Chapter 5

Pumping Test Data

Well	Commune / town	Coo	rdinates	Γ	Drilling	Reaming		Static			Step-draw				Aquifer loss		Average wel
No.		Latitude		Elevation	Depth	Depth	Length	Water	1st	2nd	3rd	4th	5th	6th	coefficient	coefficient	efficiency
		North	East					Level		Discharge(m3/h)					[B] (hr/m ²)	[C] (hr ² /m ⁵)	
		UTM	UTM	(m)	(m)	(m)	(m)	(m)			Drawdo			10.0	······		(%)
D1	Krong Nang	1432676	212271	714	140	100	40	11.80	1.8	7.2	12.6	18		10.8	5.13E-01	2.88E-02	64
									1.01	5.36	10.6	18.86	13.9	9.14	0.575.00	0.005.00	70
D2	Ea Drang	1461593	196617	644	180	120	48	24.00	0.5	0.9	1.3	1.6	1.1	0.7	8.57E+00	2.69E+00	78
				ļ					5.67	9.29	14.92	21.42	11.05	7.41		<u> </u>	
D3	Krong Buk	1412609	217070	484	140	70	30	9.00	4.3	8.6	13	17.3	10.8	7.2	1	3.10E-02	58
					····				3.06	6.92	13.03	19.05	13.5	8.45			
D4	Ea Drong	1427255	209295	615	180	116	58	15.89	3.2	6.1	9	11.9	7.9	5.4	1 1	3.82E-02	110
									10.05	16.89	23.97	32.87	22.03	15.76			
D5	Ea Wer	1418900	813607	255	150	35	22	2.00	3.6	7.2	10.8	13.3	10.1	6.5		9.64E-02	30
									2.25	7.83	14.67	21.09	12.33	7.5			
D6	Kien Duc	1325577	772292	691	170	120	40	32.20	-	-	-	-	-	-	-	-	
									-	-			18	-		5.70E-03	52
D7	Krong Kmar	1384752	210996	436	39	39	28	3.80	7.2	12.6	18	23				5.70E-03	52
					150			04.00	1.07 3.6	2.13 6.6	3.94 9.6	<u>5.37</u> 13.2	4.33 9.6	2.95 6.6		1.70E-03	101
G1	Kong Tang	1554896	202592	736	150	112	40	34.00				13.2 20.49		11.64	1.57 E+00	1.702-03	101
		1 1007 10	405700	404	170	110	34	01.00	5.65 1.9	10.27 3.6	14.9 5.2	20.49	16.2 5.4	3.9	1.97E+00	5.37E-01	47
G2	Nhon Hoa	1499742	185766	421	170	110	34	21.00	5.84	3.6 12.96	5.2 24.77	0.8 39	5.4 26.75	15.89		5.37 E-01	4/
		100071	704700	417	150	85	22	22.40	5.84	7.2	10.8	13.2	10.8	7.2		1.23E-01	52
G3	Chu Ty	1528374	791729	41/	150	60	. 22	22.40	4.2 5.79	11.78	24.11	32.06	26.2	14.96		1,20101	52
		4000070	813129	633	180	150	50	34.10	2.7	5.4	8.1	10.8	8.4	5.7	5.51E-01	9.60E-03	110
G4	Thang Hung	1630373	813129	033	100	150	50	54.10	1.45	2.62	3.78	4.93	4.4	3.25		0.002.00	
		1562211	814529	682	160	135	52	32.50	1.45	2.02	4.2		5.1	3.6	and the second sec	4.44E-02	93
G5	Nghia Hoa	1502211	014529	002	100	155	J2.	52.50	5.13	11.02	15	22	19.16	14.57	0.122100	1.112 02	
G6	la Sion	1474169	238141	140	180	158	38	24.15	3.6	8.4	13.2	17	13.2	8.4	8.28E-01	3.50E-03	91
Go	18 31011	14/4105	200141	140	100	100		24.10	3.07	6.97	11.73	15.08	13.25	8.96			
G7	Kong Yang	1531378	234391	472	160	110	34	10.80	4.5	9	13.8	18	14.4	10.2		4.00E-04	104
G/	Kong rang	1331370	204031		100		0.	10.00	4.8	9.7	14.67	19.19	14.63	9.29	1		
K1	Bo Y	1623379	782270	683	170	50	24	0.88	0.8	1.8	2.7	3.6	2.8	2.0	7.78E+00	9.35E-02	101
N1	501	1020070	102210						6.63	14.17	21.86	29.18	19.18	14.51			
K2A	Dak Su	1610205	783252	670	80	50	32	0.80	1.6	3.1	4.7	6.1	4.8	3.3	3.33E+00	9.60E-03	100
NZM	Dar Su	1010203	100202	0,0			JL	0.00	5.21	10.53	15.83	20.72	15.8	10.59			
КЗ	Dak Ui	1613032	177275	685	160	38	28	1.35	3	6.6	9.6	12.6	9	6		3.35E-02	84
ΝJ		1010032	111213					,	3.18	8.2	12.9	17.36	-	6.28			,
K6	Chu Hreng	1584716	177337	590	98	40	14	12.50	0.12	0.24		-	-	-	3.5E+01	1.7E+01	92
NU	Und Fileng	1304710	111007	0.00		40		12.50	4.42	9.34	_		_	-			

