#### THE REPUBLIC OF TURKEY

# FEASIBILITY STUDY ON OLTU RIVER HYDROELECTRIC POWER DEVELOPMENT PROJECT

# FINAL REPORT

OCTOBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

V E N C (R (S) Ga-06040

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# FINAL REPORT APPENDIX



2435/

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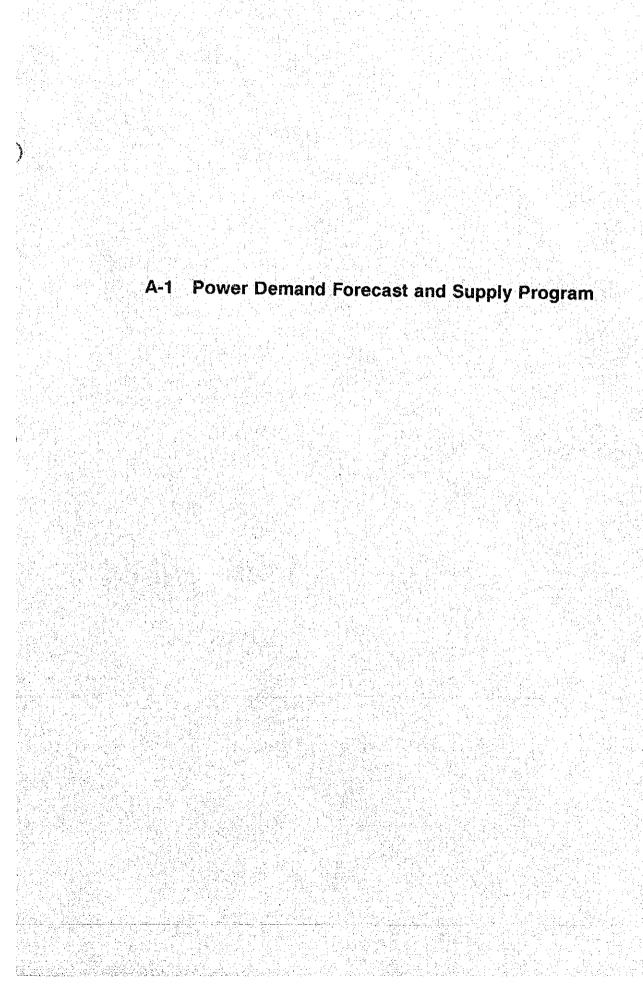
国際協力事業団

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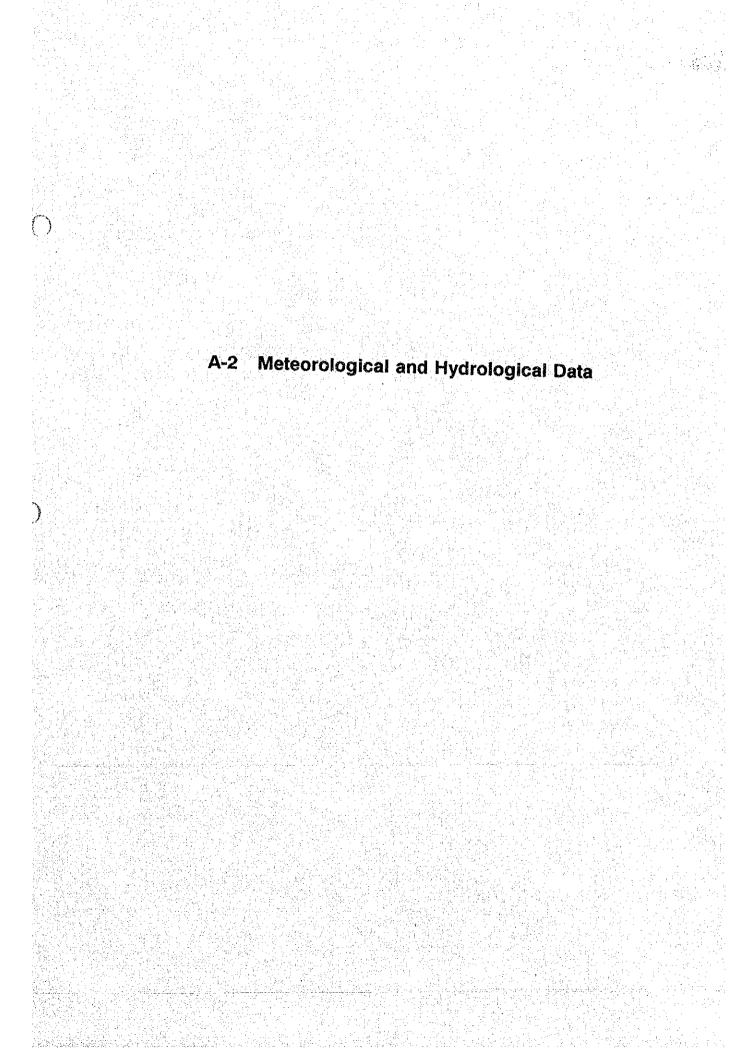


