0.140	0.198	2.565E-06
4	0.000E+00	4.066	4066.000	0.000	0.000	0.000	0.000E+00
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 0.388**

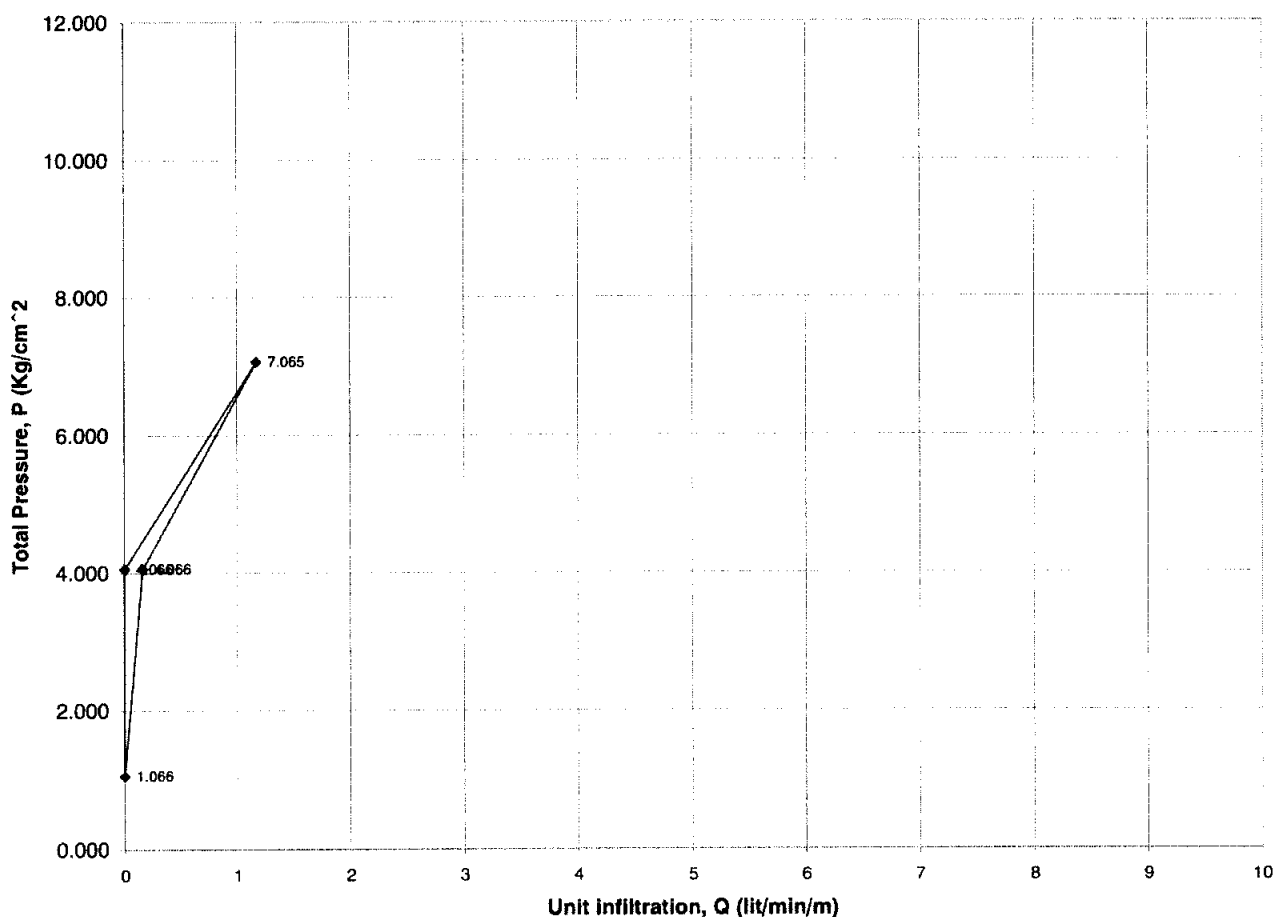
Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-1</b>				Test Interval:	<b>70-75</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>2.340</b> lit/min/m/Mpa				Injection pipe Length (15+70):	<b>85</b> m
Permeability: <b>3.510E-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	0.00E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00
4	1.523E-05	4.066	4065.985	0.800	0.160	0.394	5.093E-06
7	8.145E-04	7.065	7065.186	5.850	1.170	1.656	2.143E-05
4	0.000E+00	4.066	4066.000	0.000	0.000	0.000	0.000E+00
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 2.34**

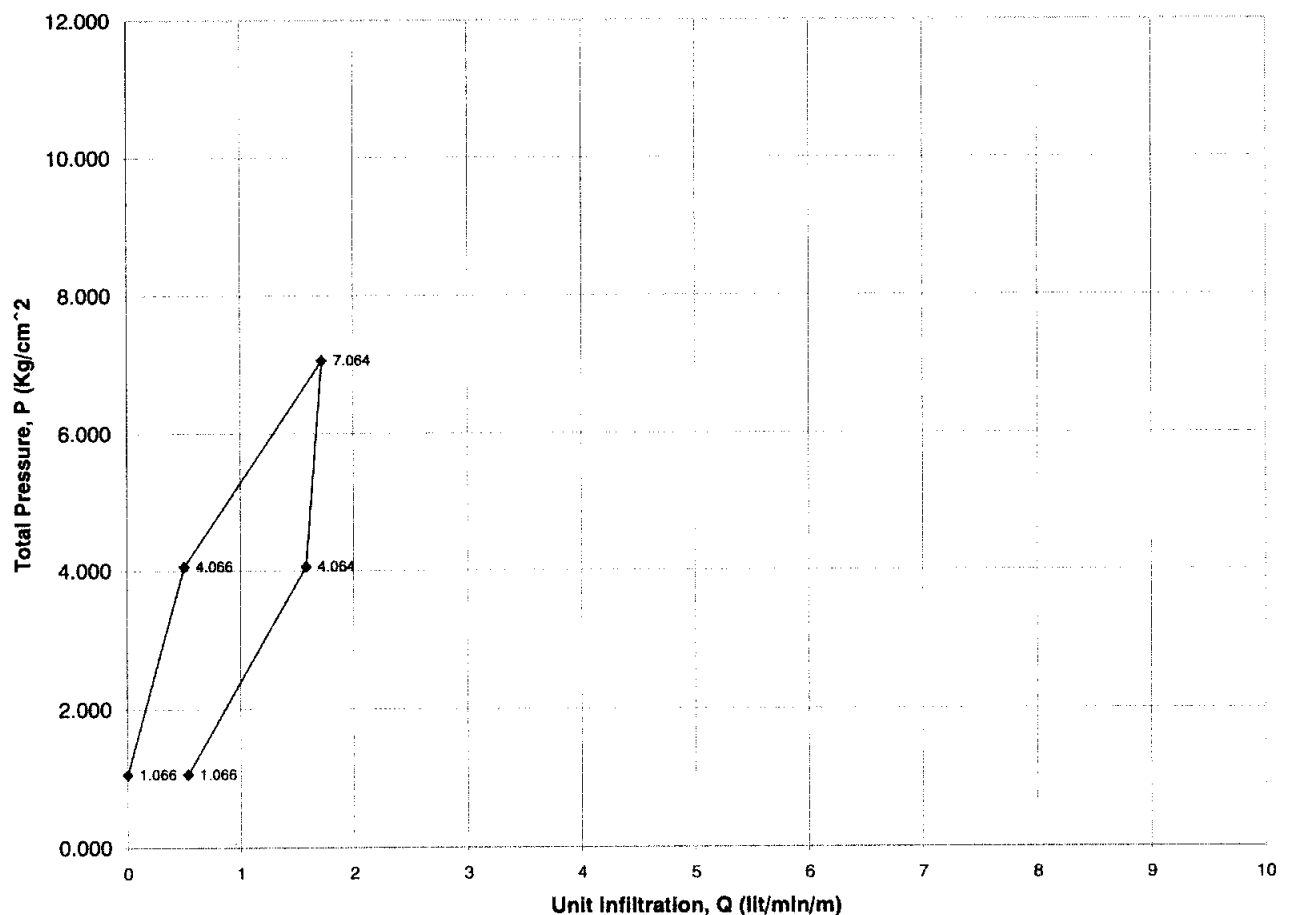
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-1</b>				Test Interval:	<b>75-80</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>2.870</b> lit/min/m/Mpa				Injection pipe Length (15+75):	<b>90</b> m
Permeability: <b>4.305E-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=Po+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,(lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	1.78E-04	1.066	1065.822	2.660	0.532	4.991	6.461E-05
4	1.573E-03	4.064	4064.427	7.900	1.580	3.887	5.032E-05
7	1.864E-03	7.064	7064.136	8.600	1.720	2.435	3.152E-05
4	1.575E-04	4.066	4065.843	2.500	0.500	1.230	1.592E-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= 2.87**

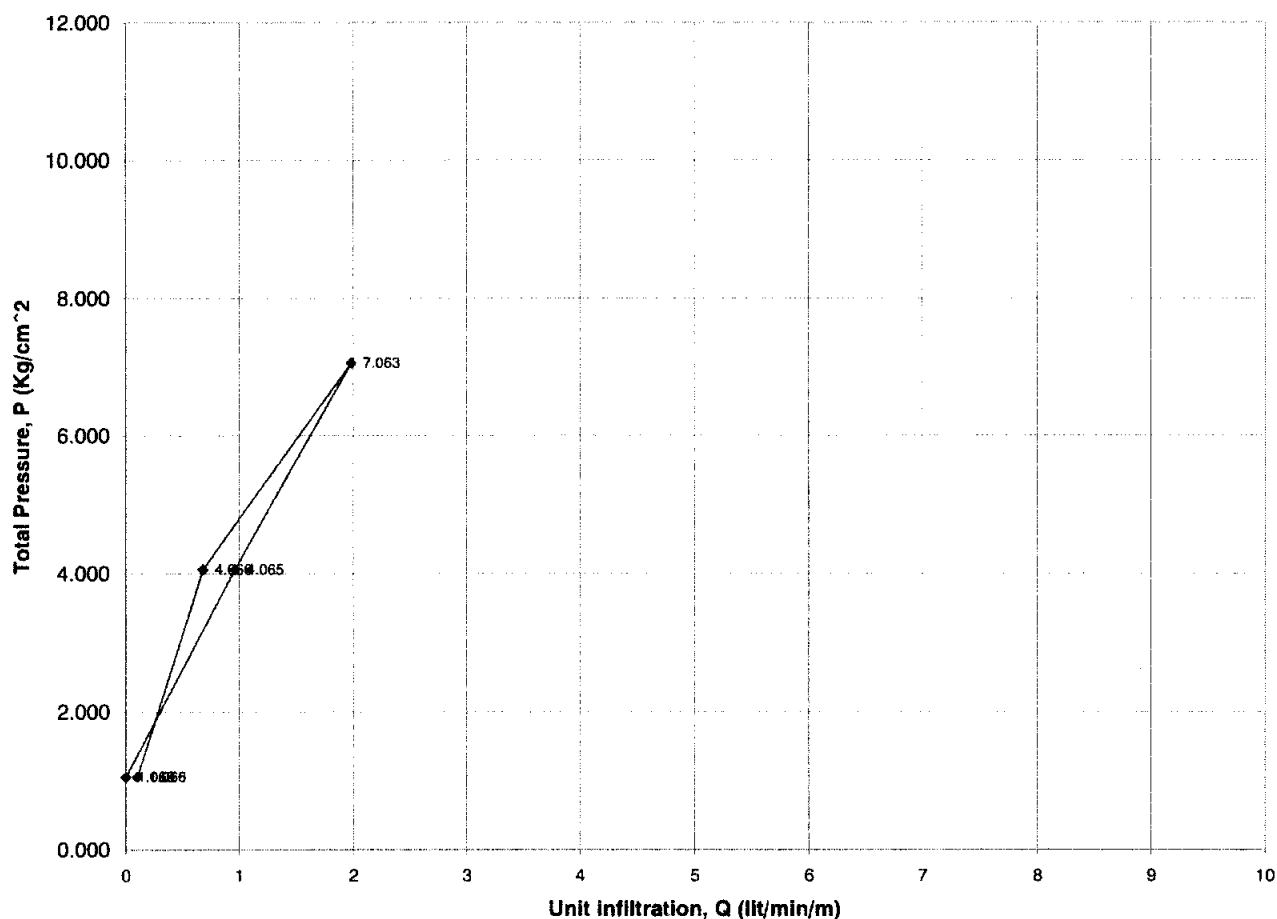
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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: 3.340 lit/min/m/Mpa</b> <b>Permeability: 5.010E-05 cm/sec</b>				<b>STRUCTURE: POWERHOUSE</b> <b>Test Interval: 80-85 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+80): 95 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	6.129E-04	4.065	4065.387	4.800	0.960	2.361	3.056E-05
7	2.607E-03	7.063	7063.393	9.900	1.980	2.803	3.628E-05
4	3.075E-04	4.066	4065.693	3.400	0.680	1.673	2.165E-05
1	6.650E-06	1.066	1065.993	0.500	0.100	0.938	1.214E-05