Well	Commune / town	Coo	rdinates		Drilling	Reaming	Screen	Static	Pumping	Drawdown	Specific	Theis method						
No.		Latitude	Longitude	Elevation	-	depth	length	water	discharge		capacity			n point		Transmissivity	Storage	Hydraulic
		North	East		1			level				u	W(u)	r2/t	S		coefficient	conductivity
	·····	UTM	UTM	(m)	(m)	(m)	(m)	(m)	(l/s)	<u>(m)</u>	(l/s/m)			(m2/s)	(m)	(m2/day)		(m/day)
D1	Krong Nang	1432676	212271	714	140	100	40	11.80	4.00	15.89	0.25	1.0E-10	22.0	1.0E-04	13.0	4.7E+01	1.3E-07	1.2E+00
D2	Ea Drang	1461593	196617	644	180	120	48	24.00	0.45	20.56	0.02	1.0E-06	13.0	1.0E-04	17.5	2.3E+00	6.4E-05	4.8E-02
D3	Krong Buk	1412609	217070	484	140	70	30	9.00	4.80	21.26	0.23	1.0E-07	15.0	1.0E-05	16.0	2.6E+01	7.2E-04	8.6E-01
	Ea Drong	1427255	209295	615	180	116	58	15.89	3.10	30.20	0.10	1.0E-10	21.0	1.0E-04	23.5	1.9E+01	5.3E-08	3.3E-01
	Ea Wer	1418900	813607	255	150	35	22	2.00	3.70	21.42	0.17	1.0E-10	21.0	1.0E-04	17.0	3.1E+01	8.7E-08	1.4E+00
	Kien Duc	1325577	772292		170			32.20	0.25	22.23	0.01	-	-	-	-	-	-	-
	Krong Kmar	1384752	210996		39			3.80	6.40	6.50	0.98	1.0E-06	11.5	1.0E-04	4.0	1.3E+02	3.5E-03	4.5E+00
	Kong Tang	1554896	202592		150			34.00	3.73	21.73	0.17		22.0	1.0E-04	19.0	3.0E+01	8.2E-08	7.4E-01
	Nhon Hoa	1499742	185766		170			21.00	2.00	40.34	0.05		20.0	1.0E-04	37.0	7.4E+00	2.1E-08	
								22.40	3.67	32.22	0.11		12.0	4.0E-03	13.5	2.2E+01	6.2E-04	1.0E+00
G3	Chu Ty	1528374	791729		150													
G4	Thang Hung	1630373	813129	633	180	150	50	34.10	3.00	9.66	0.31	1.0E-05	11.0	1.0E-03	3.5	6.5E+01	1.8E-03	1.3E+00
G5	Nghia Hoa	1562211	814529	682	160	135	52	32.50	2.00	26.13	0.08	1.0E-06	13.0	1.0E-04	20.0	8.9E+00	2.5E-04	1.7E-01
G6	la Sion	1474169	238141	140	180	158	38	24.15	4.70	15.83	0.30	1.0E-10	22.0	1.0E-04	12.6	5.6E+01	1.6E-07	1.5E+00
G7	Kong Yang	1531378	234391	472	160	110	34	10.80	5.00	22.96	0.22	1.0E-07	15.0	1.0E-05	20.0	2.6E+01	7.2E-04	7.6E-01
	Во Ү	1623379	782270	683	170	50	24	0.88	1.00	31.73	0.03	1.0E-02	4.2	1.0E-04	19.0	1.5E+00	4.2E-01	6.3E-02
	Dak Su	1610205	783252	670	80	50	32	0.80	1.73	21.34	0.08	1.0E-05	12.0	4.0E-05	18.0	7.9E+00	5.5E-03	2.5E-01
	Dak Ui	1613032	177275	685	160	38	28	1.35	3.00	16.90	0.18	1.0E-06	13.0	1.0E-04	13.0	2.1E+01	5.7E-04	7.4E-01
	Chu Hreng	1584716			98	40	14	12.50	0.07	22.50	0.003	-	-	-	-		-	

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Table D5. 2 Result of the Constant Continuous Test and Recovery Test Analyzed by Theis Analysis Method

Well	Commune / town	Coc	ordinates		Drilling	Reaming	Screen	Static	Pumping	Drawdown	Specific	Cooper-Jacob an	alysis method		Recovery a	nalysis
No.		Latitude	Longitude	Elevation	depth	depth	length	water	discharge		capacity	Transmissivity	Storage	Hydraulic	Transmissivity	Hydraulic
		North	East					level					coefficient	conductivity		conductivity
		UTM	UTM	(m)	(m)	(m)	(m)	(m)	(l/s)	(m)	(l/s/m)	(m2/day)		(m/day)	(m2/day)	(m/day)
D1	Krong Nang	1432676	212271	714	140	100	40	11.80	4.00	15.89	0.25	4.2E+01	2.0E-06	1.1E+00	3.2E+01	7.9E-01
D2	Ea Drang	1461593	196617	644	180	120	48	24.00	0.45	20.56	0.02	2.4E+00	3.3E-04	4.9E-02	4.0E+00	8.2E-02
D3	Krong Buk	1412609	217070	484	140	70	30	9.00	4.80	21.26	0.23	1.4E+01	6.4E-01	4.6E-01	1.3E+01	4.2E-01
D4	Ea Drong	1427255	209295	615	180	116	58	15.89	3.10	30.20	0.10	1.6E+01	7.6E-06	2.8E-01	1.6E+01	2.8E-01
D5	Ea Wer	1418900	813607	255	150	35	22	2.00	3.70	21.42	0.17	2.3E+01	1.1E-05	1.1E+00	2.3E+01	1.1E+00
	Kien Duc	1325577	772292	691	170	120	40	32.20	0.25	22.23	0.01	2.9E-01	4.1E-01	7.3E-03	2.8E-01	7.0E-03
	Krong Kmar	1384752	210996	436	39	39	28	3.80	6.40	6.50	0.98	6.7E+01	3.1E-01	2.4E+00	8.4E+01	3.0E+00
	Kong Tang	1554896	202592	736	150	112	40	34.00	3.73	21.73	0.17	3.0E+01	1.4E-07	7.4E-01	2.1E+01	5.3E-01
	Nhon Hoa	1499742		421	170	110	34	21.00	2.00	40.34	0.05	3.5E+00	3.3E-03	1.0E-01	6.3E+00	1.9E-01
	Chu Ty	1528374	791729	417	150	85	22	22.40	3.67	32.22	0.11	1.7E+01	7.7E-03	7.5E-01	7.0E+00	3.2E-01
	Thang Hung	1630373		633	180	150	50	34.10	3.00	9.66	0.31	4.8E+01	2.2E-02	9.6E-01	6.8E+01	1.4E+00
	Nghia Hoa	1562211		682		135	52	32.50	2.00	26.13	0.08	9.0E+00	4.2E-04	1.7E-01	1.1E+01	2.0E-01
	la Sion	1474169		140	180	158	38	24.15	4.70	15.83	0.30	3.7E+01	1.7E-04	9.8E-01	6.2E+01	1.6E+00
	Kong Yang	1531378		472	160	110	34	10.80	5.00	22.96	0.22	2.8E+01	1.3E-03	8.3E-01	5.3E+01	1.6E+00
	Bo Y	1623379					24	0.88	1.00	31.73	0.03	1.9E+00	2.7E-01	8.0E-02	1.7E+00	7.2E-02
	Dak Su	1610205		670	80	50	32	0.80	1.73	21.34	0.08	3.9E+00	3.6E-02	1.2E-01	9.1E+00	2.9E-01
	Dak Ui	1613032			160	38	28	1.35	3.00	16.90	0.18	1.7E+01	2.4E-03	6.1E-01	1.6E+01	5.6E-01
	Chu Hreng	1584716	177337	590	98	40	14	12.50	0.07	22.50	0.00	6.0E-02	2.9E-01	4.3E-03	1.3E-01	9.3E-03

Table D5. 3Result of the Constant Continuous Test and Recovery Test Analyzed by
Coop er-Jacob and Recovery Analysis Methods