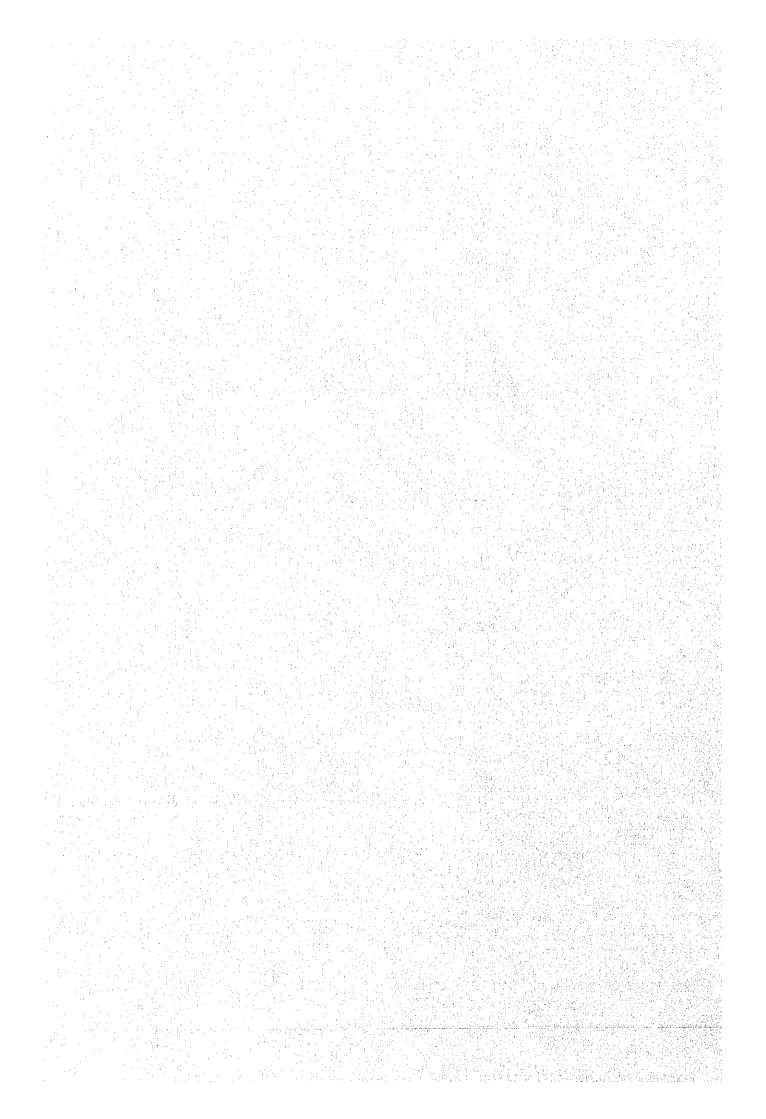
# Development Plan of Electric Power of Turkey

Year	Hydroele	ectric Power Station		Therma	Power Station		Tot	al
1001	Project	MW	GWh	Project	MW	G₩h	MW	GWh
1995		10, 896	38, 624		11, 013	71, 466	21, 914	110, 090
1996	Total	0	0	Tunobilek A (L) Kangal 3 (L) Dogal (G) Total	▲ 129 0 450	▲ 900 1,000 3,150 3,250	(22, 235) 321	3, 250
1997				Elbistan A56 (L) Dogał (G)	2×340 2×450	2×2, 380 2×3, 150		
	Total	0	0	Total	1, 580	11, 060	(23, 815) 1, 580	11,060
1998	Kayraktepe Berke	431 510	991 1, 663	Elbistan B1,2 (L) Dogal (G)	2×340 450	2×2, 380 3, 150		
· .	Total	941	2, 659	Total	1, 130	7, 910	(25, 886) 2, 071	11, 569
1999	Birecik Boyabat Yedigöze Alpaslan	672 513 300 160	2, 516 1, 468 969 567	Elbistan B3,4 (L)	2×340	2×2, 380		
	Alpaslan Cindere Total	40 27 1,712	238 88 5, 846	Total	680	4, 760	(28, 278) 2, 392	10, 606
2000	Akköpru Karkamcs	115 180	343 652	Cayirham 3,4 (L) Dogal (G)	2×150 3×450	2×1, 050 3×3, 150		
·	Total	295	995	Total	1. 650	11. 550	(30, 223) 1, 945	12, 545
2001	Ilisu	1, 200	3, 833	Dogal (G) Ithal Kömer (T)	2×450 2×500	2×3, 150 2×3, 500		
	Total	1, 200	3, 833	Total	1, 900	13. 300	(33, 323)	17. 133

Year	Hydroele	ectric Power Station			Thermal Power Station	:	Total	a
·	Project	MW	GWh	Project	WA	GWh	MW	GWh
2002	OF Solarli Cizre Torul Uzunçayir	380 240 103 72	1, 000 1, 218 322 317	Elbistan C1,2 (1 Adyaman (1 Dogal (1	.) 150	1, 050		
	Total	795	2, 857	Total	1. 730	12, 110	(35, 848) 2, 525	14. 96
2003	Deriner Total	670	2, 118	Elbistan C3,4 (L Cayrham B1 (L Dogal (G	340	2×2, 380 2, 380 2×3, 150	(38, 438)	
	10141	670	2, 118	Total	4. 920	13, 440	2, 590	15, 55
2004	Borcka Muratle Yusfeli	300 115 540	1, 039 445 1, 705	Cayrham D2 (L Anasra 1 (T Dogal (G Ithal Kömer (T	300 2×450	2. 380 2. 100 2×3. 150 3. 500		
	Total	955	3, 189	Total	2, 040	14, 280	(41, 433) 2, 995	17. 46
2005	Beskonak Artvin	201 332	660 989	Soma C1 (L) Amasra (T) Dogal (G) Ithal Kömer (T)	300 2×450	1, 155 2, 100 2×3, 150 2×3, 500		
	Total	533	1, 649	Total	2. 365	16, 555	(44, 131) 2, 698	18, 204
2006	Dilek-Gorolik Göktas	135 270	511 1, 160	Dogal (G) Ithal Kömer (T)		2×3, 150 4×4, 500	(47, 436)	
	Total	405	1, 671	Total	2, 900	20, 300	3, 305	21, 971
2007	Sanliurfa Aslancik Konaktepe Ulubat-Çinarcik Camlica 1	50 90 210 120 131	349	Soma C2 (L) Dogal (G) Ithal Komer (T)	165 450 4×500	1, 155 3, 150 4×3, 500		
	Total	601	2, 230	Total	2. 615	18, 305	(50, 652)	20, 535
	Total	601	2. 230	Total	2, 615	18, 305	3, 216	20.