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 3.34**

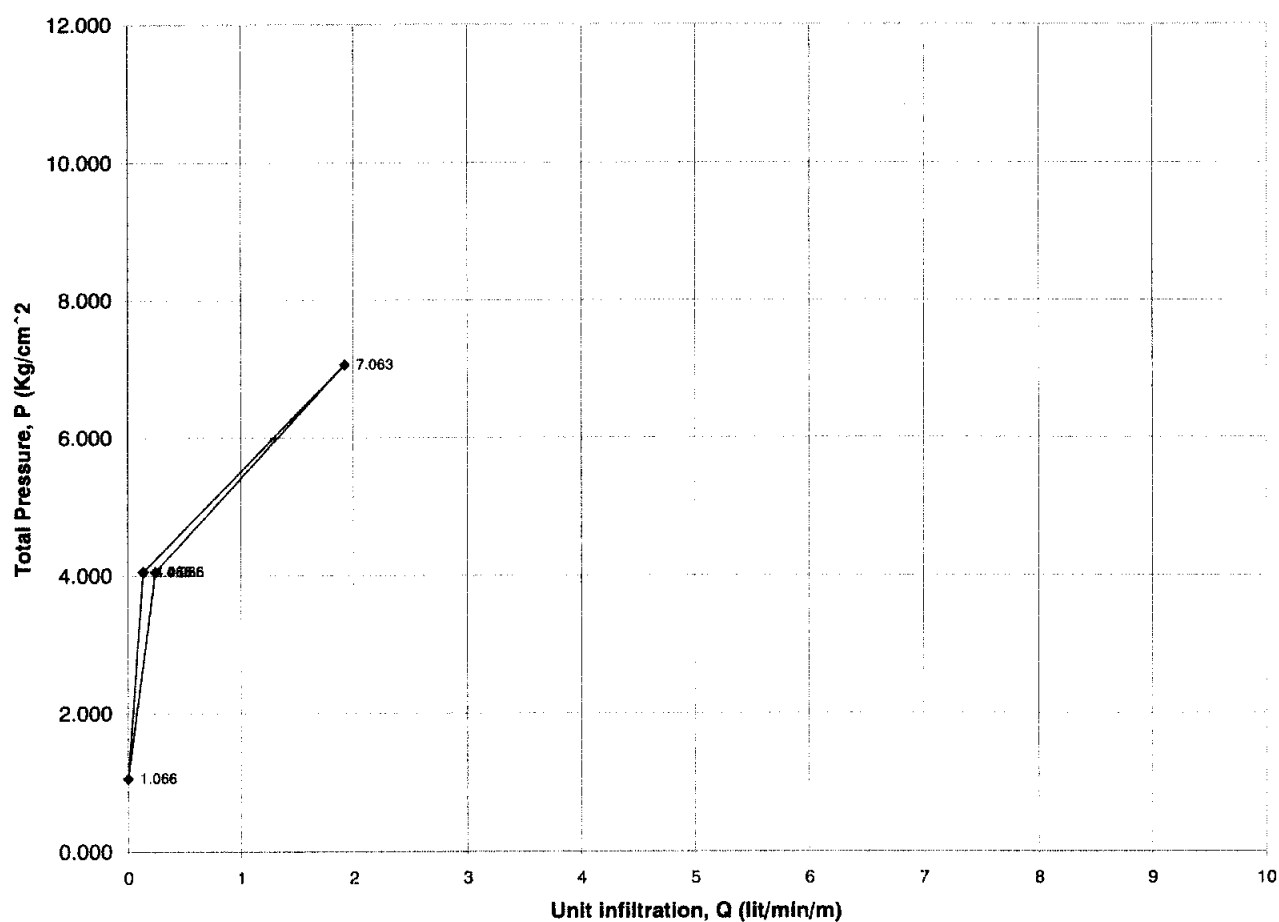
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-1</b>	Test Interval:	<b>85-90 m</b>
Water Level:	<b>0.0 m</b>	Gauge Height:	<b>0.66 m</b>
Radius of Hole:	<b>0.038 m</b>	Test Length:	<b>5 m</b>
Packer Type:	<b>Mechanical Single</b>	Injection pipe Diameter:	<b>0.046 m</b>
Lugeon Value:	<b>3.730 lit/min/m/Mpa</b>	Injection pipe Length (15+85):	<b>100 m</b>
Permeability:	<b>5.595E-05 cm/sec</b>	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=Po+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	4.032E-05	4.066	4065.960	1.200	0.240	0.590	7.640E-06
7	2.580E-03	7.063	7063.420	9.600	1.920	2.718	3.518E-05
4	1.246E-05	4.066	4065.988	0.667	0.133	0.328	4.247E-06
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



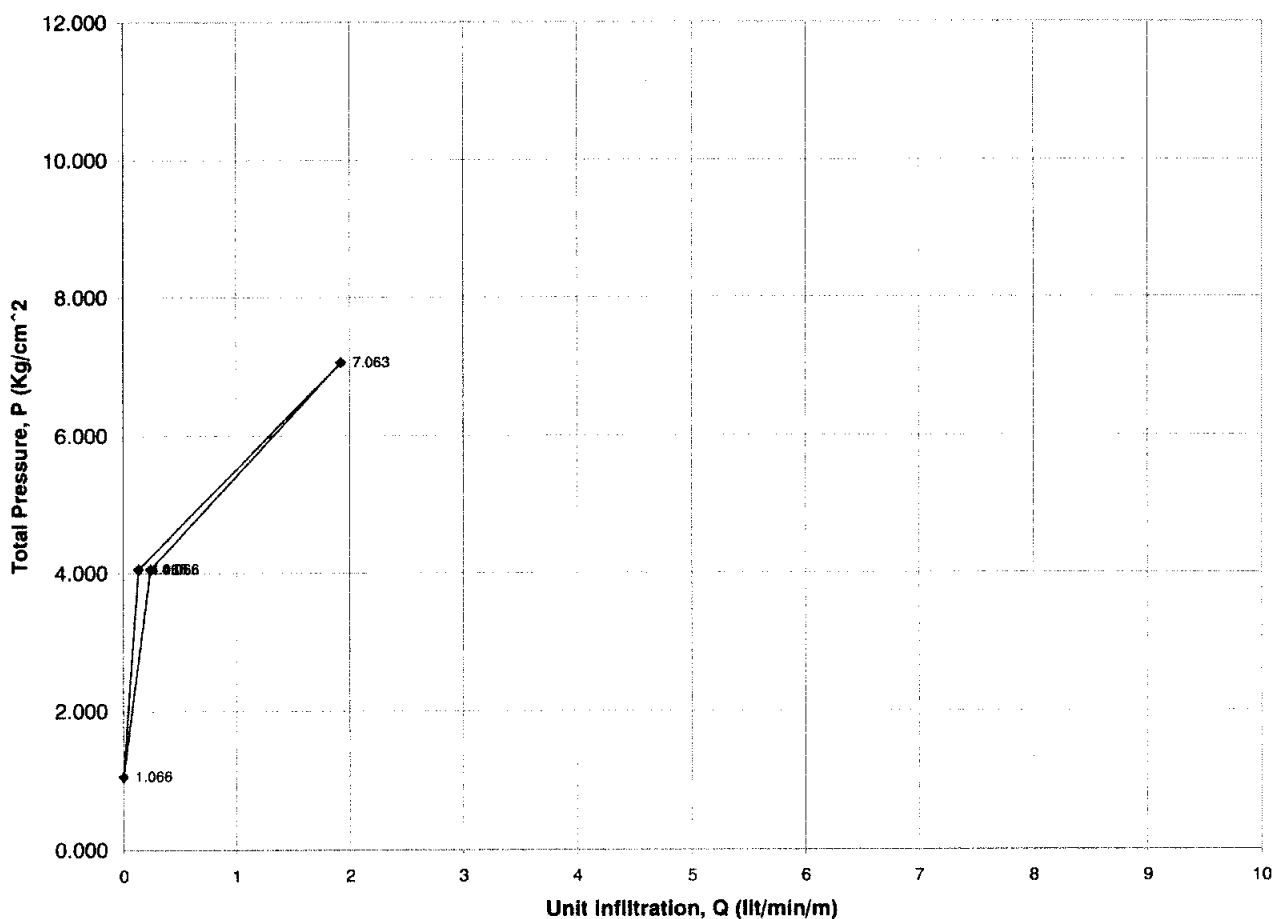
**Lugeon Value= 3.73**

**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*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: 3.450 lit/min/m/Mpa</b> <b>Permeability: 5.175E-05 cm/sec</b>				<b>STRUCTURE: POWERHOUSE</b> <b>Test Interval: 90-95 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+90): 105 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	4.234E-05	4.066	4065.958	1.200	0.240	0.590	7.640E-06
7	2.710E-03	7.063	7063.290	9.600	1.920	2.718	3.518E-05
4	1.308E-05	4.066	4065.987	0.667	0.133	0.328	4.247E-06
1	0.000E+00	1.066	1066.000	0.000	0.000	0.000	0.000E+00

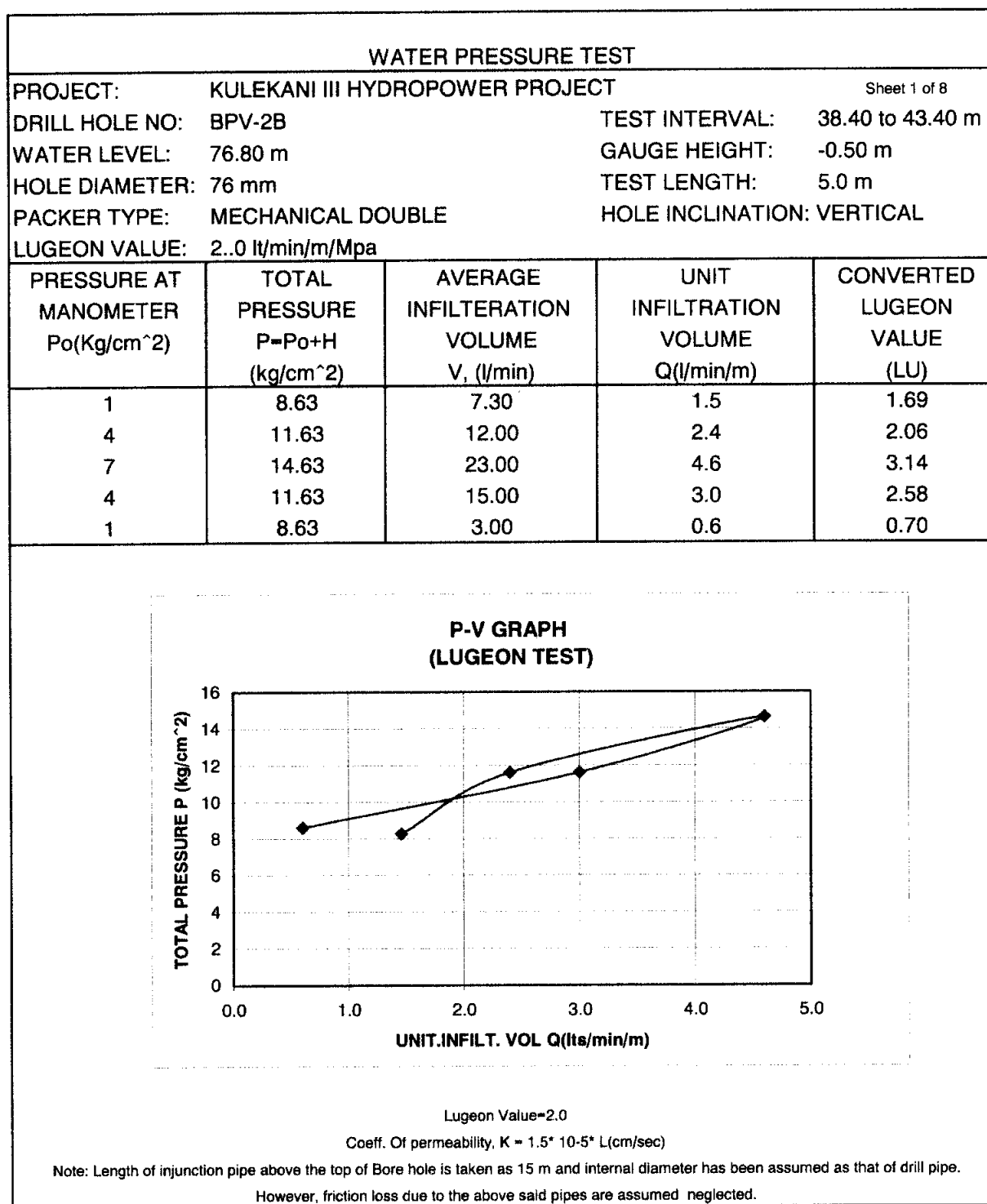
### LUGEON TEST P-Q GRAPH



**Lugeon Value= 3.45**

**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

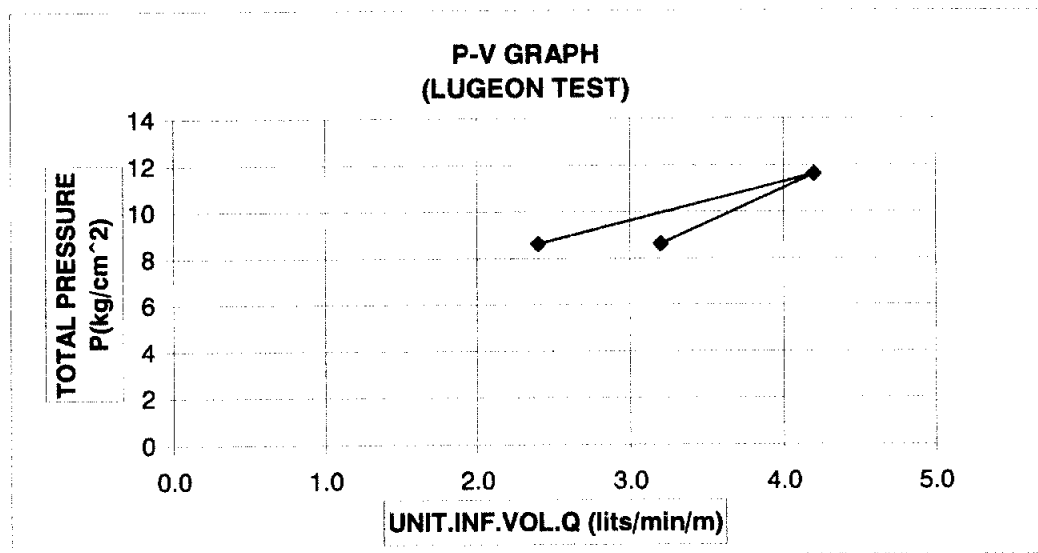
**Note:** Length of Injection Pipe above the top of Bore hole has been taken as 15 m and internal diameter has been assumed as that of drill pipe. Water from bore hole was coming out due to high water table, therefore water level (static water head) = 0.0 m.