K6 : pumping for 5 hours

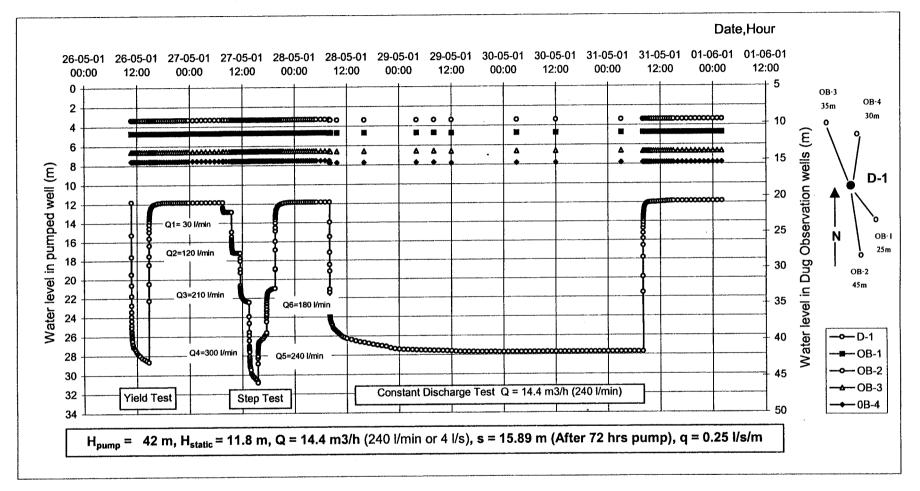


Figure D5. 1 Pumping Test of Borehole D-1 - Krong Nang Town - Krong Nang

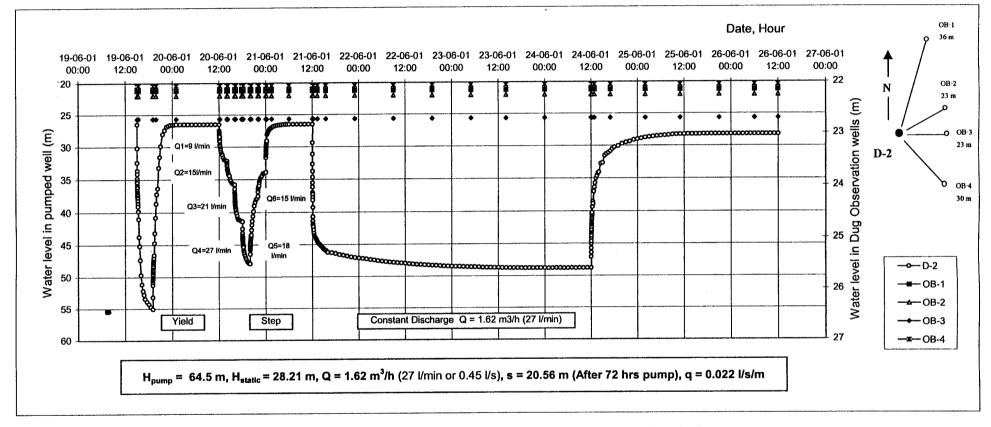


Figure D5. 2 Pumping Test of Borehole D-2 - Ea Drang Town - Ea Hleo District

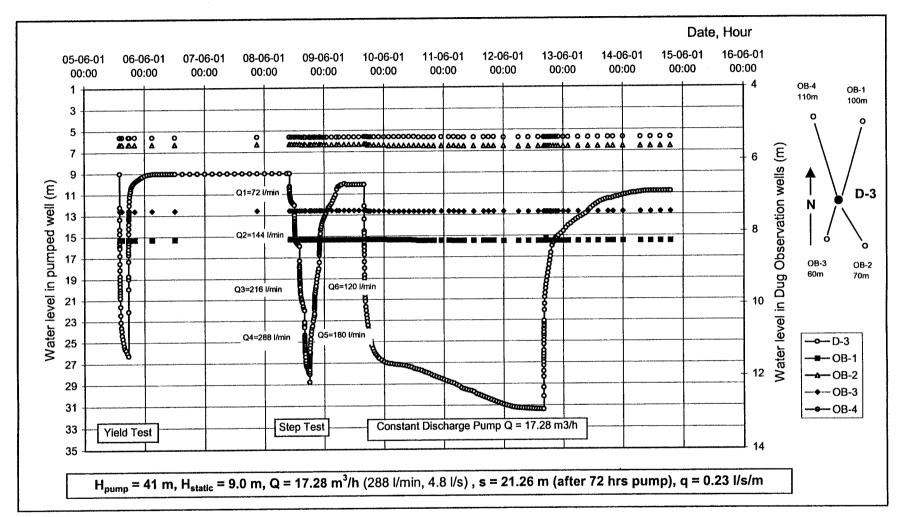


Figure D5. 3 Pumping Test of Borehole D-3 - Krong Buk Commune - Krong Pak

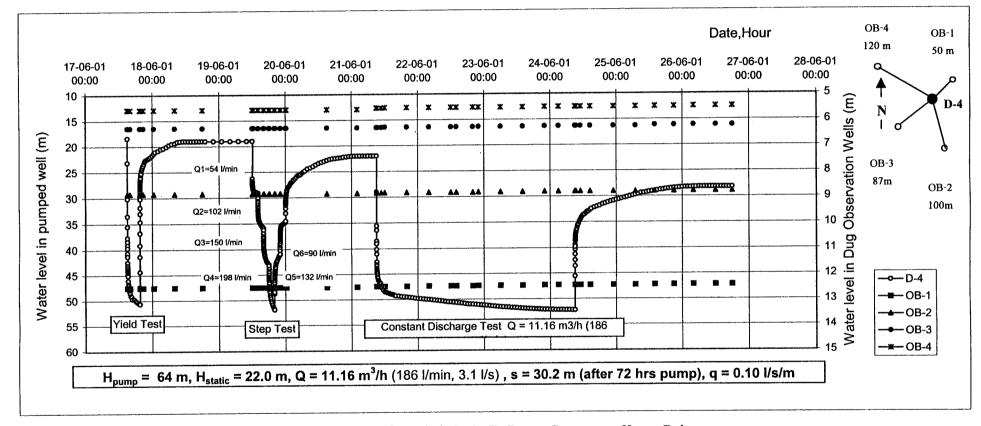


Figure D5. 4 Pumping Test of Borehole D-4 - Ea Drong Commune - Krong Buk

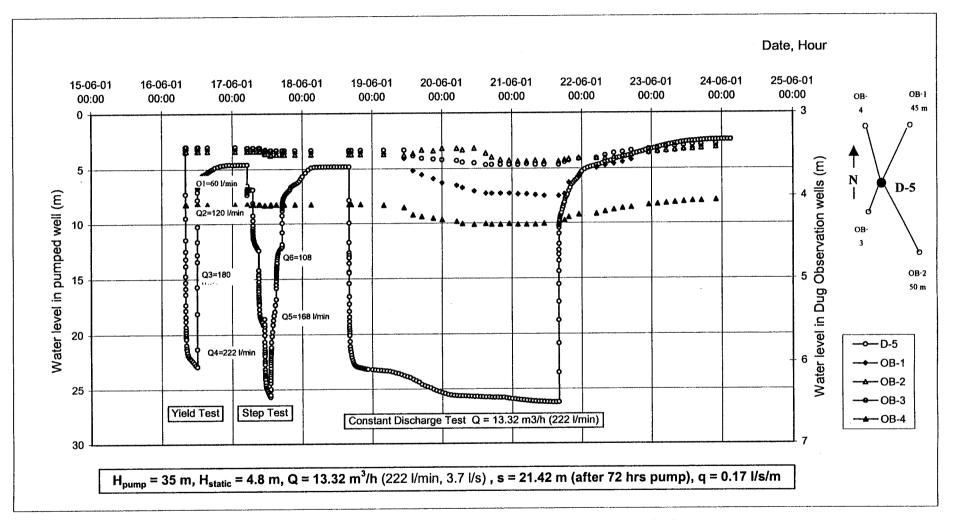


Figure D5. 5 Pumping Test of Borehole D-5 - Ea Wer Commune - Buon Don District

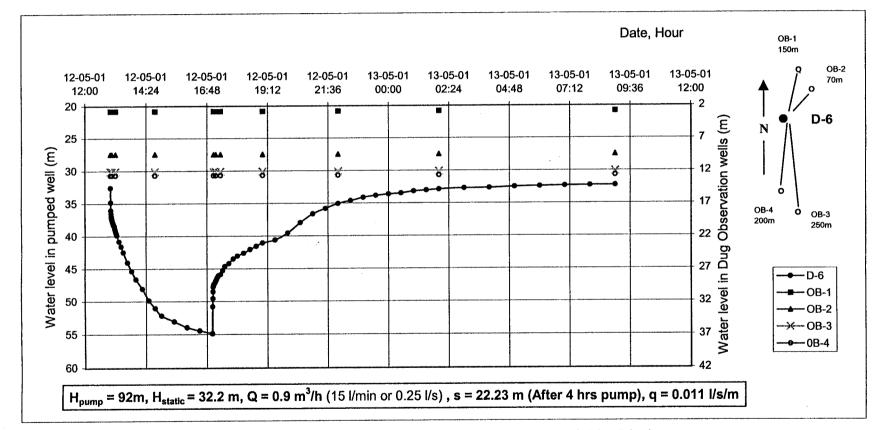


Figure D5. 6 Pumping Test of Borehole D-6 - Kien Duc Town - Dak Rlap District

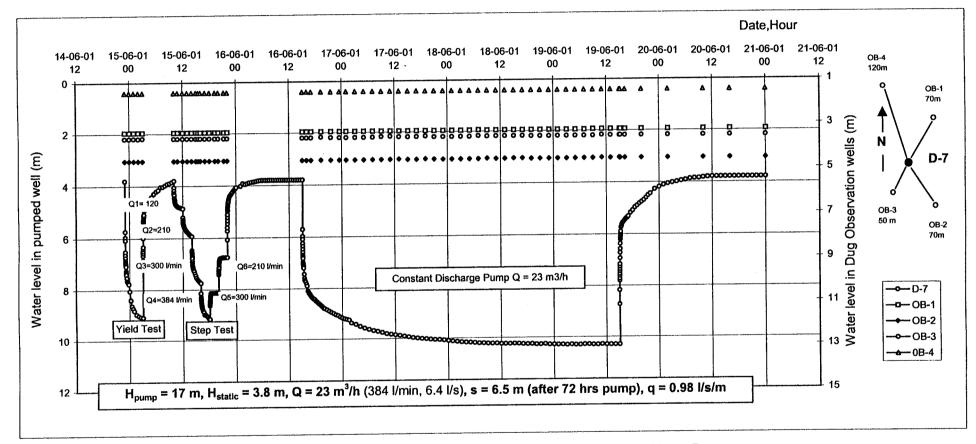
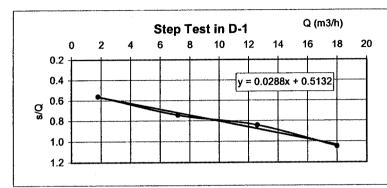
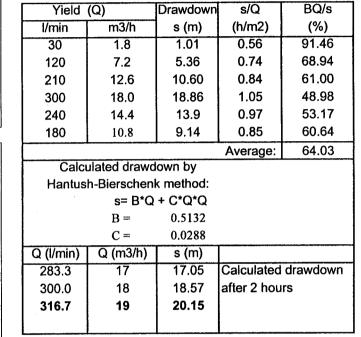


Figure D5. 7 Pumping Test of Borehole D-7 - Krong Kmar Town - Krong Bong