Year	Hydroele	ectric Power Station		Therma	i Power Station		Total	Meritada ayay kalka saya daka serinda yaki kalanci ya kalenda ya kalenda ya kalenda ya kalenda ya kalenda ya k
····	Project	MW	GWh	Project	MW	G₩h	MW	GWh
2008	Ermenek Hakkari	320 322	742 1, 043	Seyitomer B1,2 (L) Bolu (L) Dogal (G) Ithal Kömer (T)	2×150 150 3×450 3×500	2×1, 050 1, 050 3×3, 150 3×3, 500		
. •	Total	642	1, 785	Total	3, 300	23, 100	(54, 594) 3, 942	24, 885
2009	Alkumru Çetin Penbelik Dalaman-Bezkese Total	176 244 100 50	807 1, 100 313 205	Beysehir (L) Dogal (G) Ithal Kömer (T) Nuclear (N)	340 2×450 2×500 1,066	2, 380 2×3, 150 2×3, 500 7, 460	(58, 470)	
	Özköy	156	2, 425	Total  Bolu Göynük 2 (L)	3, 306	23, 140	3, 876	25, 565
2010	Gursögot other 21	242 762	276 3, 370	Dogal Ithal Komer Nuclear	2×450 3×500 1.066	2×3, 150 3×3, 500 7, 460		
	Total	1, 200	3, 828	Total	3, 616	25, 310	(63, 286) 4, 816	29, 138





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		Flood Peak Discharges

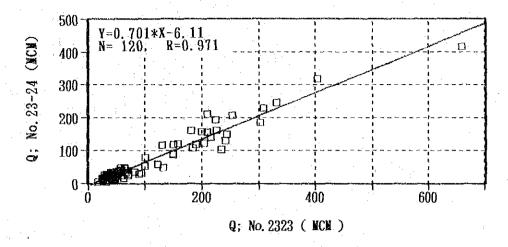


Fig. A-2-1(a) Correlation Analysis between Nos.23-24 and 2323 Gauging Station

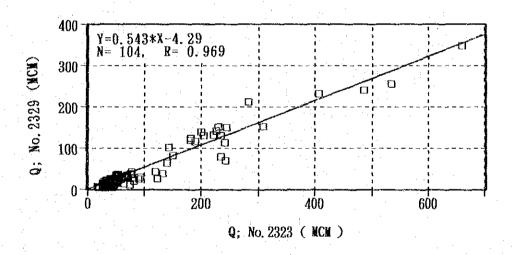


Fig. A-2-1(b) Correlation Analysis between Nos.2329 and 2323 Gauging Station

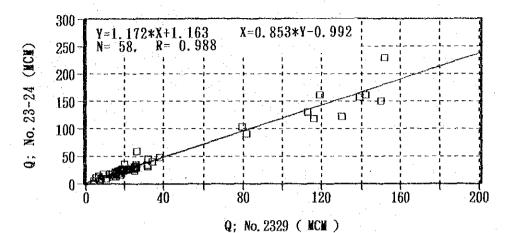


Fig. A-2-2(a) Correlation Analysis between Nos.23-24 and 2329 Gauging Station

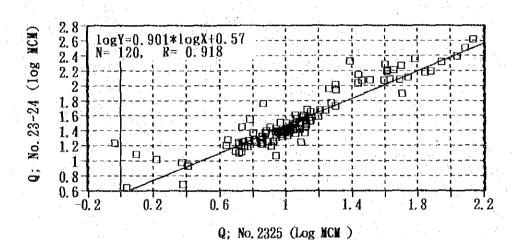


Fig. A-2-2(b) Correlation Analysis between Nos.23-24 and 2325 Gauging Station

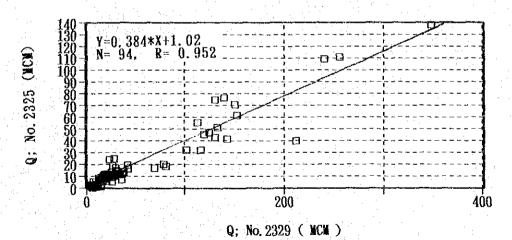


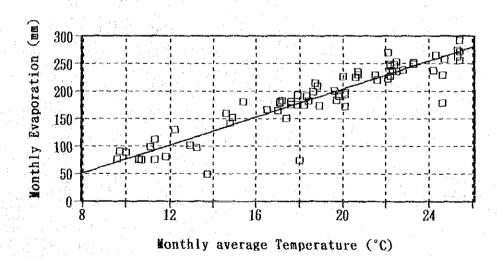
Fig. A-2-2(c) Correlation Analysis between Nos.2325 and 2329 Gauging Station