**EAST DRILLING COMPANY (P) LTD.**  
**WATER PRESSURE TEST**

<b>PROJECT:</b> KULEKANI III HYDROPOWER PROJECT		Sheet 2 of 8
<b>DRILL HOLE NO:</b> BPV-2B	<b>TEST INTERVAL:</b> 41.20 to 46.20m	
<b>WATER LEVEL:</b> 76.90 m	<b>GAUGE HEIGHT:</b> -0.50 m	
<b>HOLE DIAMETER:</b> 76 mm	<b>TEST LENGTH:</b> 5.0 m	
<b>PACKER TYPE:</b> MECHANICAL DOUBLE	<b>HOLE INCLINATION:</b> VERTICAL	
<b>LUGEON VALUE:</b> 3.15 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 $V, (l/min)$	UNIT INFILTRATION VOLUME $Q(l/min/m)$	CONVERTED LUGEON VALUE (LU)
1	8.64	12.00	2.4	2.78
4	11.64	21.00	4.2	3.61
1	8.64	11.00	3.2	3.70



Lugeon Value=3.15

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

Note: Length of injuncion 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 8

PROJECT: KULEKANI III HYDROPOWER PROJECT

DRILL HOLE NO: BPV-2B TEST INTERVAL: 46.0 to 51m

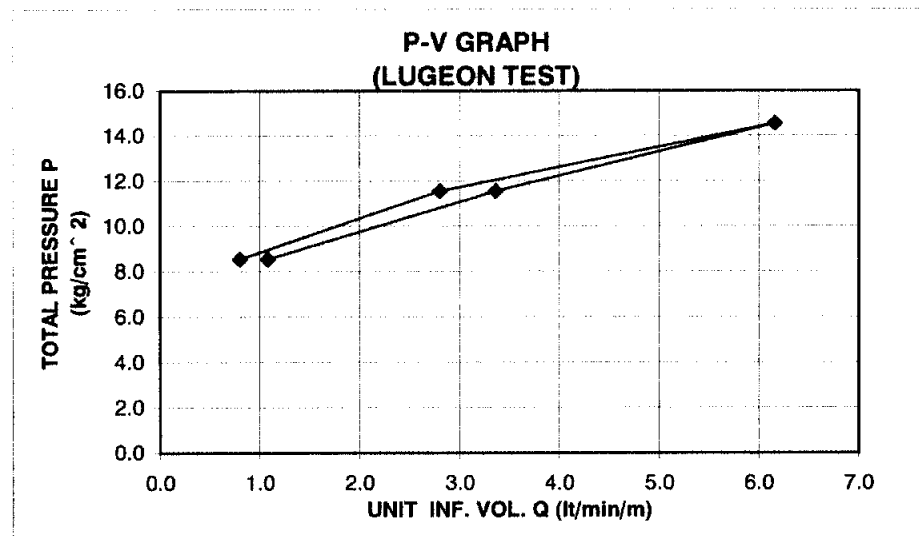
WATER LEVEL: 76.10 m GAUGE HEIGHT: -0.50 m

HOLE DIAMETER: 76 mm TEST LENGTH: 5.0 m

PACKER TYPE: MECHANICAL DOUBLE HOLE INCLINATION: VERTICAL

LUGEON VALUE: 2.1 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 $V, (l/min)$	UNIT INFILTRATION VOLUME $Q(l/min/m)$	CONVERTED LUGEON VALUE (LU)
1	8.56	5.40	1.1	1.26
4	11.56	16.80	3.4	2.91
7	14.56	30.80	6.2	4.23
4	11.56	14.00	2.8	2.42
1	8.56	4.00	0.8	0.93

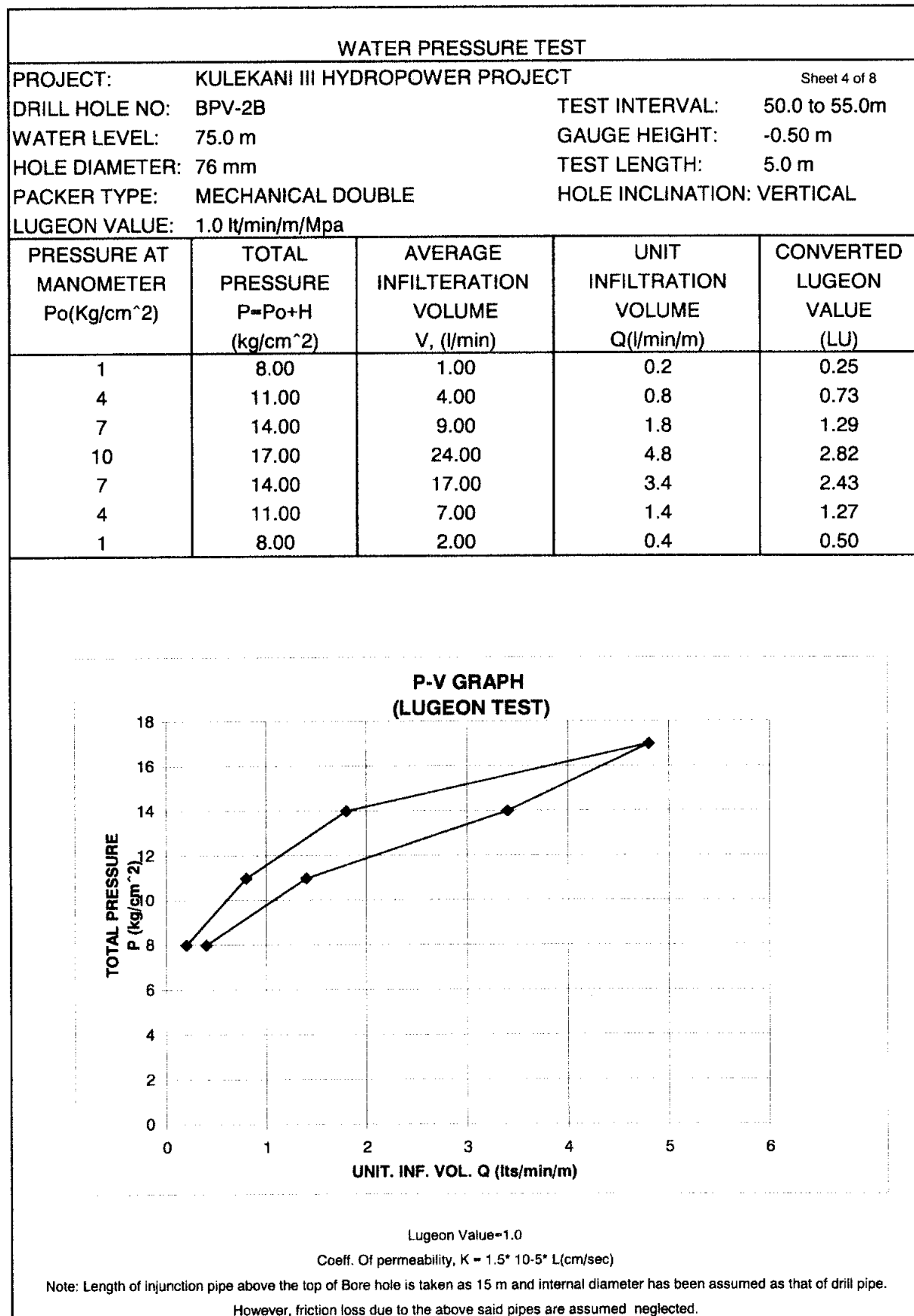


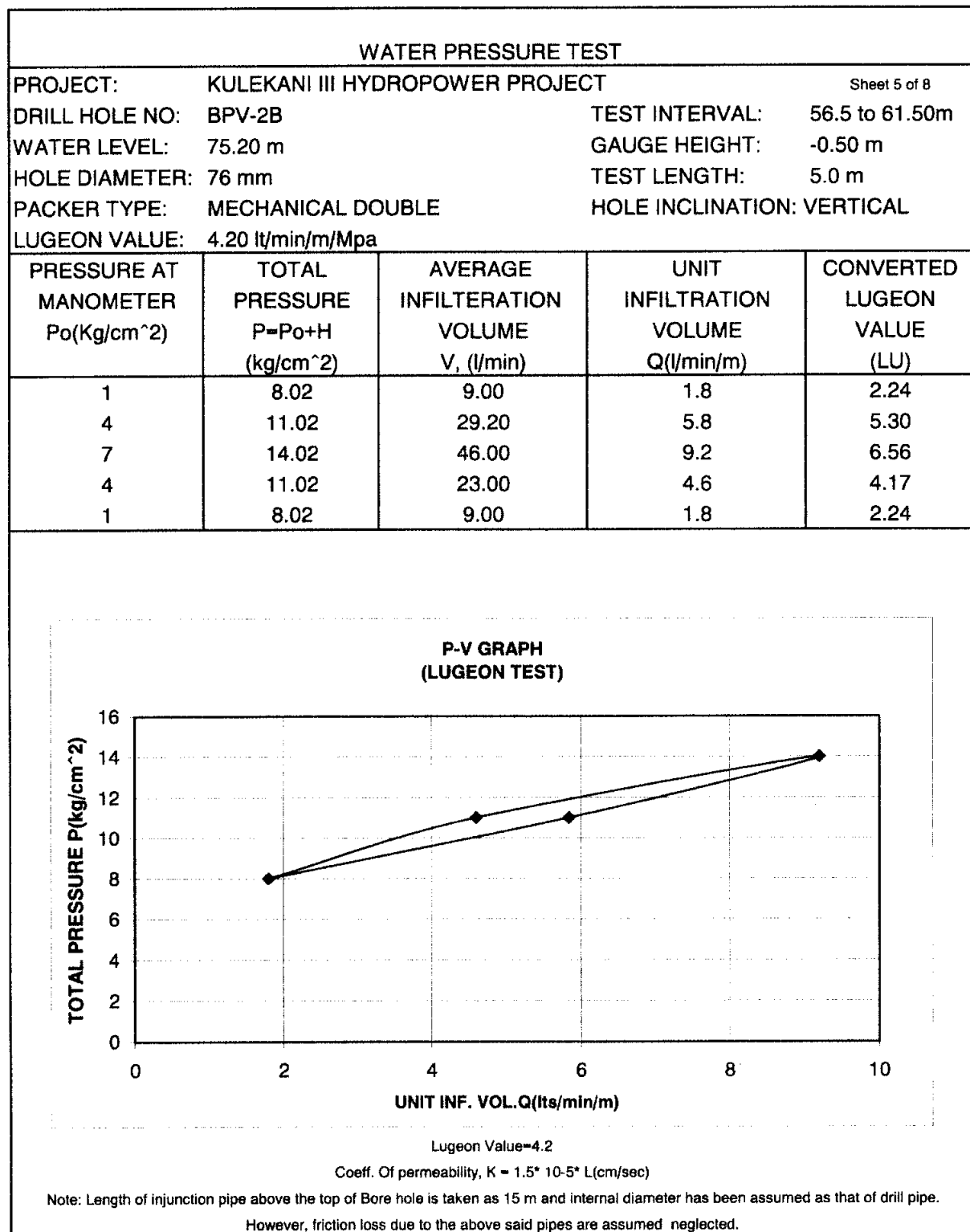
Lugeon Value=2.10

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

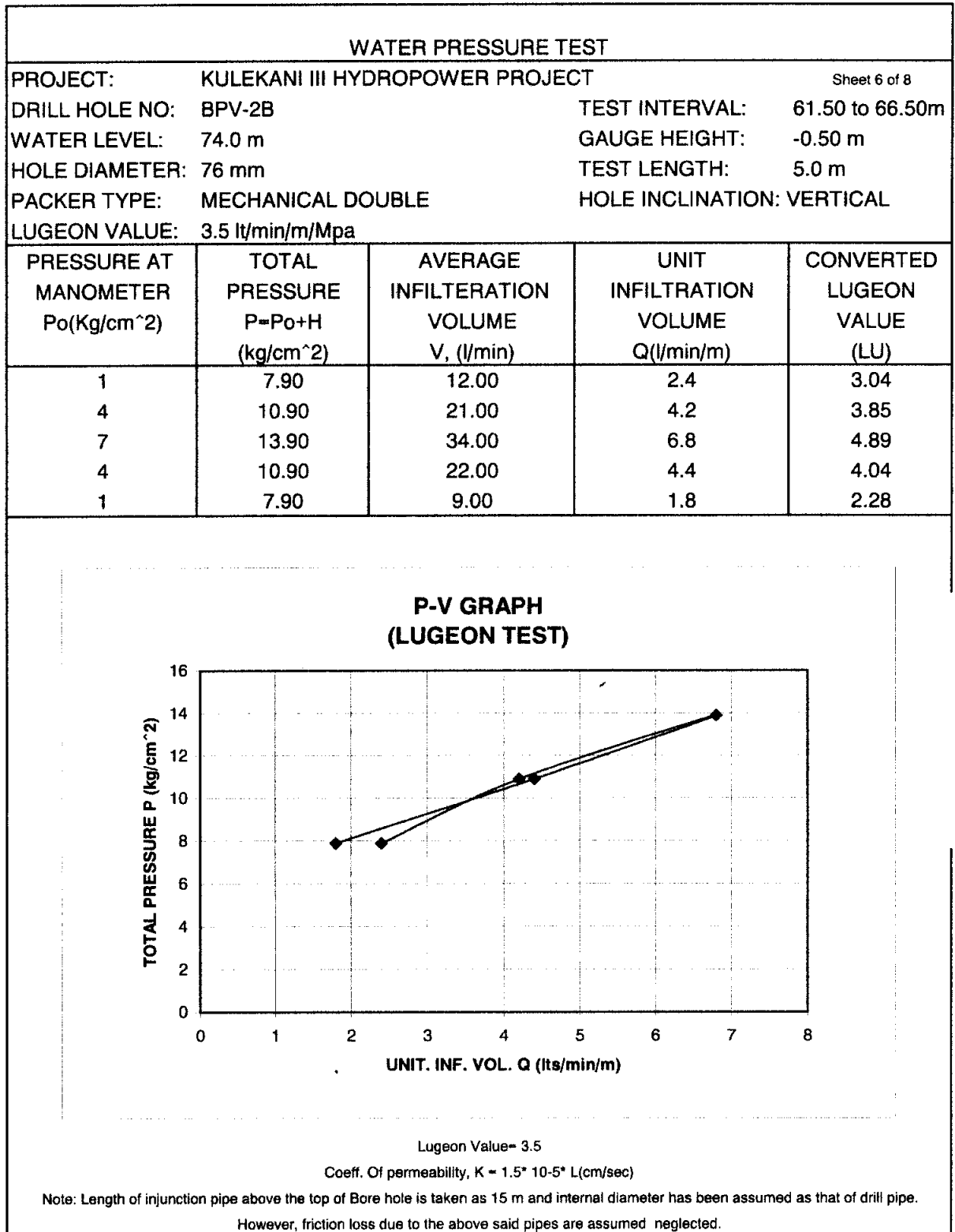
Note: Length of injunction pipe above the top of Bore hole is taken as 15 m and internal diameter has been assumed as that of drill pipe.