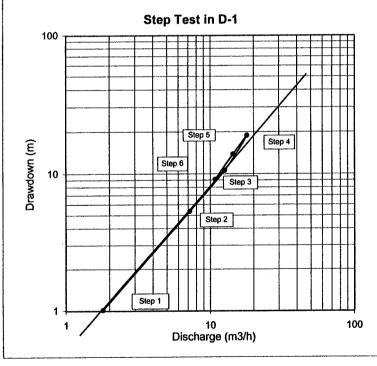
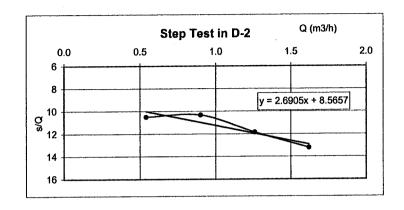
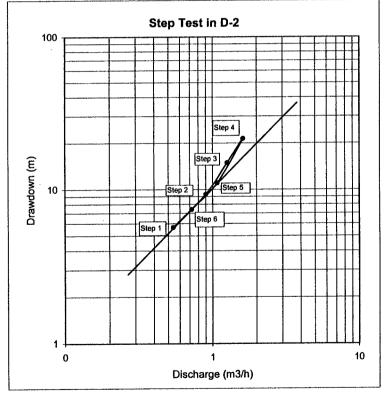


Figure D5. 8 Step Drawdown Test at Borehole D-1

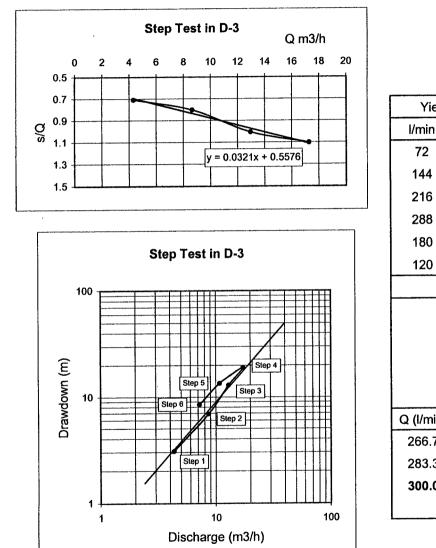
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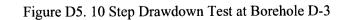


Yield (\overline{O}	Drawdown	s/Q	BQ/s					
l/min	 	s (m)	(h/m2)	(%)					
9	0.5	5.67	10.50	81.58					
15	0.9	9.29	10.32	82.98					
21	1.3	14.92	11.84	72.34					
27	1.6	21.42	13.22	64.78					
18	1.1	11.05	10.23	83.72					
12	0.7	7.41	10.29	83.23					
	horana <u>1999 - 1</u> 999 - 1999 -		Average:	78.11					
Calculated drawdown by									
	Hantush-Bierschenk method:								
	s= B*Q	+ C*Q*Q							
	B =	8.5657							
	C =	2.6905							
Q (I/min)	Q (m3/h)	s (m)							
25.0	1.5	18.90	Calculated drawdown						
26.7	1.6	20.59	after 2 hours						
28.3	1.7	22.34							