Table A-2-6 Estimated Monthly Temperatures at Tortum Power Station

Yе	ar	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug	Sep	0ct	Nov	( unit Dec	; 'C) Ave.
			<u></u>								·····		<del></del>	·
19	77	-4, 9	3.0	2.9	10.4	14.7	18.2	22.5	23.3	18.9	8.1	7.0	-1.8	10.2
19		-2.5	1.2	4.5	7.8	14.2	17.9	25.3	22. 2	19.6	12.9	1.3	2.1	10.5
19		0.3	3.0	5.0	10.0	14.9		21.5	25.4	20. 1	11.4	6.6	0.3	11.3
19	80	-0.7	2.0	4.0	9.0		20.7	25. 4	22. 1	17.5	10.6	6.9	2.5	11.3
19	81	0.9	1.9	5. 1	8.2	12.2	18.7	24.6	22. 4	19.7	13. 2	4.2	3.8	11.2
19	82	-1.1	-2.6		10.5		20.0	22. 2	22.3	18.4	11.1	2.6	0.4	10.0
19		-1.3	-0.8	3, 4	10.4	14.6		24. 3		17.6	11.1	6.9	0.8	10.7
19		0.8	0.3	5.0	8.8		18.8	22. 2	20. 1	17.1	10.9	5.9	2.8	10.5
19		0.3	-0.1		10.7	17. 1	20.7	22. 1	24.7	17.2	9.6	7. 2	-0.1	10.8
19		-0.8	-0.6	2.6	11.6	11.3		25.4	25.3	20.1	11.8	2.4	-1.9	10.5
19		0.4	0.7	-0.9	6, 7	16.5	19.8	23. 3	21.6	17.1	9.7	3. 2	-0.7	9.8
19	88	~3.6	-1.0	2.1	9.4	13.7	18.0	22.5	21.6	17.0	11.3	1.9	0.4	9.4
19	89	-5, 7	-3.5	5. 1	13. 3	15.4	20.6	24. 2	24.6	17.4	10.7	4.7	-2.8	10.3
19					:									

Ave -1.4 0.3 3.1 9.8 14.5 19.1 23.5 23.0 18.3 11.0 4.7

Note: X>0 Y(Tortum p/s) = 1.136(Tortum) + 0.83 X<0 Y(Tortum p/s) = 0.8803(Tortum) + 0.83



0.4 10.5

Fig. A-2-3 Relation between Monthly Average Temperatures and Monthly Evaporation of Tortum Power station

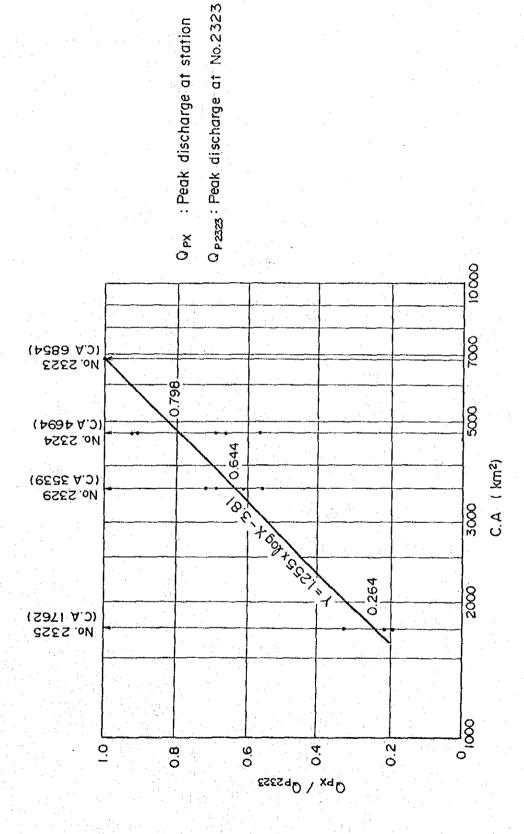


Fig. A-2-4 Relation between Coefficient for Peak Discharges and Catchment Area of any site

0000 į (6)

m <sup>2</sup> )	
MCM) (m³/s/100km²	0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.
(Unit: Total	20000000000000000000000000000000000000
d'es	400004F 4044000F 9000000 9000 4000 90000000 44 0000040000000000
Aug	84188040001-840801-80001-800001-8000
Jul	888800880088044100 84 84 84 84 84 84 84 84 84 84 84 84 84
Jun Ju	22 24 18 12 25 25 25 25 25 25 25 25 25 25 25 25 25
May	88888188888888888888888888888888888888
Apr.	1122111 112211 112211 1222 1132 133 133
Mar	
Feb	$\begin{array}{c} \mathbf{R} \mathbf{R} \mathbf{A} \mathbf{A} \mathbf{A} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{A} \mathbf{A} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} \mathbf{R} R$
Jan	$\begin{array}{c} Residual descendent desc$
Dec	$\begin{array}{c} \mathbf{vo}  \mathbf{vo} $
Nov	
0ct	て 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
Year	4114444444444444444444444444444444444
	AP-2-5