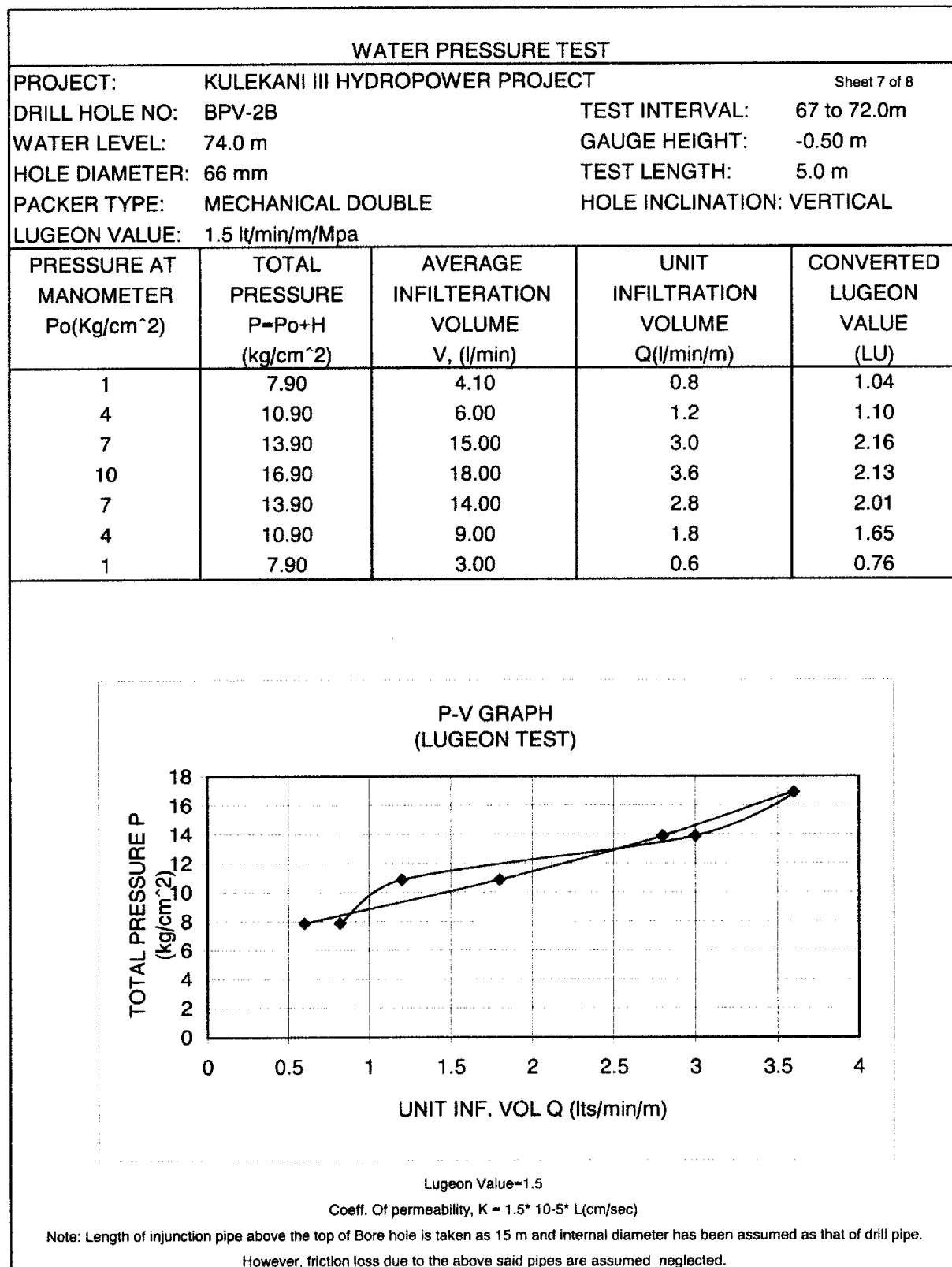
However, friction loss due to the above said pipes are assumed neglected.

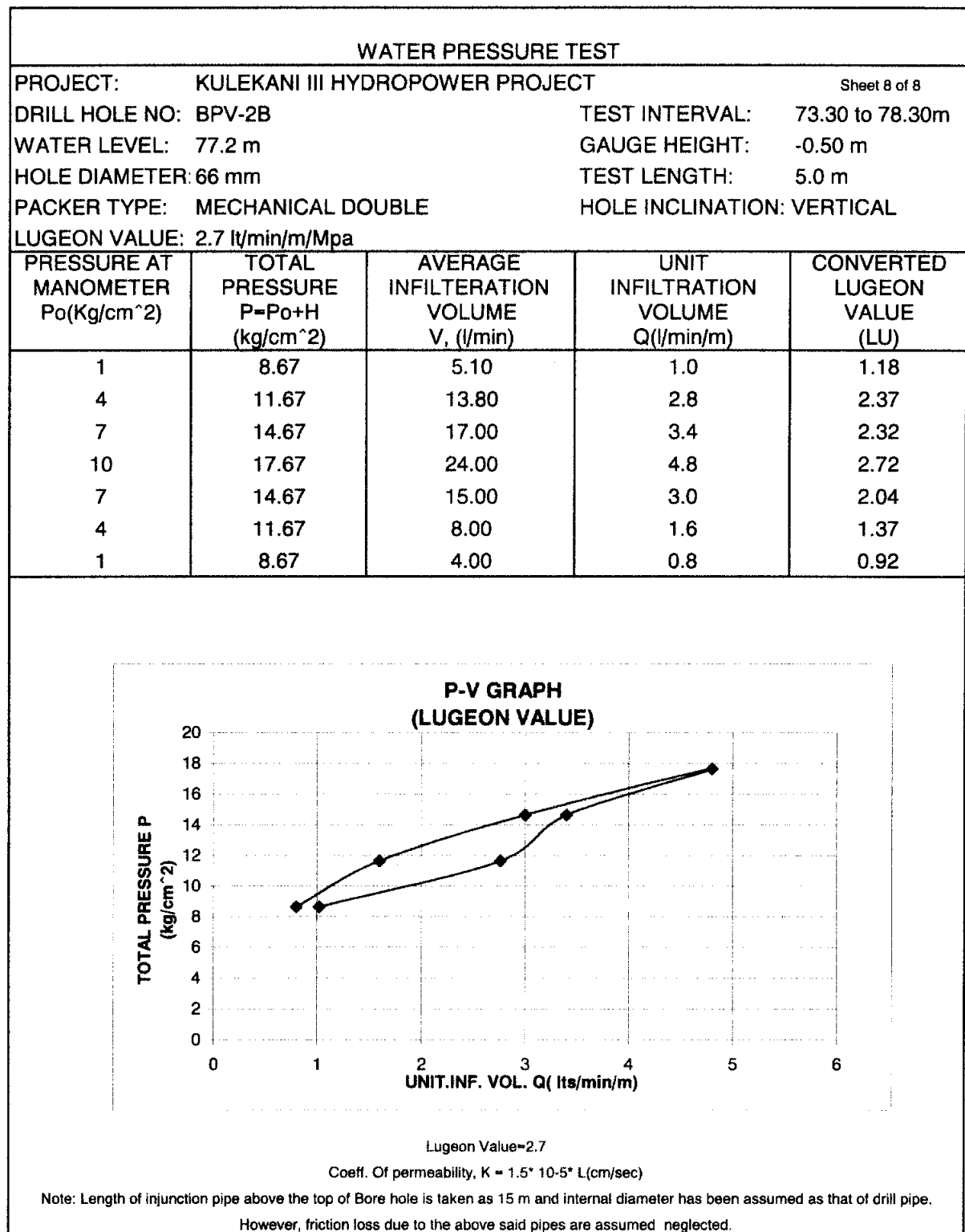








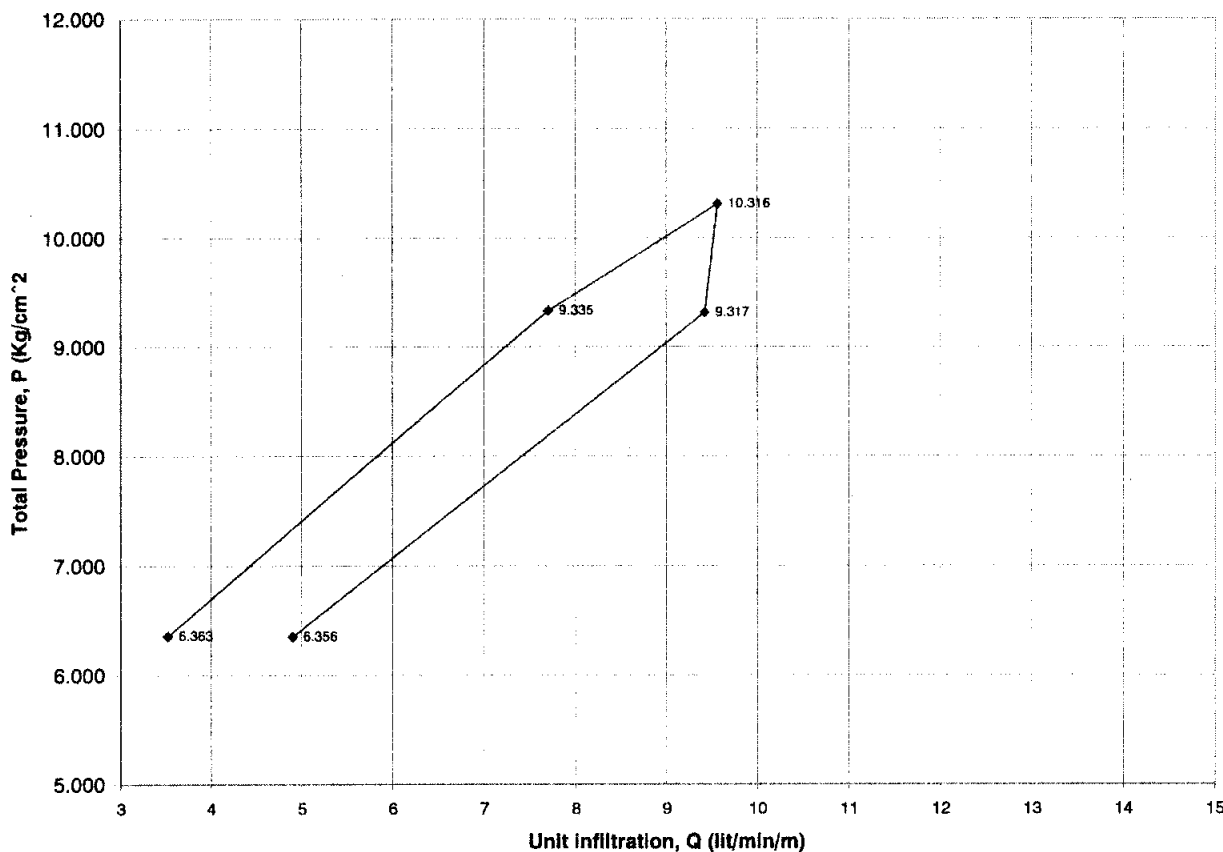




Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-3</b>	Test Interval:	<b>69.8-74.8 m</b>
Water Level:	<b>52.5 m</b>	Gauge Height:	<b>1.2 m</b>
Radius of Hole:	<b>0.038 m</b>	Test Length:	<b>5 m</b>
Packer Type:	<b>Mechanical Single</b>	Injection pipe Diameter:	<b>0.046 m</b>
Lugeon Value:	<b>9.000 lit/min/m/Mpa</b>	Injection pipe Length (15+69.8):	<b>84.8 m</b>
Permeability:	<b>1.350E-04 cm/sec</b>	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=Po+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, (lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	7.35E-03	6.363	6362.645	17.600	3.520	5.532	7.161E-05
4	3.519E-02	9.335	9334.805	38.500	7.700	8.249	1.068E-04
5	5.425E-02	10.316	10315.749	47.800	9.560	9.267	1.200E-04
4	5.267E-02	9.317	9317.326	47.100	9.420	10.110	1.309E-04
1	1.425E-02	6.356	6355.748	24.500	4.900	7.710	9.979E-05

### LUGEON TEST P-Q GRAPH



Lugeon Value= 9

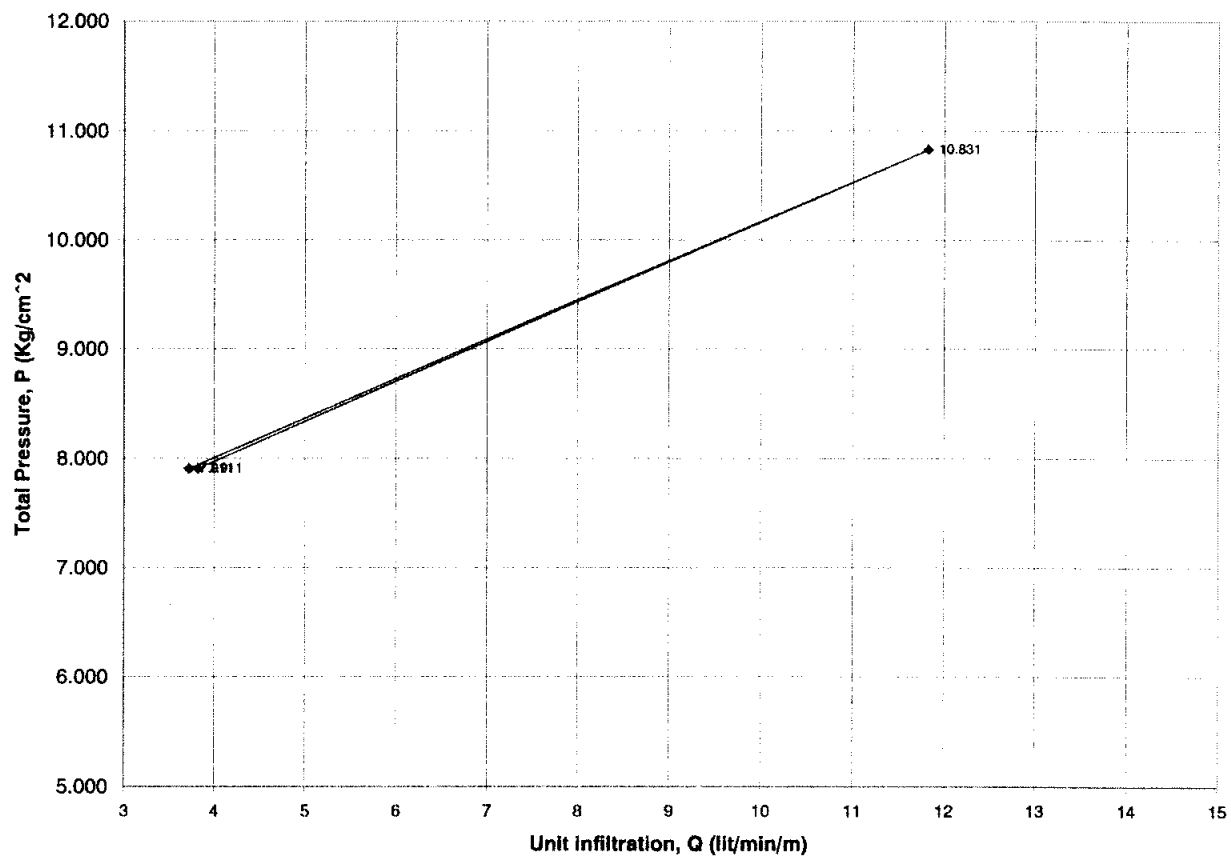
Coeff. Of permeability,  $K = 1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-3</b>	Test Interval:	<b>75.7-80.7</b> m
Water Level:	<b>68.0</b> m	Gauge Height:	<b>1.2</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>9.500</b> lit/min/m/Mpa	Injection pipe Length (15+75.7):	<b>90.7</b> m
Permeability:	<b>1.425E-04</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=Po+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>a</sub> (lit/min)	Unit Infiltration Volume, Q,(lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	8.79E-03	7.911	7911.214	18.600	3.720	4.702	6.086E-05
4	8.870E-02	10.831	10831.297	59.100	11.820	10.913	1.413E-04
1	9.265E-03	7.911	7910.735	19.100	3.820	4.829	6.250E-05