Figure D5. 9 Step Drawdown Test at Borehole D-2



r									
Yield	(Q)	Drawdown	s/Q	BQ/s					
l/min	m3/h	s (m)	(h/m2)	(%)					
72	4.3	3.06	0.71	78.72					
144	8.6	6.92	0.80	69.62					
216	13.0	13.03	1.01	55.46					
288	17.3	19.05	1.10	50.58					
180	10.8	13.5	1.25	44.61					
120	7.2	8.45	1.17	47.51					
			Average:	57.75					
	Calculated drawdown by								
	Hantush-E	Bierschenk me	ethod:						
	s= B*	'Q + C*Q*Q							
	B =	0.5576							
	C =	0.0321							
Q (I/min)	Q (m3/h)	s (m)							
266.7	16	17.14	17.14 Calculated						
283.3	17	18.76	after 2 hours						
300.0	18	20.44							



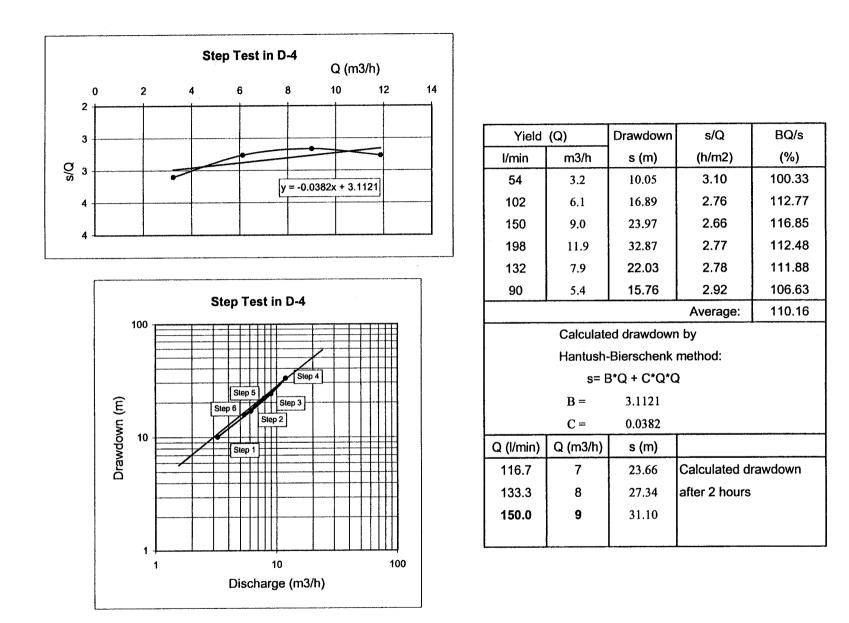


Figure D5. 11 Step Drawdown Test at Borehole D-4