Table A-2-1(b) Natural Flow at No.2323 Gauging Station

44.9 40.2 35.1 35.3 40.7 56.4 159.0 404.0 185.0 70.8 41.9 31.3 1144.6 57.2 100.0 55.5 45.7 41.2 63.8 255.0 302.0 224.0 216.0 123.0 39.4 32.5 1015.8 57.2 100.0 55.5 45.7 41.2 63.8 255.0 302.0 93.6 47.0 32.8 24.1 1115.9 47.2 40.1 32.4 40.1 32.4 40.1 25.0 40.1 25.6 37.9 981.4 47.9 45.1 48.6 49.6 34.6 34.6 34.6 33.0 40.1 25.0 40.1 25.6 37.9 981.4 38.8 38.8 38.8 39.9 51.1 182.0 533.0 242.0 93.1 49.8 678.6 470.9 38.8 38.8 38.8 39.9 51.1 182.0 244.0 241.0 57.9 43.1 42.9 1120.8 38.8 38.8 38.8 38.8 38.8 38.8 38.8 3	0ct	Nov Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total (m³	$Total~(m^3/s/100km^2$
38. 6       38. 2       44. 4       131. 0       224. 0       216. 0       123. 0       39. 4       32. 5       1015.         20. 0       55. 5       45. 7       41. 2       63. 8       253. 0       302. 0       63. 6       47. 0       32. 8       24. 1       1115.         2. 0       37. 4       40. 1       25. 0       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       30. 0       46. 1       46. 1       46. 3       47. 0       46. 3       47. 0       46. 3 <t< th=""><th>4</th><th>35.</th><th></th><th>1 6</th><th></th><th>159.0</th><th>404.0</th><th>185.0</th><th></th><th></th><th></th><th>1144 8</th><th></th></t<>	4	35.		1 6		159.0	404.0	185.0				1144 8	
7.2     100.0     55.5     45.7     41.2     63.8     253.0     302.0     63.6     47.0     32.8     24.1     1115.2       2.0     37.2     40.1     32.4     40.4     101.0     210.0     210.0     71.2     41.0     46.1       45.1     48.6     49.6     34.6     182.0     308.0     123.0     40.1     25.6     37.9     981.0       2.2     51.1     45.5     44.3     39.9     51.1     182.0     53.3     242.0     43.3     30.7     43.8     67.9       2.2     51.1     44.3     39.9     51.1     182.0     242.0     33.1     49.8     43.0     141.7       3.6     38.0     38.1     200.0     190.0     90.0     41.8     42.9     170.       38.0     38.0     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.9       44.4     38.6     44.1     55.1     204.0     660.0     234.0     81.5     55.8     1569.3       4.5     41.8     45.6     67.1     234.0     46.9     46.9     46.9     46.9       4.1     53.5     46.9     41.9     46.9     46.9     46.9     4	œ,	43.	ഹ	00		131.0	224 0	216.0				1015 8	
2.0     87.4     40.1     32.4     40.4     101.0     210.0     210.0     71.2     41.0     46.1     908.1       7.9     45.1     48.6     49.6     39.0     182.0     308.0     123.0     40.1     25.6     37.9     981.       2.2     51.1     45.5     44.3     39.9     51.1     182.0     533.0     242.0     43.8     67.8       2.2     51.1     45.9     51.1     182.0     533.0     242.0     93.1     49.8     67.8       2.2     51.1     46.9     51.1     182.0     242.0     93.1     49.8     43.0     141.7       3.6     88.0     32.0     244.0     244.0     244.0     244.0     57.9     43.1     42.9     1120.0       3.7     41.9     69.2     226.0     244.0     244.0     57.9     43.1     42.9     1120.0       3.7     41.8     45.6     67.1     234.0     81.5     62.7     37.6     839.       4.5     41.8     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       3.4     41.5     41.5     221.0     407.0     141.0     80.7     46.3     45.3 <td< td=""><td>٠.</td><td>0 55.</td><td>٠. دم</td><td></td><td></td><td>253.0</td><td>302.0</td><td>9.89</td><td></td><td></td><td></td><td>1115.9</td><td>0.52</td></td<>	٠.	0 55.	٠. دم			253.0	302.0	9.89				1115.9	0.52
7.9     45.1     48.6     49.6     34.6     59.0     182.0     308.0     123.0     40.1     25.6     37.9     981.       2.2     51.1     45.5     44.3     39.9     51.1     182.0     533.0     242.0     43.3     30.7     43.8     678.       2.2     51.1     45.5     44.3     39.9     51.1     182.0     533.0     242.0     93.1     49.8     43.0     1417.       7.6     39.8     31.0     28.1     38.8     200.0     190.0     90.0     41.8     16.5     25.3     770.       8.8     38.0     38.7     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.9     1120.       9.7     44.4     58.6     47.1     204.0     660.0     234.0     81.5     62.7     37.6     157.       4.5     41.8     45.6     67.1     234.0     485.0     282.0     144.0     68.3     45.8     156.9       3.1     70.1     53.5     46.9     41.9     77.5     221.0     141.0     80.7     46.3     45.3     1229.       3.4     50.7     41.5     221.0     407.0     141.0     80.7     46.3 <t< td=""><td>2</td><td>37.</td><td><u>.</u></td><td>N/</td><td></td><td>101.0</td><td>210.0</td><td>210.0</td><td></td><td></td><td></td><td>808</td><td></td></t<>	2	37.	<u>.</u>	N/		101.0	210.0	210.0				808	