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 9.5**

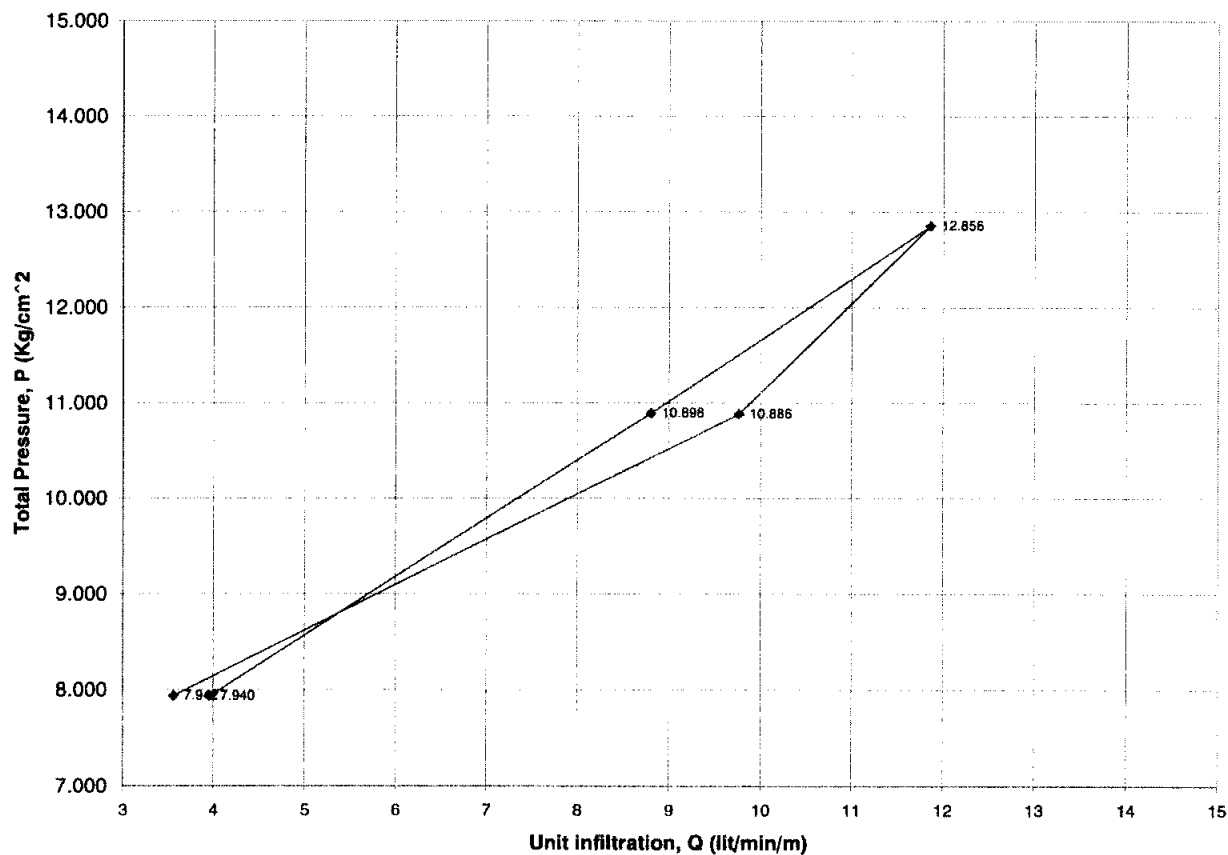
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.:	<b>BPV-3</b>			Test Interval:	<b>80.3-85.3</b> m
Water Level:	<b>68.3</b>	m		Gauge Height:	<b>1.2</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>7.370</b>	lit/min/m/Mpa		Injection pipe Length (15+80.3):	<b>95.3</b> m
Permeability:	<b>1.106E-04</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=Po+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>a</sub> (lit/min)	Unit Infiltration Volume, Q <sub>a</sub> (lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	8.45E-03	7.942	7941.545	17.800	3.560	4.483	5.802E-05
4	6.355E-02	10.886	10886.454	48.800	9.760	8.965	1.160E-04
6	9.383E-02	12.856	12856.166	59.300	11.860	9.225	1.194E-04
4	5.166E-02	10.898	10898.340	44.000	8.800	8.075	1.045E-04
1	1.046E-02	7.940	7939.539	19.800	3.960	4.988	6.456E-05

### LUGEON TEST P-Q GRAPH



Lugeon Value= 7.37

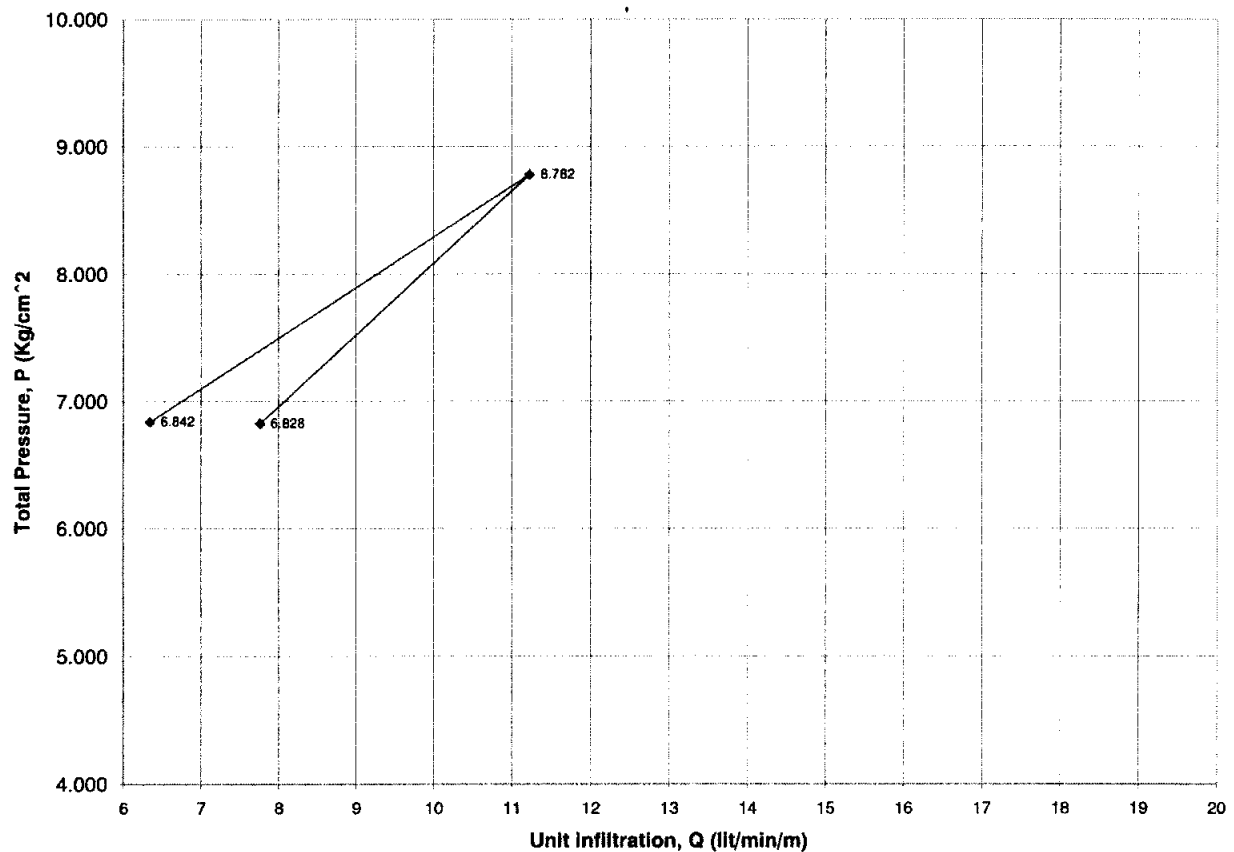
Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-3</b>	Test Interval:	<b>85.3-90.3</b> m
Water Level:	57.5 m	Gauge Height:	1.2 m
Radius of Hole:	0.038 m	Test Length:	5 m
Packer Type:	Mechanical Single	Injection pipe Diameter:	0.046 m
Lugeon Value:	<b>14.300</b> lit/min/m/Mpa	Injection pipe Length (15+85.3):	100.3 m
Permeability:	<b>2.145E-04</b> cm/sec	Hole Inclination:	Vertical

Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=Po+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	4.23E-02	6.828	6827.721	38.800	7.760	11.365	1.471E-04
3	8.839E-02	8.782	8781.614	56.100	11.220	12.777	1.654E-04
1	2.822E-02	6.842	6841.779	31.700	6.340	9.267	1.199E-04

### LUGEON TEST P-Q GRAPH



0.272727273

Lugeon Value= 14.3

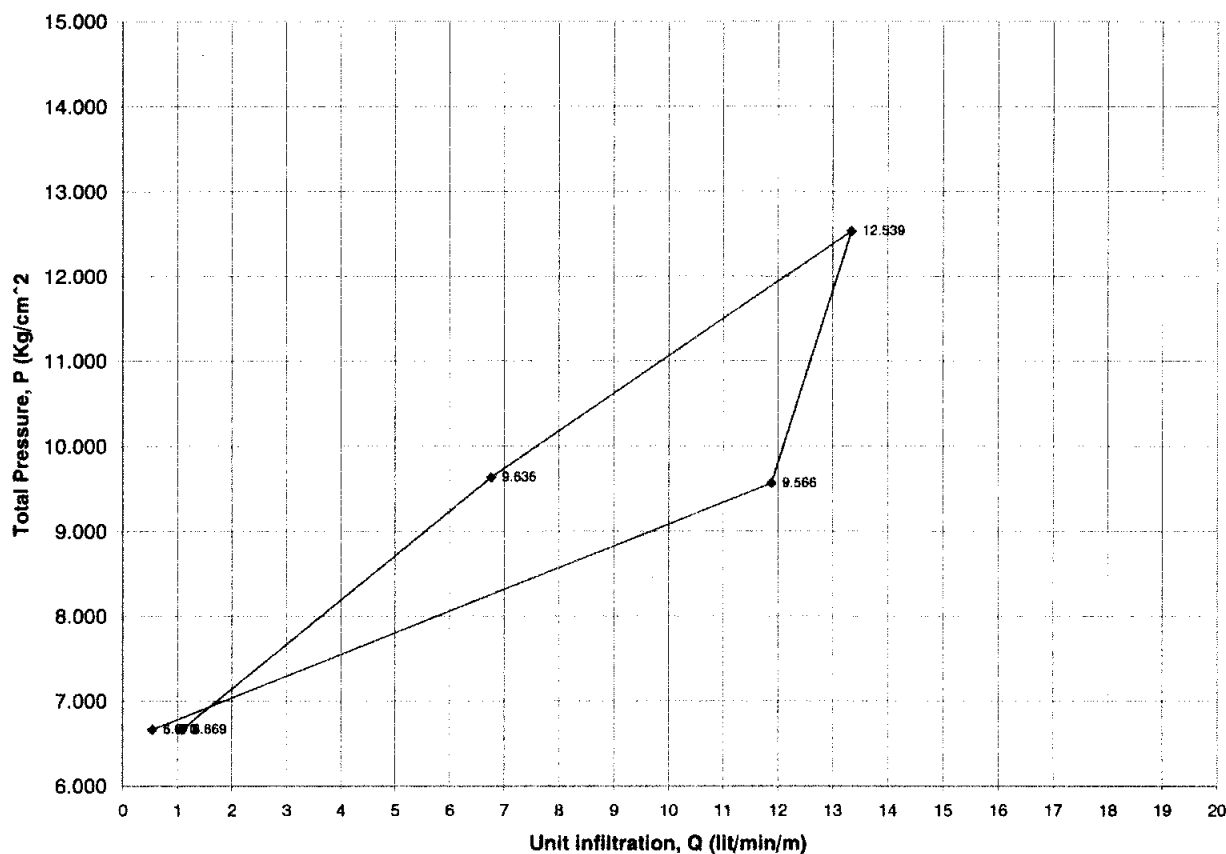
Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE:		<b>POWERHOUSE</b>	
Drill Hole NO.: <b>BPV-3</b>				Test Interval:		<b>90.3-95.3</b>	m
Water Level: <b>55.5</b> m				Gauge Height:		<b>1.2</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>7.600</b> lit/min/m/Mpa				Injection pipe Length (15+90.3):		<b>105.3</b>	m
Permeability: <b>1.140E-04</b> cm/sec				Hole Inclination:		Vertical	

	Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=Po+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		8.60E-04	6.669	6669.140	5.400	1.080	1.619	2.096E-05
4		3.368E-02	9.636	9636.316	33.800	6.760	7.015	9.080E-05
7		1.312E-01	12.539	12538.829	66.700	13.340	10.639	1.377E-04
4		1.040E-01	9.566	9565.970	59.400	11.880	12.419	1.607E-04
1		2.149E-04	6.670	6669.785	2.700	0.540	0.810	1.048E-05

### LUGEON TEST P-Q GRAPH



Lugeon Value= 7.6

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

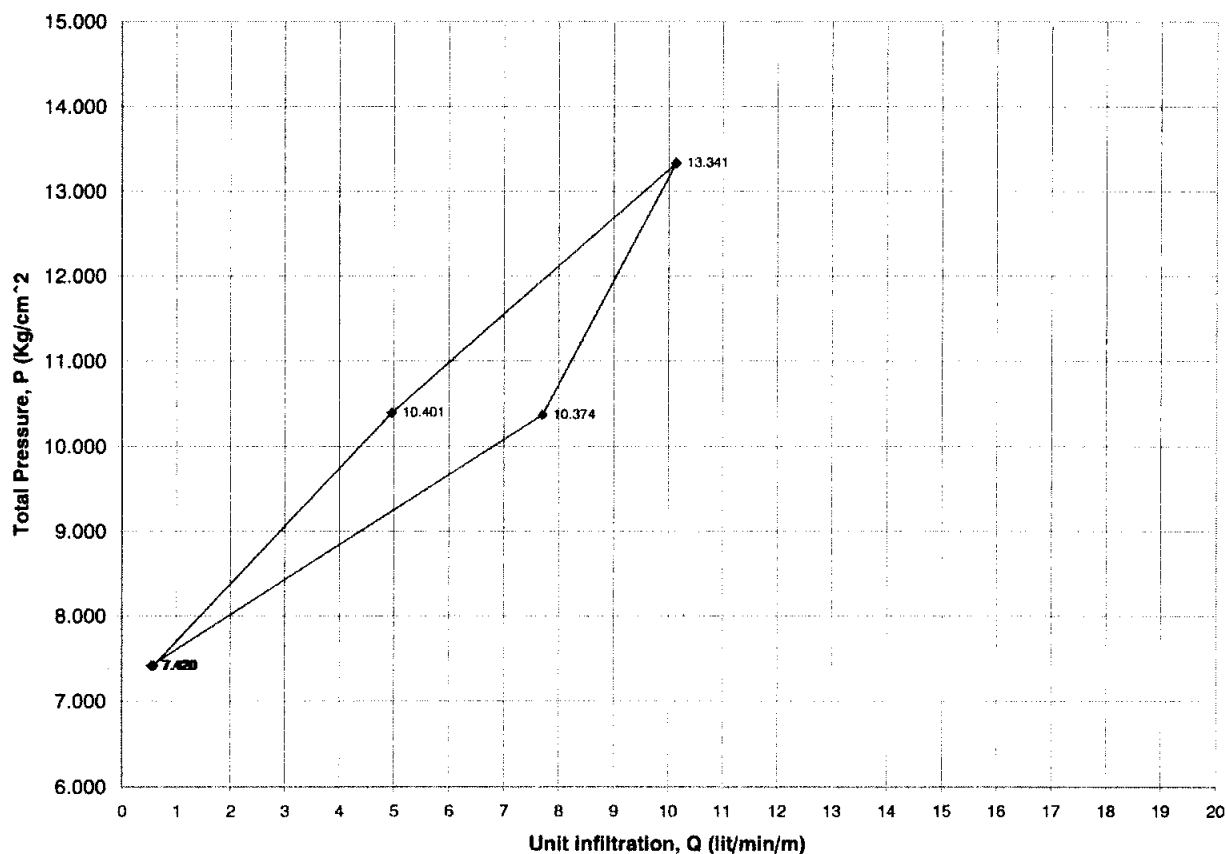
Note: Length of Injection Pipe above the top of Bore hole has been taken as 15 m and internal diameter has been assumed as that of drill pipe. Water from bore hole was coming out due to high water table, therefore water level (static water head) = 0.0 m.



Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-3</b>	Test Interval:	<b>95-100 m</b>
Water Level:	<b>63.0 m</b>	Gauge Height:	<b>1.2 m</b>
Radius of Hole:	<b>0.038 m</b>	Test Length:	<b>5 m</b>
Packer Type:	<b>Mechanical Single</b>	Injection pipe Diameter:	<b>0.046 m</b>
Lugeon Value:	<b>4.400 lit/min/m/Mpa</b>	Injection pipe Length (15+95):	<b>110 m</b>
Permeability:	<b>6.600E-05 cm/sec</b>	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=Po+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	2.59E-04	7.420	7419.741	2.900	0.580	0.782	1.012E-05
4	1.894E-02	10.401	10401.057	24.800	4.960	4.769	6.172E-05
7	7.917E-02	13.341	13340.829	50.700	10.140	7.601	9.836E-05
4	4.565E-02	10.374	10374.347	38.500	7.700	7.422	9.607E-05
1	2.245E-04	7.420	7419.775	2.700	0.540	0.728	9.420E-06

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 4.4**

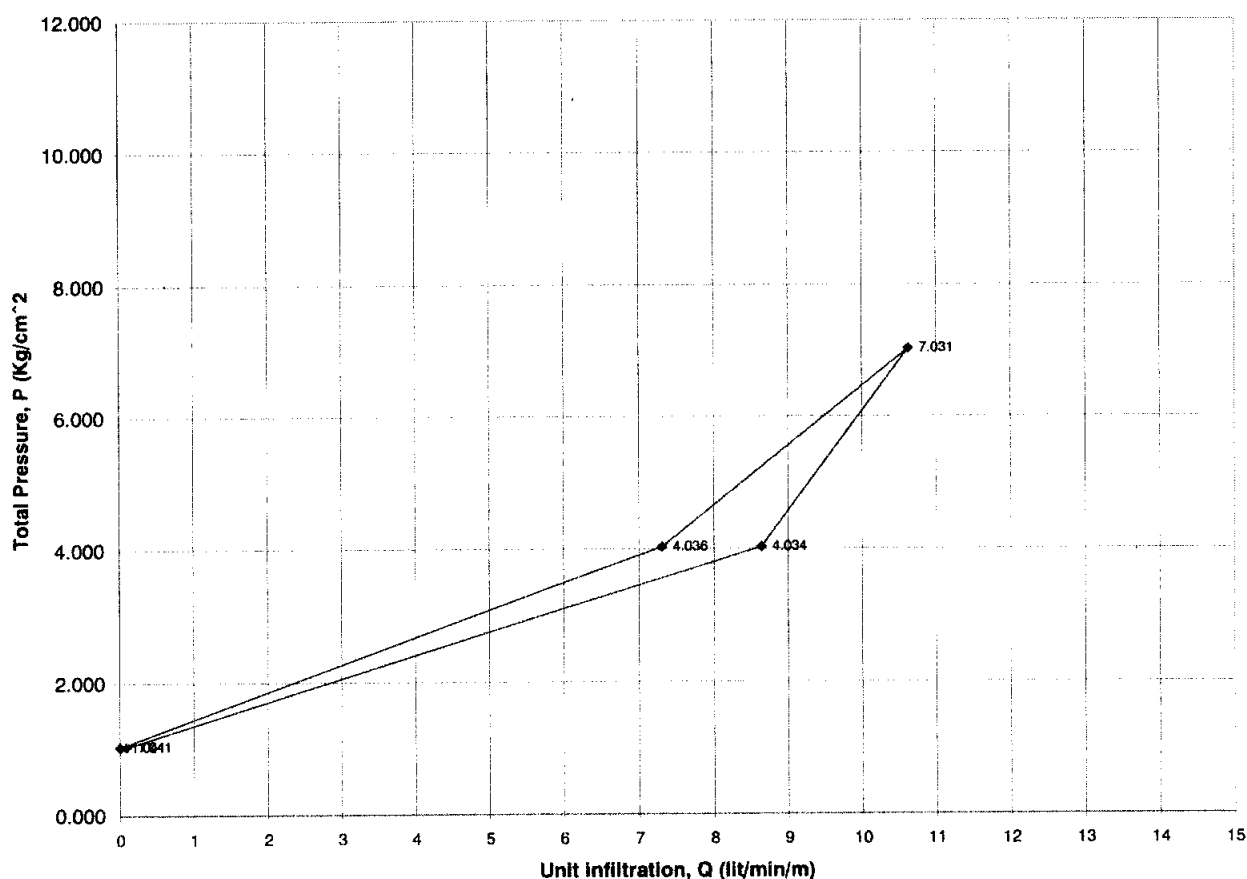
Coeff. Of permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project: <b>KULEKHANI-III HPP</b>				STRUCTURE: <b>POWERHOUSE</b>	
Drill Hole NO.:	<b>BPH-1</b>			Test Interval:	<b>11.8-15</b> m
Water Level:	0.0	m		Gauge Height:	0.41 m
Radius of Hole:	0.038	m		Test Length:	3.52 m
Packer Type:	Mechanical Single			Injection pipe Diameter:	0.046 m
Lugeon Value:	<b>13.880</b>	lit/min/m/Mpa		Injection pipe Length (15+11.48):	26.48 m
Permeability:	<b>1.804E-04</b>	cm/sec		Hole Inclination:	Horizontal

Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=Po+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	6.67E-07	1.041	1040.999	0.300	0.085	0.819	9.835E-06
4	6.852E-03	4.034	4034.148	30.400	8.636	21.408	2.572E-04
7	1.037E-02	7.031	7030.629	37.400	10.625	15.112	1.815E-04
4	4.897E-03	4.036	4036.103	25.700	7.301	18.090	2.173E-04
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



Lugeon Value= 13.88

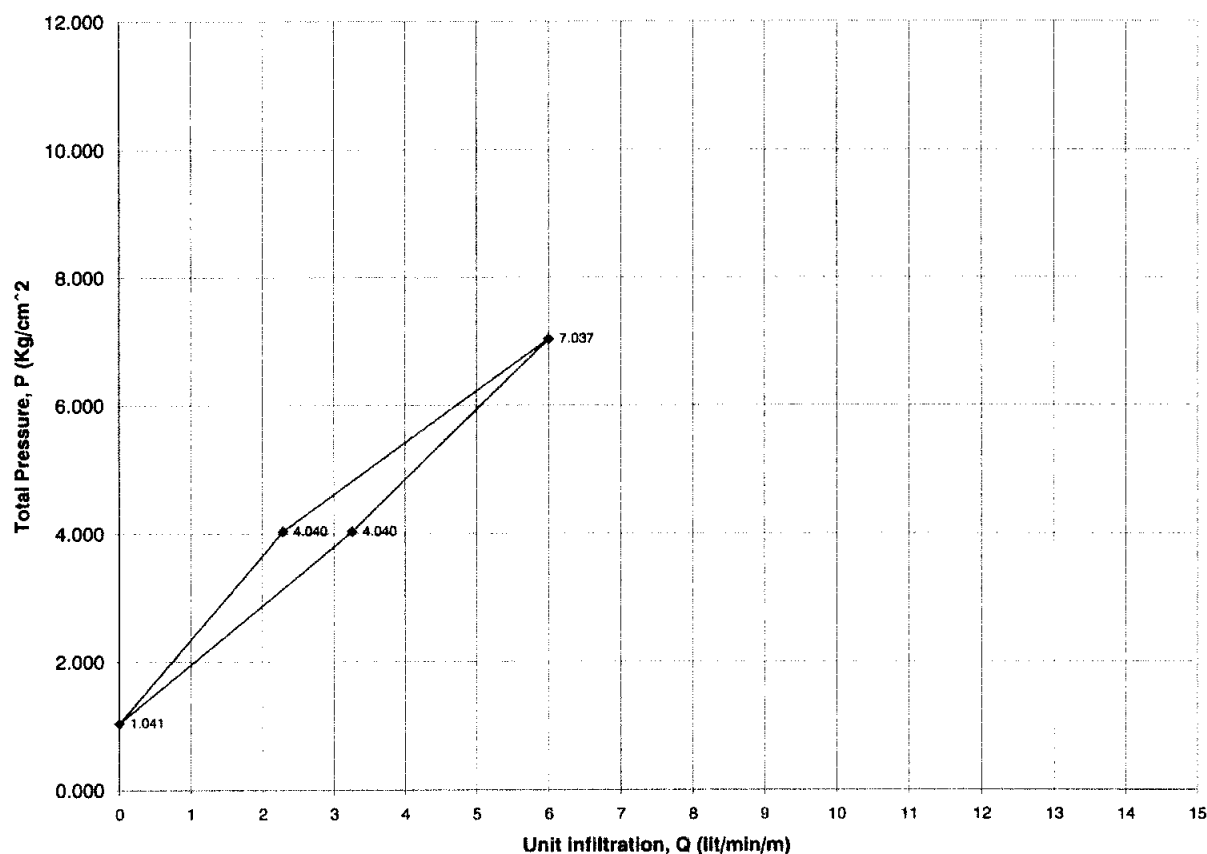
Coeff. Of permeability,  $K = 1.3 \times 10^{-5} \cdot Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>		STRUCTURE:	<b>POWERHOUSE</b>	
Drill Hole NO.:	<b>BPH-1</b>		Test Interval:	<b>15-18.5</b>	<b>m</b>
Water Level:	<b>0.0</b>	<b>m</b>	Gauge Height:	<b>0.41</b>	<b>m</b>
Radius of Hole:	<b>0.038</b>	<b>m</b>	Test Length:	<b>3.5</b>	<b>m</b>
Packer Type:	<b>Mechanical Single</b>		Injection pipe Diameter:	<b>0.046</b>	<b>m</b>
Lugeon Value:	<b>9.600</b>	<b>lit/min/m/Mpa</b>	Injection pipe Length (15+15):	<b>30</b>	<b>m</b>
Permeability:	<b>1.248E-04</b>	<b>cm/sec</b>	Hole Inclination:	<b>Horizontal</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	1.041	1041.000	0.000	0.000	0.000	0.000E+00
4	1.092E-03	4.040	4039.908	11.400	3.257	8.062	9.673E-05
7	3.704E-03	7.037	7037.296	21.000	6.000	8.526	1.023E-04
4	5.376E-04	4.040	4040.462	8.000	2.286	5.657	6.787E-05
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



Lugeon Value= 9.6

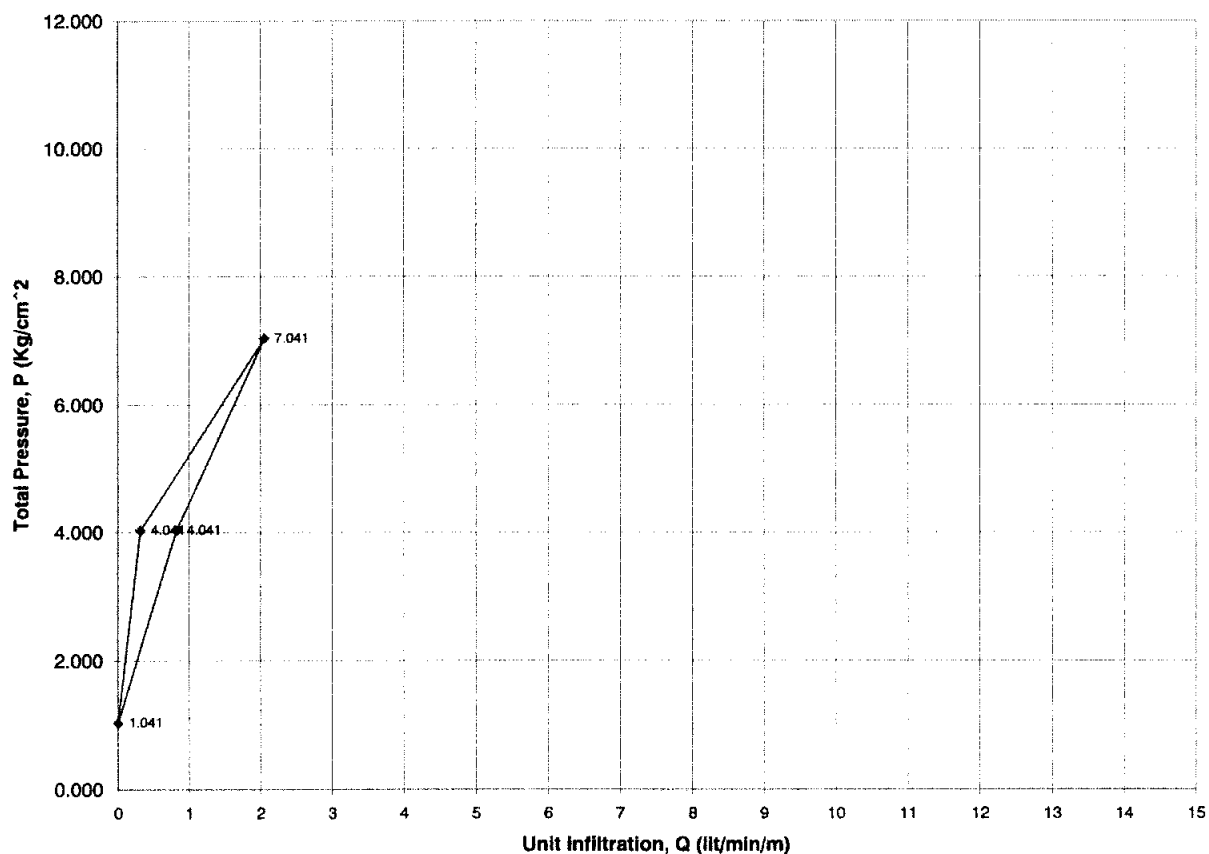
Coeff. Of permeability, K=  $1.3 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPH-1</b>	Test Interval:	<b>18-21.15</b> m
Water Level:	<b>0.0</b> m	Gauge Height:	<b>0.41</b> m
Radius of Hole:	<b>0.038</b> m	Test Length:	<b>3.52</b> m
Packer Type:	<b>Mechanical Single</b>	Injection pipe Diameter:	<b>0.046</b> m
Lugeon Value:	<b>3.839</b> lit/min/m/Mpa	Injection pipe Length (15*17.63):	<b>32.63</b> m
Permeability:	<b>4.991E-05</b> cm/sec	Hole Inclination:	<b>Horizontal</b>

Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=Po+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>a</sub> (lit/min)	Unit Infiltration Volume, Q <sub>a</sub> (lit/min/m)	Converted Lugeon Value (LU)	Converted Coeff. of Permeability, K, (cm/sec)
1	0.00E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00
4	7.578E-05	4.041	4040.924	2.880	0.818	2.025	2.432E-05
7	4.736E-04	7.041	7040.526	7.200	2.045	2.905	3.490E-05
4	1.106E-05	4.041	4040.989	1.100	0.313	0.773	9.290E-06
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 3.839**

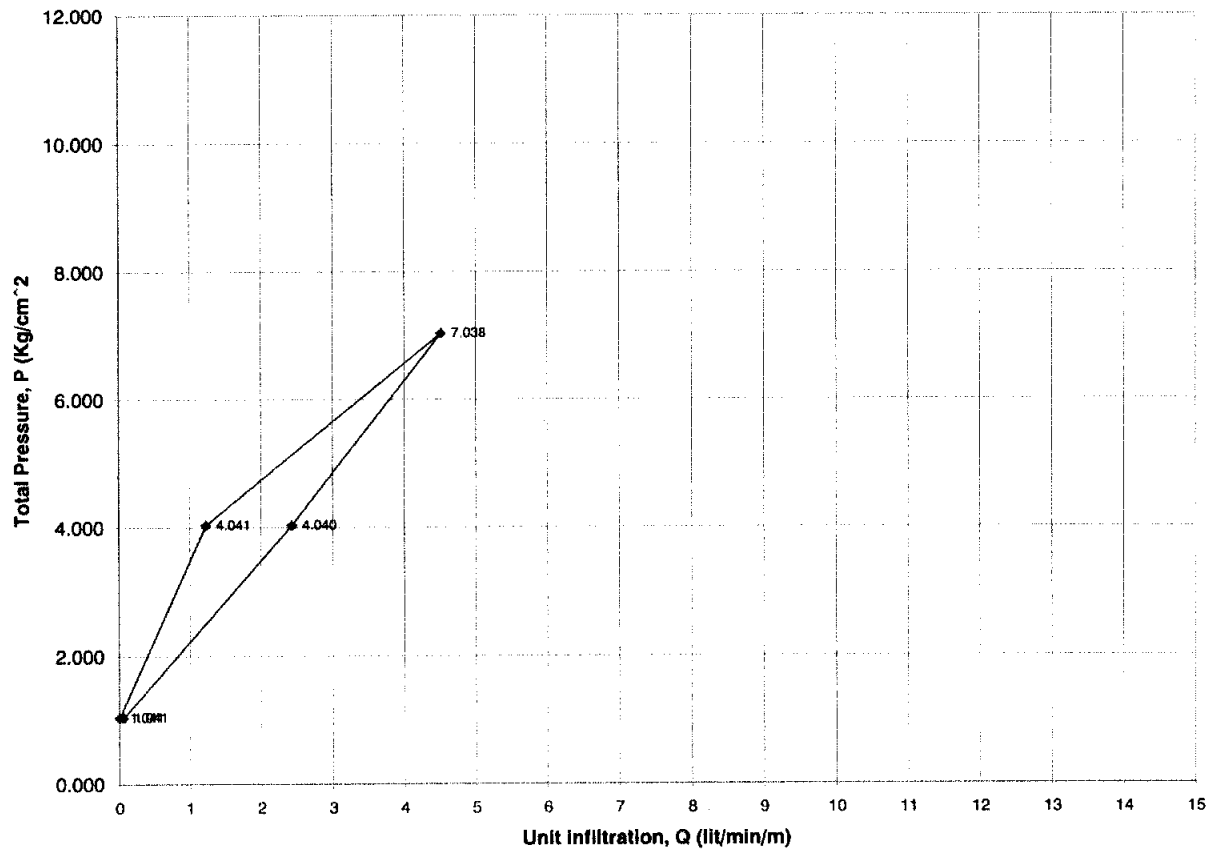
**Coeff. Of permeability, K= 1.3\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPH-1</b>	Test Interval:	<b>21-24.5 m</b>
Water Level:	<b>0.0 m</b>	Gauge Height:	<b>0.41 m</b>
Radius of Hole:	<b>0.038 m</b>	Test Length:	<b>3.5 m</b>
Packer Type:	<b>Mechanical Single</b>	Injection pipe Diameter:	<b>0.046 m</b>
Lugeon Value:	<b>7.780 lit/min/m/Mpa</b>	Injection pipe Length (15+21):	<b>36 m</b>
Permeability:	<b>1.011E-04 cm/sec</b>	Hole Inclination:	<b>Horizontal</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	4.03E-07	1.041	1041.000	0.200	0.057	0.549	6.586E-06
4	7.283E-04	4.040	4040.272	8.500	2.429	6.011	7.212E-05
7	2.516E-03	7.038	7038.484	15.800	4.514	6.414	7.695E-05
4	1.838E-04	4.041	4040.816	4.270	1.220	3.019	3.622E-05
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



Lugeon Value= 7.78

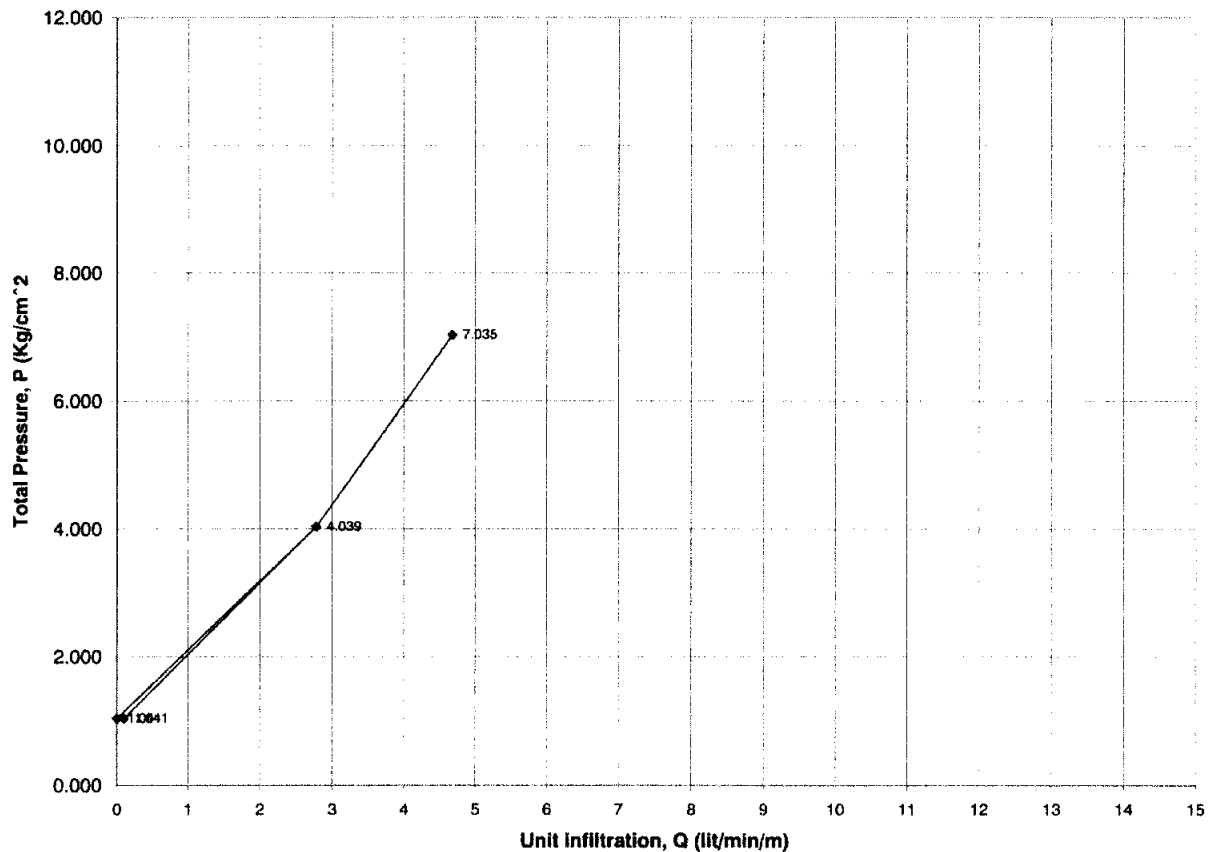
Coeff. Of permeability, K=  $1.3 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project:	<b>KULEKHANI-III HPP</b>		STRUCTURE:	<b>POWERHOUSE</b>	
Drill Hole NO.:	<b>BPH-1</b>		Test Interval:	<b>25-30</b>	<b>m</b>
Water Level:	<b>0.0</b>	<b>m</b>	Gauge Height:	<b>0.41</b>	<b>m</b>
Radius of Hole:	<b>0.038</b>	<b>m</b>	Test Length:	<b>5</b>	<b>m</b>
Packer Type:	<b>Mechanical Single</b>		Injection pipe Diameter:	<b>0.046</b>	<b>m</b>
Lugeon Value:	<b>6.500</b>	<b>lit/min/m/Mpa</b>	Injection pipe Length (15+25):	<b>40</b>	<b>m</b>
Permeability:	<b>9.750E-05 cm/sec</b>		Hole Inclination:	<b>Horizontal</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	2.80E-06	1.041	1040.997	0.500	0.100	0.961	1.243E-05
4	2.164E-03	4.039	4038.836	13.900	2.780	6.883	8.909E-05
7	6.133E-03	7.035	7034.867	23.400	4.680	6.653	8.611E-05
4	2.164E-03	4.039	4038.836	13.900	2.780	6.883	8.909E-05
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH



**Lugeon Value= 6.5**

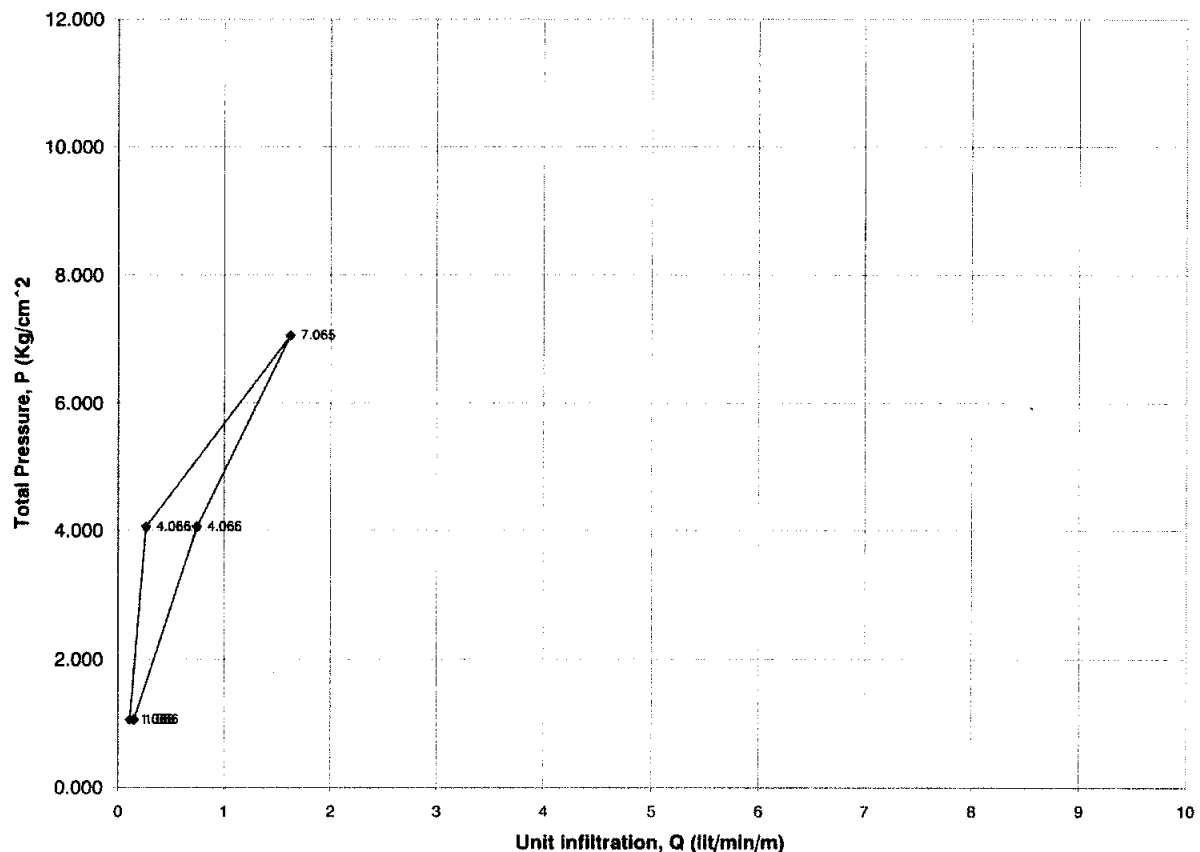
**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*Lu (cm/sec)**

**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.

Project:	<b>KULEKHANI-III HPP</b>	STRUCTURE:	<b>POWERHOUSE</b>
Drill Hole NO.:	<b>BPV-1</b>	Test Interval:	<b>30-35</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>2.980</b> lit/min/m/Mpa	Injection pipe Length (15+30):	<b>45</b> m
Permeability:	<b>4.470E-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=Po+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	3.81E-06	1.066	1065.996	0.550	0.110	1.032	1.336E-05
4	2.129E-05	4.066	4065.979	1.300	0.260	0.639	8.277E-06
7	8.267E-04	7.065	7065.173	8.100	1.620	2.293	2.968E-05
4	1.725E-04	4.066	4065.828	3.700	0.740	1.820	2.356E-05
1	7.088E-06	1.066	1065.993	0.750	0.150	1.407	1.821E-05