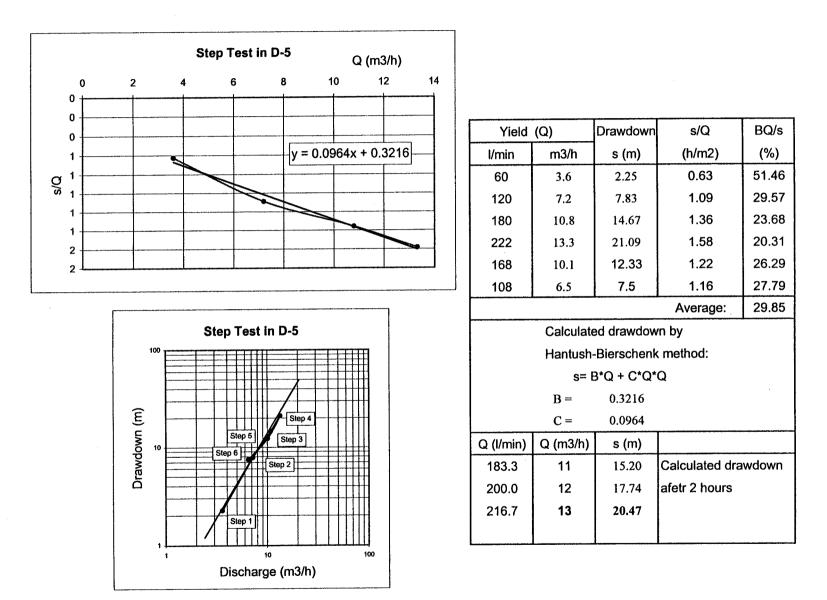


Figure D5. 12 Step Drawdown Test at Borehole D-5

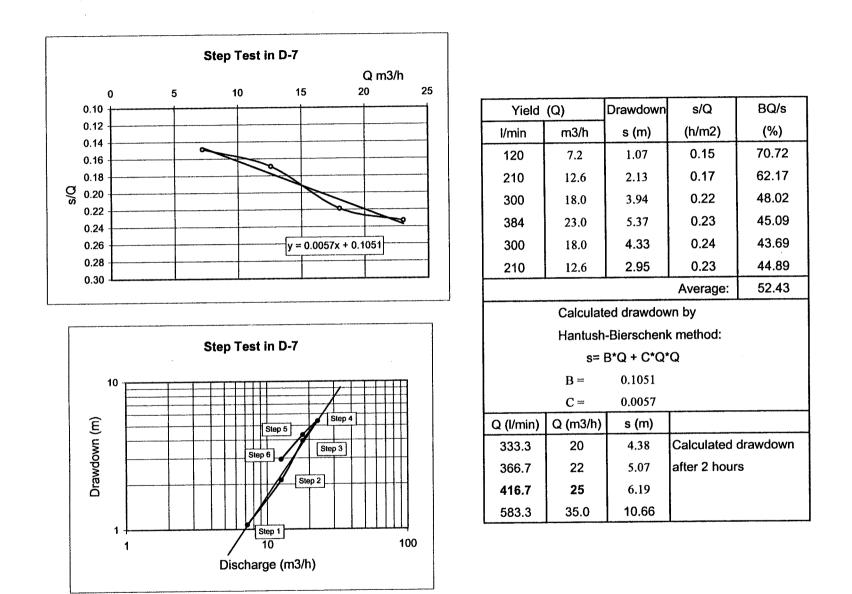


Figure D5. 13 Step Drawdown Test at Borehole D-7

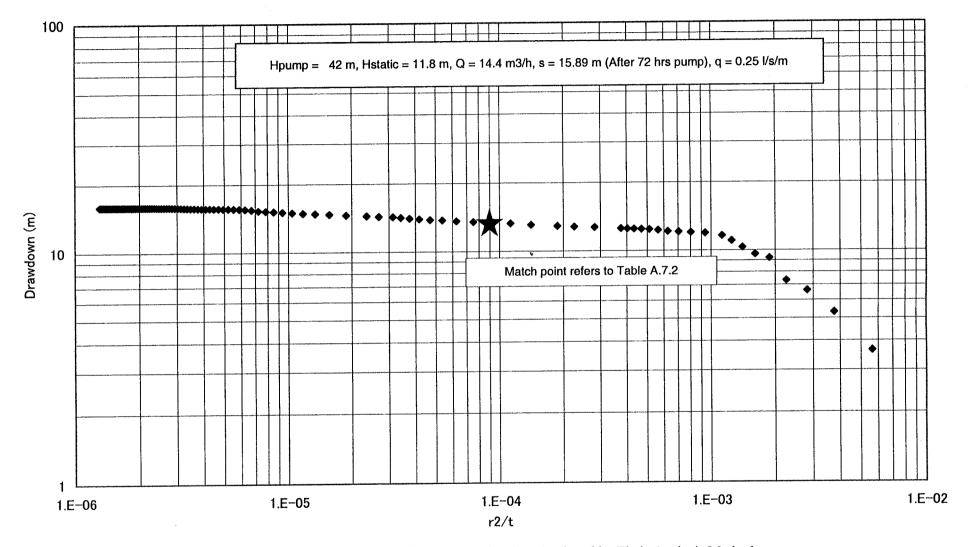


Figure D5. 14 Constant Continuous Pumping Test Analyzed by Theis Analysis Method at D1, Krong Nang Town

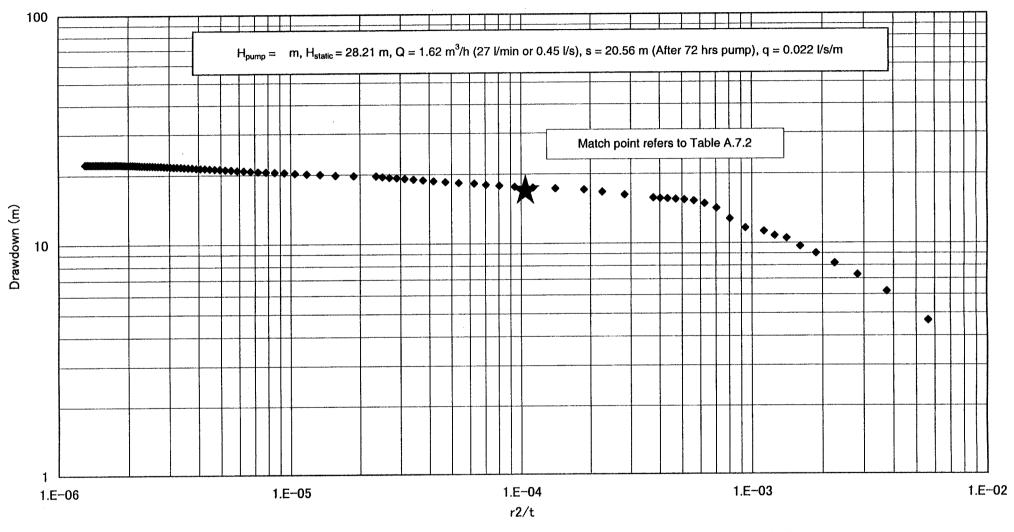
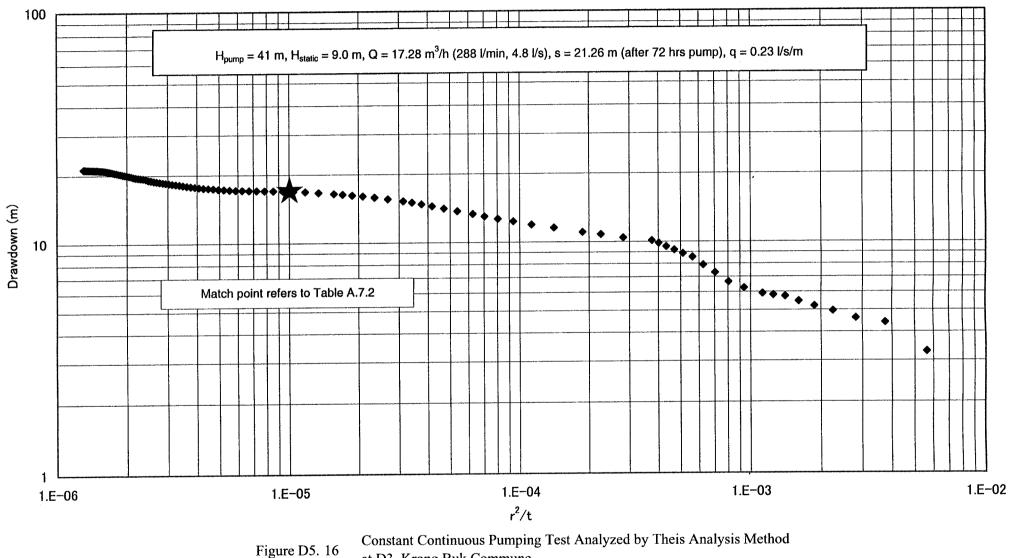


Figure D5. 15 Constant Continuous Pumping Test Analyzed by Theis Analysis Method at D2, Ea Drang Town



at D3, Krong Buk Commune

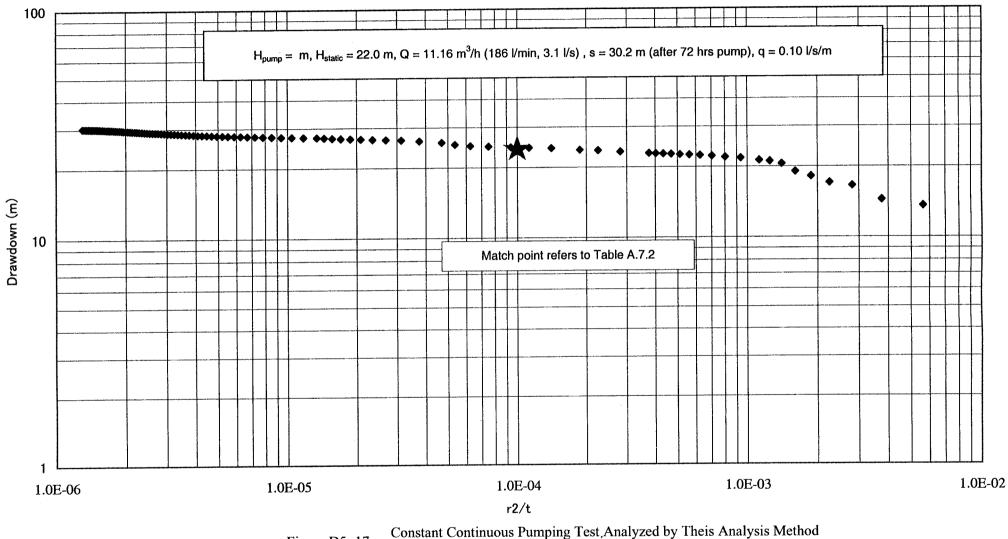
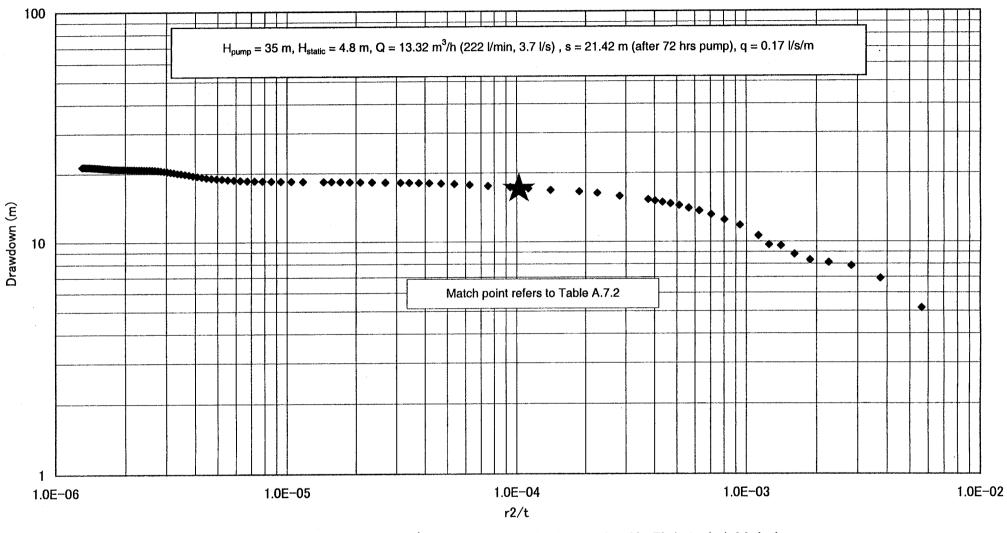
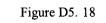