9.6     38.8     38.1     31.8     29.7     34.6     64.2     151.0     133.0     43.3     30.7     43.8     678.       2.2     51.1     45.5     44.3     39.9     51.1     182.0     533.0     242.0     93.1     49.8     43.0     1417.       7.6     39.8     31.0     22.0     24.0     241.0     90.0     41.8     16.5     25.3     770.       8.8     38.0     38.7     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.3     1120.       9.7     53.5     44.4     55.1     204.0     660.0     234.0     81.5     62.7     37.6     1575.       4.5     67.1     234.0     485.0     282.0     144.0     68.3     55.8     1569.       3.1     70.1     53.5     46.9     41.9     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       1.6     50.7     41.5     26.1     230.0     407.0     141.0     80.7     46.3     45.9     1229.	<u>_</u>	1 48.	<u>.</u>	4		182.0	308.0	123.0				981.4	
2.2     51.1     45.5     44.3     39.9     51.1     182.0     533.0     242.0     93.1     49.8     43.0     1417.       7.6     39.8     31.0     32.0     28.1     38.8     200.0     190.0     90.0     41.8     16.5     25.3     770.       8.8     38.0     39.3     38.7     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.3     1120.       9.7     53.5     44.4     58.6     44.1     55.1     204.0     660.0     234.0     81.5     62.7     37.6     1575.       4.5     61.8     45.6     67.1     234.0     485.0     282.0     144.0     68.3     55.8     1569.       3.1     70.1     53.5     46.9     41.9     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       1.6     50.7     41.5     36.6     76.1     230.0     407.0     141.0     80.7     46.3     45.9	G.	38.		o,		64.2	151.0	133.0				678.6	
7.6     39.8     31.0     32.0     28.1     38.8     200.0     190.0     90.0     41.8     16.5     25.3     770.       8.8     38.0     38.7     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.9     1120.       9.7     53.5     44.4     38.6     44.1     55.1     204.0     660.0     234.0     81.5     62.7     37.5     1575.       4.5     63.2     47.8     45.6     67.1     234.0     485.0     282.0     144.0     68.3     55.8     1569.       3.1     70.1     53.5     46.9     41.9     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       1.6     32.4     50.7     41.5     36.6     76.1     230.0     407.0     141.0     80.7     46.3     45.3     1229.	<u>دع</u>	1 45.	<del>_</del> ;	တ		182.0	533.0	242.0				1417.0	
8.8     38.0     39.3     38.7     41.9     69.2     226.0     244.0     241.0     57.9     43.1     42.9     1120.0       9.7     53.5     44.4     38.6     44.1     55.1     204.0     660.0     234.0     81.5     62.7     37.6     1575.       4.5     53.2     47.8     41.8     45.6     67.1     234.0     485.0     282.0     144.0     68.3     55.8     1569.       3.1     70.1     53.5     46.9     41.9     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       1.6     32.4     50.7     41.5     36.6     76.1     230.0     407.0     141.0     80.7     46.3     45.3     1229.	<b>~</b> -	31.	دع	φ.		200.0	190.0	90.0				770.9	
9.7     58.5     44.4     38.6     44.1     55.1     204.0     660.0     234.0     81.5     62.7     37.6     1575.       4.5     63.2     47.8     41.8     45.6     67.1     234.0     485.0     282.0     144.0     68.3     55.8     1569.       3.1     70.1     53.5     46.9     41.9     77.5     221.0     120.0     74.2     34.8     19.1     27.6     839.       1.6     32.4     50.7     41.5     36.6     76.1     230.0     407.0     141.0     80.7     46.3     45.3     1229.	∞.	39.	<u>~</u> :	-4		228.0	244.0	241.0				1120.8	
4.5 53.2 47.8 41.8 45.6 67.1 234.0 485.0 282.0 144.0 68.3 55.8 1569. 3.1 70.1 53.5 46.9 41.9 77.5 221.0 120.0 74.2 34.8 19.1 27.6 839. 1.6 32.4 50.7 41.5 36.6 76.1 230.0 407.0 141.0 80.7 46.3 45.3 1229.	œ.	5 44.	an'	4		204.0	660.0	234.0				1575.2	
3.1 70.1 53.5 46.9 41.9 77.5 221.0 120.0 74.2 34.8 19.1 27.6 839. 1.6 32.4 50.7 41.5 36.6 76.1 230.0 407.0 141.0 80.7 46.3 45.3 1229.	-j	2 47.		ς.	67.1	234.0	485.0	282.0				1569.1	
1.6 32.4 50.7 41.5 36.6 76.1 230.0 407.0 141.0 80.7 46.3 45.3	es.	1 53.		,i	77.5	221.0	120.0	74.2				839, 7	
	Ţ	4 50.	_;	ø,	16.1	230.0	407.0	141.0				1229.2	
	. C. 75.	51 1	6 Y Y	6 6 7	6		000			·			