### LUGEON TEST P-Q GRAPH



Lugeon Value= 2.98

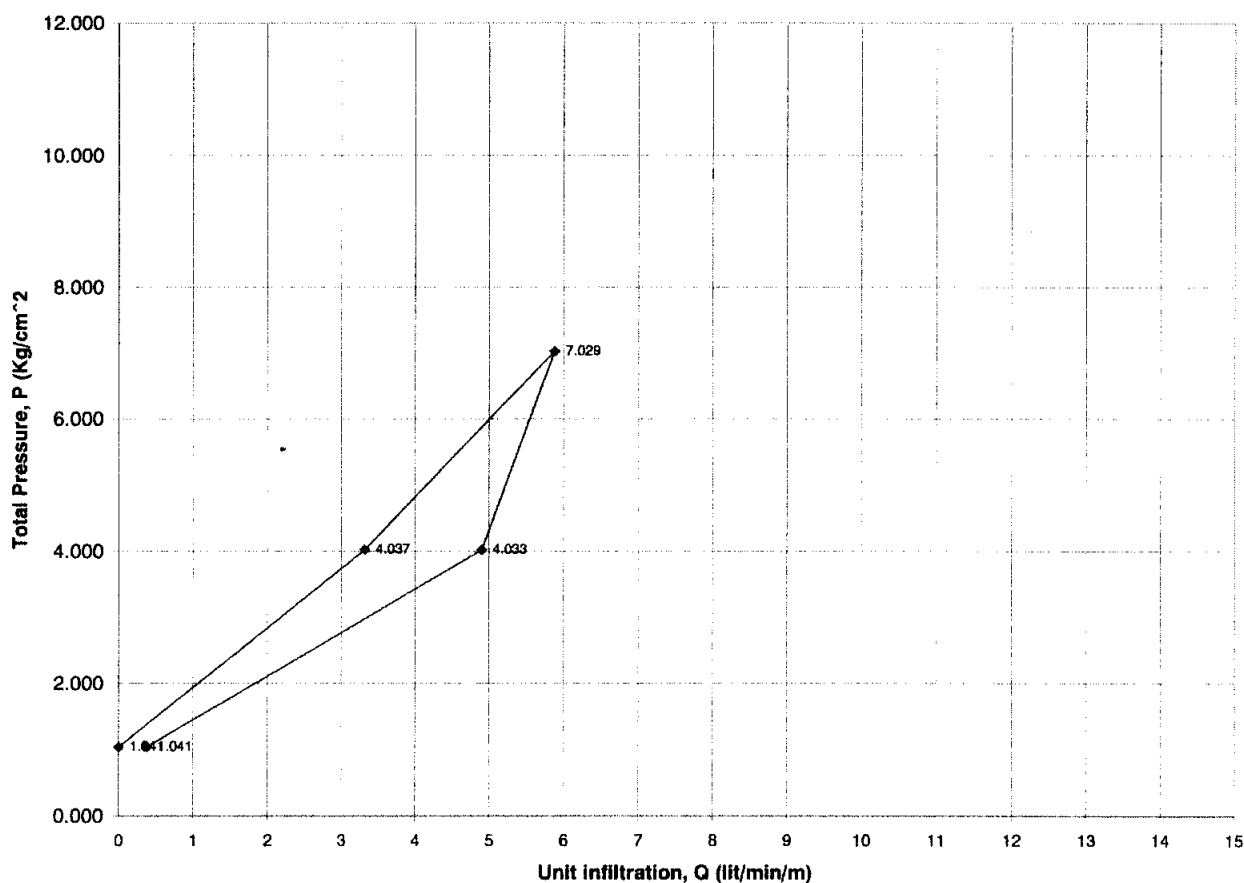
Coeff. Of Permeability, K=  $1.5 \times 10^{-5} \times Lu$  (cm/sec)

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.

Project: KULEKHANI-III HPP			STRUCTURE: POWERHOUSE	
Drill Hole NO.:	BPH-1		Test Interval:	35-40 m
Water Level:	0.0	m	Gauge Height:	0.41 m
Radius of Hole:	0.038	m	Test Length:	5 m
Packer Type:	Mechanical Single		Injection pipe Diameter:	0.046 m
Lugeon Value:	8.450	lit/min/m/Mpa	Injection pipe Length (15+35):	50 m
Permeability:	1.268E-04	cm/sec	Hole Inclination:	Horizontal

Pressure at Manometer po, (Kg/cm <sup>2</sup> )	Friction Headloss, H <sub>f</sub> (Kg/cm <sup>2</sup> )	Total Pressure, P=Po+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	5.05E-05	1.041	1040.949	1.900	0.380	3.651	4.725E-05
4	8.404E-03	4.033	4032.597	24.500	4.900	12.151	1.573E-04
7	1.210E-02	7.029	7028.899	29.400	5.880	8.365	1.083E-04
4	3.858E-03	4.037	4037.142	16.600	3.320	8.224	1.064E-04
1	0.000E+00	1.041	1041.000	0.000	0.000	0.000	0.000E+00

### LUGEON TEST P-Q GRAPH

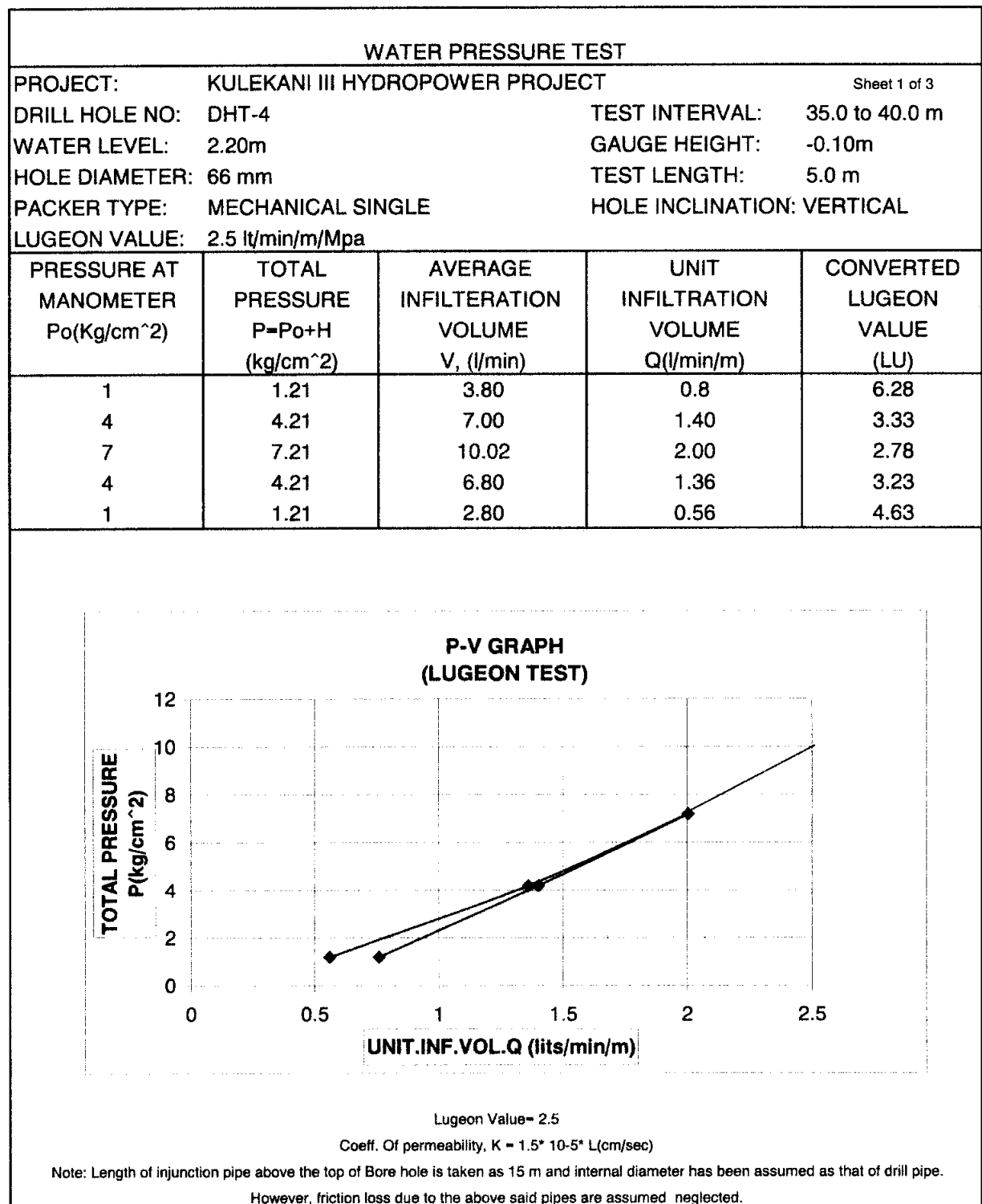


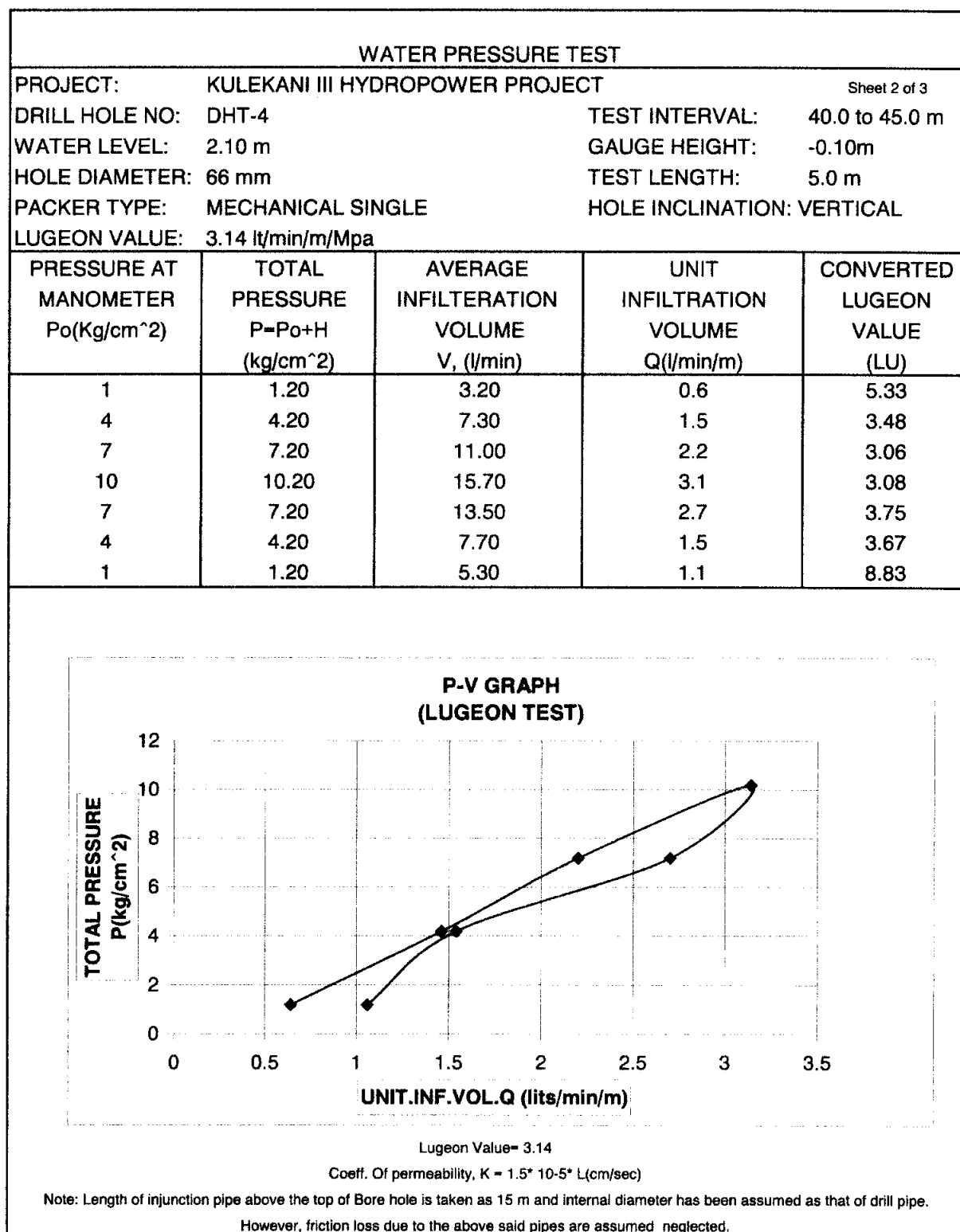
**Lugeon Value= 8.45**

**Coeff. Of permeability, K= 1.5\*10<sup>-5</sup> \*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.



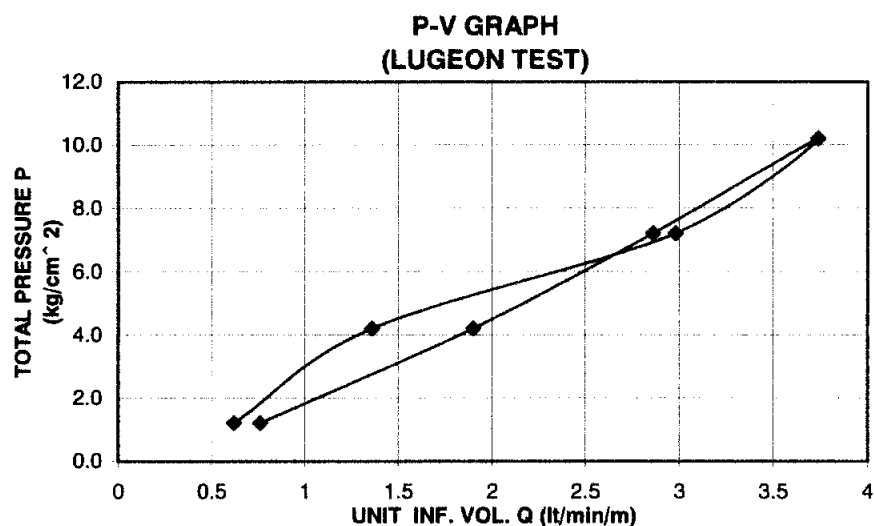




### WATER PRESSURE TEST

PROJECT:	KULEKANI III HYDROPOWER PROJECT	Sheet 3 of 3
DRILL HOLE NO:	DHT-4	TEST INTERVAL:
WATER LEVEL:	2.3m	GAUGE HEIGHT:
HOLE DIAMETER:	NX	TEST LENGTH:
PACKER TYPE:	MECHANICAL SINGLE	HOLE INCLINATION:
LUGEON VALUE:	3.74 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	1.22	3.10	0.6	5.08
4	4.22	6.80	1.4	3.22
7	7.22	14.90	3.0	4.13
10	10.22	18.70	3.7	3.66
7	7.22	14.30	2.9	3.96
4	4.22	9.50	1.9	4.50
1	1.22	3.80	0.8	6.23



Lugeon Value= 3.74

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.