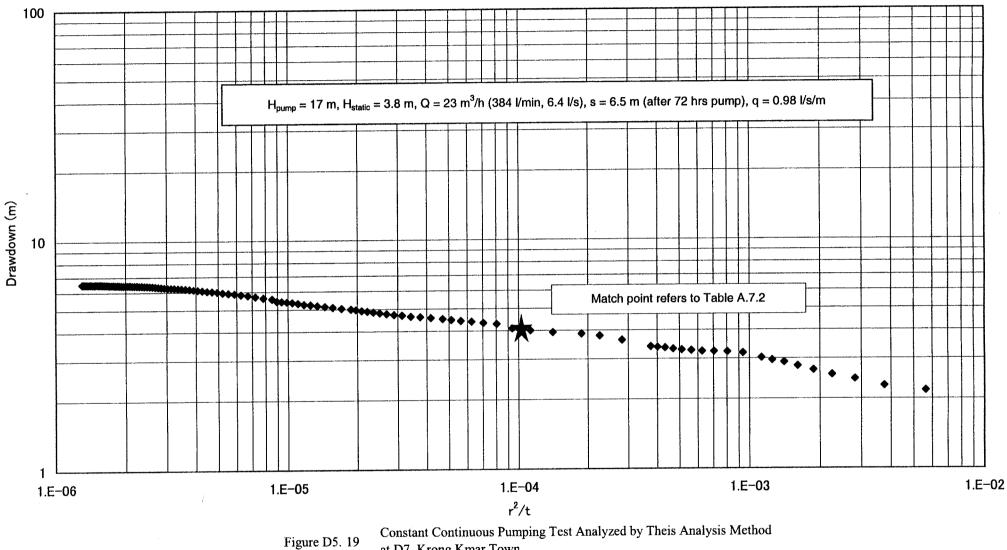
Figure D5. 17

at D4, Ea Drong Commune





Constant Continuous Pumping Test Analyzed by Theis Analysis Method at D5, Ea Wer Commune



at D7, Krong Kmar Town

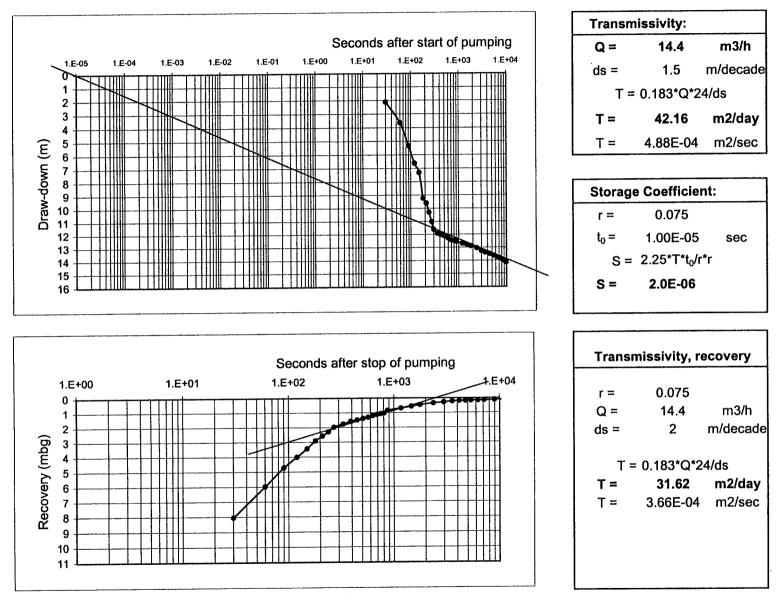
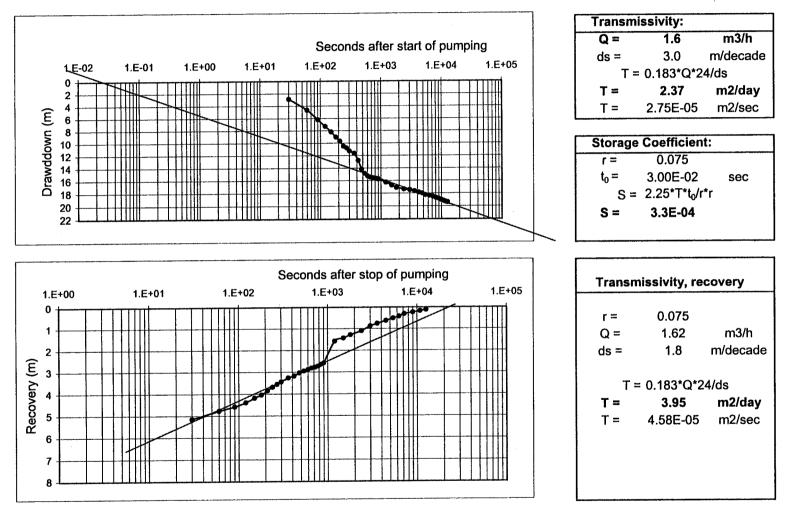


Figure D5. 20 Calculation of Transmissivity and Storage Coefficient by Cooper-Jacob and Recovery methods at Borehole D-1





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Calculation of Transmissivity and Storage Coefficient by Cooper-Jacob and Recovery methods at Borehole D-2