Note ; (1) 1940/10---1963/ 9 : log Y = 0.088 \* X(No.2302) + 0.704

Table A-2-2 Natural Flow at No.23-24 Gauging Station (C. A = 4, 693. 6  $\,\mathrm{km}^2$  )

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	(Unit: MCM Total (m	M } (m <sup>3</sup> /s/100km <sup>2</sup> )
1977	ြင	ിഗ		ا. ا	26.5	;, ا	118.0	246.0	87.9			24.6	ی ا	
1978	S	27.0	23.9	23.7	28.5	46.8	121.0	318.0	108.0	23.4	13.4	16.6	779.9	0.53
1979	ŝ	7		~.	24.1	⟨;	117.0	193.0	140.0			15.9	~	
1980	8	83		_ :	27.5	<u>.</u> .	207.0	185.0	31.7			15.4	-	
1981		0		٠.	17.5	4	78.3	156.0	211.0			17.9	Ψ.	
1982	~	ç		_:	18.0	φ.	161.0	229.0	59.1			18.4	တ်	
1983	21.0	18.8	17.8	شند	16.7	.;	44.8	90.4	47.8			13.1	92	
4 8 8 4 4 8 4 4 8 4 4 8 4 8 4 8 4 8 4 8	-1	30.2	L.	•0	-41	673				2				
1986	26.7	24.2	24.5	23.0	25.0	40.1	161.0	150.0	130.0	23.5	10.4	18.0	656.4	0.44
1987			ω.	ŝ	<u>, -</u> ;	34.5				ທ່	15.5		~:	
1988				:		i.								
න ද න ද න ද					•									
0881														
Ave	28.4	29.2	25.7	23.6	24.0	34. 4	128.7	210.1	94.7	25.0	12.9	16.8	653,6	0.44
,		,			, ,			t .						

Table A-2-3 Natural Flow at No.2329 Gauging Station (C.A = 3,538.8 km²)  Dec Jan Feb Mar Apr May Jun 14.8 15.2 12.4 17.6 119.0 152.0 26.5 12.1 19.2 16.0 26.1 13.0 156.0 70.0 22.1 19.1 19.0 18.8 34.5 124.0 256.0 70.0 26.1 13.0 156.0 113.0 20.8 18.5 25.8 26.1 130.0 349.0 79.3 18.6 17.3 19.6 30.6 130.3 240.6 212.2 23.1 19.0 15.2 42.2 132.5 42.6 11.2 22.9 14.6 13.8 37.5 151.5 232.1 64.0
Dec Jan 19.5 14.8 13.4 22.1 19.2 22.0 19.1 18.0 21.5 18.0 23.1 19.0 22.9 18.5 18.5 23.1 19.0 22.9 14.6
n: 41000 1101 1101

Table A-2-4 Natural Flow at No.2325 Gauging Station (  $\rm C.~A~=~1,~762~km^2)$ 

								(C.A = 1,	762 km²)					
			4.	. •	e V			r					unit ; W	MCM )
Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	total	$(m^3/s/100 km^2)$
						0.	26.70		~		•	l '	-	
5	_					00			· ~					
1976	16.30	8.90	9.30	12.00	7.64	14.70	73.50	94.40	38.20	14, 10	30.0	- တ	20 S	0 C
9			-			~			0				,	
6		1.6				وي			į'				140	
6		တ		-		ci			۳.				~	
198						c			က	1.0			· <>	
800					_	Ö			~;				-	
0									∞;				o,	
55.					_				œ.	٠.			w.	
SO 4		_							S.	_			<u>.</u>	
1985					_				c)	٠.			ac	
1986		ω.							ŝ				ما	
1987					_				ć	1			·co	
8851		ું.							o;				œ.	
1989		7		9.02									œ	
										٠. ا				
Ave	11.27	11.99	11,14	9.20	8.49	13.66	48.48	68.83	22.05	8. 28	4.94	7.23	225.54	0.41

Table A-2-5 Observed Monthly Temperatures at Oltu Station

1											(unit	: 'C)	:
Year	Ian	Fev	Mar	Apr	May	Jun	Jul	Aug	Sep	0ct	Nov	Dec	۸ve
	•												
				. :									
1968	-4.9	-3.5	2.0				22.5		18.3	12.5		-1.3	9. 7
1969	-4.4	-4.3	4.1		15.9	20.4	21.2	23.4	16.5	9.9	5.0	1.4	9. 7
1970	0.4	2.4	6. 1	13.0	14.6	18.8	22. 3		16. 9	10.3	7.4	-3. 5	10.8
1971	-2.1	-0.9	5.0	9.6	14.9	16. 9	24.5	19. 9	20. 5	9.7	4.5	-3.2	9. 9
1972	-9.4	-5.0	2.1	11.5	12.5	17.4	22.8	23.0	17.6	-13.7	3. 3	-3.4	8.8
1973	-6.4	-0.1	2.5	8.9	14.4	16.1	21.8	22.6	18.4	12.2	0.6	-1.8	9. 1
1974	-7.8	-3.5	3.7	6.3	15. 7	20.7	22. 2	20.9	15.8	15.5	5.4	-0.2	9.6
1975	-2.5	-2.7	1.9	12.6	14.1	20.0	23. 7	23. 4	17. 2	10.1	4. 0	-5.0	9. 7
1976	-5.6	-9.5	0.9	8.7		18.0	20.9	23.3	16.8	11.6	6. 1	0.5	8.8
1977	-5.7						21.0		18.1	7.8	6.2	-2.5	9.4
1978	-4.9	0.4	$5.\overline{9}$	8. 4	13.8		24. 0			12.5		0.7	10.0
1979	0.3	2. 9	4.9	9.7	14. 4	17.1	20. 8	24. 5	19. 5	11.0	6. 4		11.0
1980	-0.7	1.9	3.9	8.7	15. 2	20.0			16.9				10.9
1981	-0.2		5.3	8.1	11.5	18. 1		22. 2		12.9		3.5	10.8
1982	-0.3		2.9	10.8	14.6	18.6		21.3		10.4	2. 5		9.8
	-3. 2		4.5	10.6	14. 5	17.6		21. 9	16.9	10. 4	6. 1	1.4	10.3
	0.9	0. 4	5. 4	9.1	12.3	18.5	22. 4	19. 4	19.0	10.8	5. 0	-0.8	10. 2
1985	-0.5		1.8		16.5	19.7	21. 0			9.5		-1, 7	10. 3
		-1. 7		11.5	11.3		23. 8	24. 4			3. 2	-2.3	9.8
	-3.0											-1.3	9.5
1987	-0.7	0.8	0.5	7.8		18.3	22. 7	20. 9	16.2	9.6			
1988	-6.4	-1, 6	3.0	10.0	13.5	17.1	21.5	20. 5	16.6	10.5		-0.6	8.9
1989	-8.2	-4.9	6.0	13. 2	15. 1	19.4	23.3	24.5	18. 1	10.7	5. 2	-4.0	9.9
1990										•			
												·	