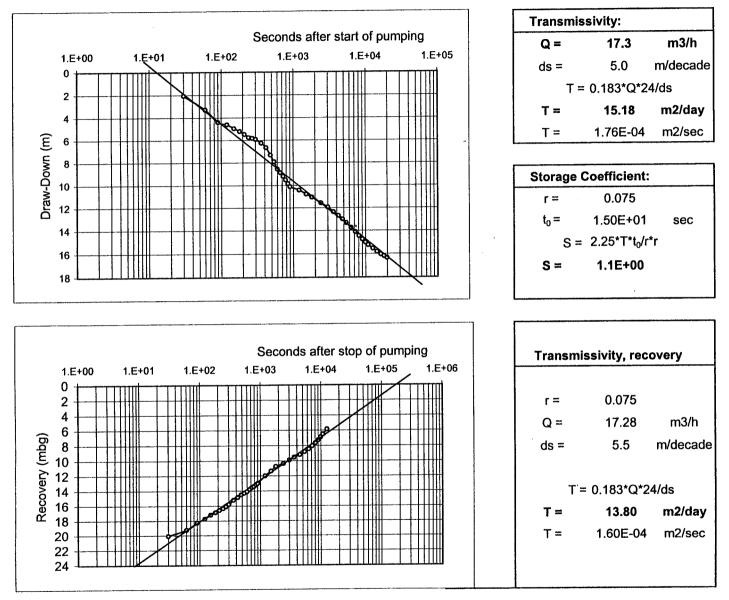
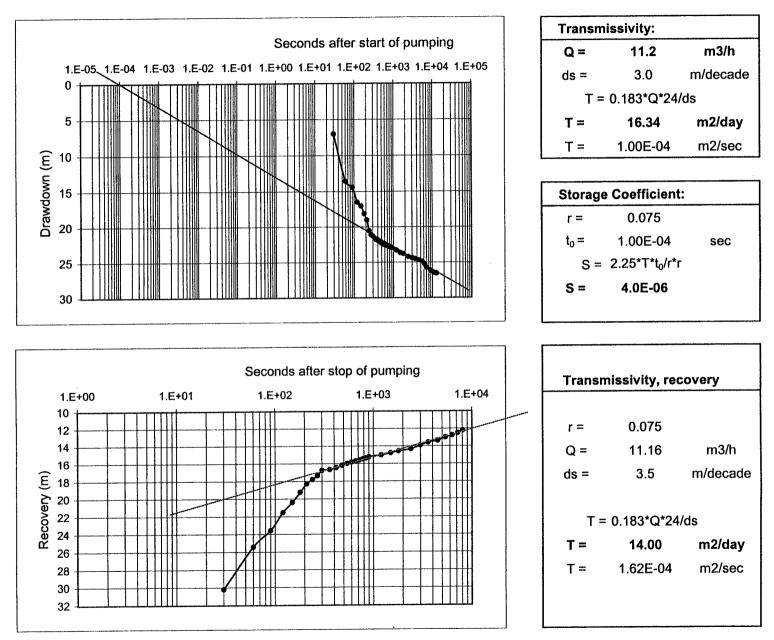
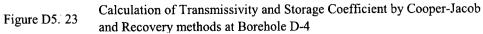


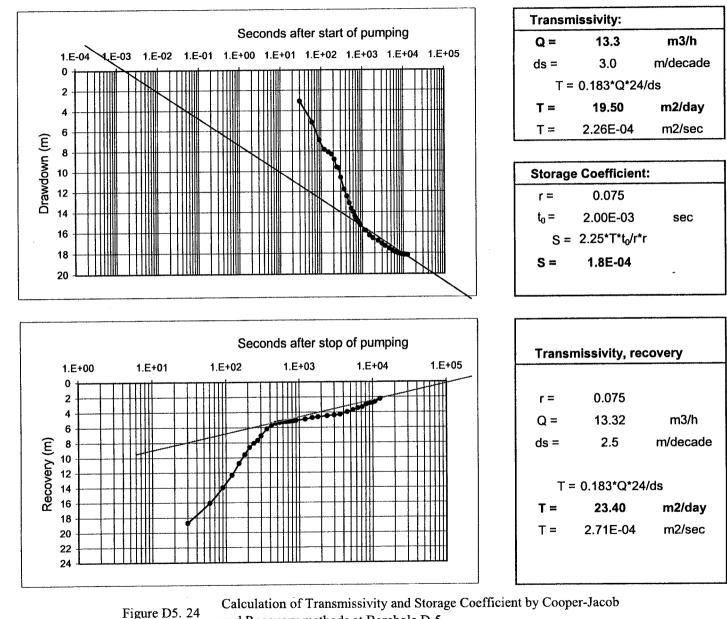
Figure D5. 22 Calculation of Transmissivity and Storage Coefficient by Cooper-Jacob and Recovery methods at Borehole D-3

D5- 25

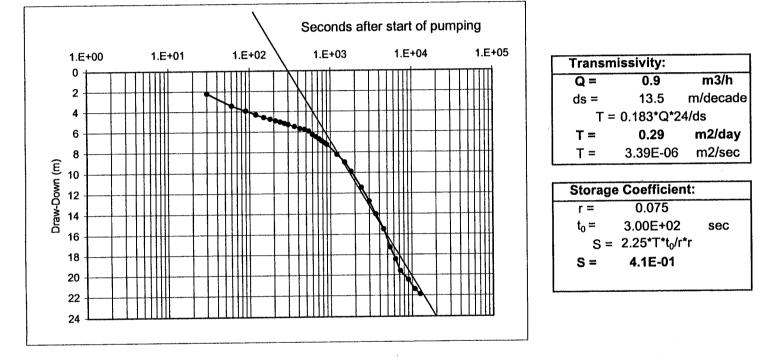
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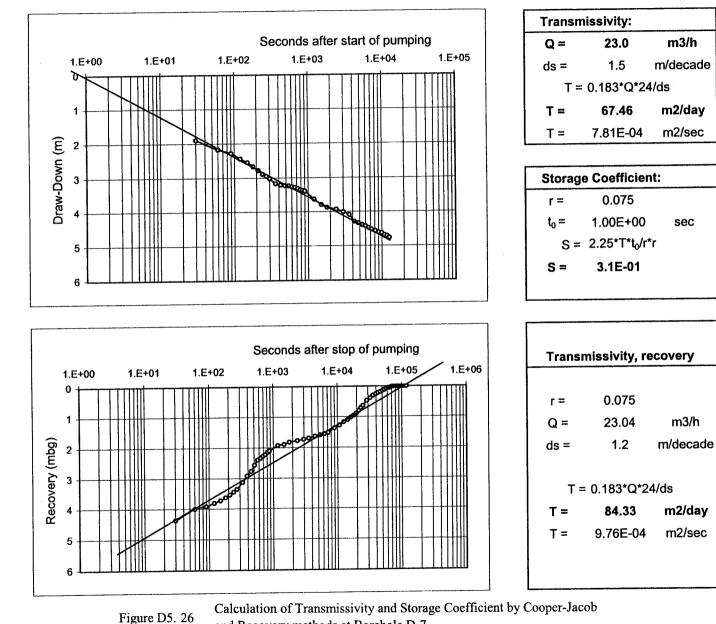


and Recovery methods at Borehole D-5





Calculation of Transmissivity and Storage Coefficient by Cooper-Jacob and Recovery methods at Borehole D-6



and Recovery methods at Borehole D-7