Ave -3.4 -1.3 3.6 9.9 14.3 18.2 22.4 22.1 17.8 11.0 4.6 -1.0 9.9

Deficit data 1973/6-12, 1974/3-9, 11, 12, 1975/1-10, 1977/10, 1979/1-1980/12,

; X>0 Y(01tu) = 1.096 \* X(Tortum) + 0.83

;  $X<0 \ Y(01tu) = 0.912 * X(Tortum) + 0.83$ 

Table A-2-7 Sediment Yield from Calculation for 16 years (No.2325; C.A = 1,762 km²)

Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	(unit : t Sep	on ) Total	ton/km2
<u>.</u>	7.6	2,5	•			۵		. ~	808		1	168 601	05 60
- 0	- 0	> 0		- r				; ,	0 6			100	200
?	-	, c.		3.		χ,		٠,		4	- 4	137,563	78.07
2	8	7	_	32		မ		٠.		٦.		677, 523	384.52
'n	9	00		00.		S		'n.		٠.		678,929	385, 32
₩	8	03		. 24		ω.		ထ		٥,		740,174	420.08
m	52	26		23		6		မ		36		139, 132	78.96
∞	200	55		S.		ີຕໍ		∞;		~~		540,847	305,95
m	38	7.7		.08				_;		w		196, 292	111.40
က	, 54	64		7.0		ഹ		-4		219		253,804	144.04
1	5.5	55		80				ς,		269		43,742	24.83
~	77	13		32		-c#		14,306	-	2, 103		709, 122	402.45
တ	34	31	_	98		_		1,748		48		318,924	181.00
ຕາ	9	59		36		5		103, 700		110		360, 130	204.39
မ်ာ	39	88		98		~		15.687		•		1,015,463	576.31
ന	36	73		57		m		56,889		O3		746,233	423.51
נט	rc.	3	-	.09		veH.		233	2			177,164	100.55
4 932	5 988	4.871	3 160	2 987	7 300	115.497	250 038	26.510	5.134	2.623	2.439	431.478	244.88
<ul><li>のこののののののののののののののののの</li><li>は トナイナインのののののののののののののののののののののののののののののののののの</li></ul>		0 ct 1.2.2.2.0.1	0ct Nov Dec 2, 266. 1, 777 4, 3 1, 119 2, 266. 1, 777 4, 3 1, 119 2, 935 3, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	0ct Nov Dec Jan 12, 119 2, 266 1, 777 4, 357 3, 0 4, 938 4, 303 4, 938 7, 009 4, 0 8, 709 14, 780 1, 811 3, 034 2, 1 8, 709 14, 780 1, 811 3, 034 2, 1 1, 83 1, 143 1, 541 1, 569 1, 81 1, 569 1,	0ct Nov Dec Jan Fe. 12, 119 2, 266 1,777 4,357 3,011 2, 266 1,776 2,338 1,821 1,821 1,821 1,716 2,938 3,958 3,958 3,958 3,958 3,522 3,145 5,178 2,116 7,009 4,002 3,958 3,522 3,145 5,178 5,541 4,564 5,399 2,399 2,396 6,347 4,319 2,948 3,592 2,049 2,593 3,456 2,948 3,592 2,049 2,593 3,456 2,541 19,379 3,332 2,541 19,379 3,150 2	0ct Nov Dec Jan Feb Ma 7,015 6,777 4,357 3,011 2,787 16, 2,266 1,777 4,357 3,011 2,787 16, 12,119 2,935 3,145 5,178 2,326 8, 5,790 4,998 7,009 4,002 3,002 5, 8,709 14,780 8,730 4,002 3,002 5, 8,709 14,780 8,730 4,002 3,002 5, 1,897 1,554 1,569 2,930 3,287 3, 1,554 1,569 1,776 2,795 1, 1,554 1,569 1,788 2,795 1, 2,779 8,347 4,319 2,399 2,366 4, 8,395 4,882 4,382 2,948 3,573 7, 8,456 2,541 19,379 3,332 2,097 13, 6,335 5,385 4,871 3,160 2,987 77	0ct Nov Dec Jan Feb Mar Apr 7,015 6,777 4,357 3,011 2,787 16,776 28, 2,266 1,777 4,357 3,011 2,787 16,776 28, 5,790 4,998 7,009 4,002 3,002 5,746 52, 4,303 3,811 3,034 2,116 7,242 9,180 88, 8,709 14,780 6,730 4,678 4,350 11,270 393, 3,843 3,883 2,773 4,678 4,350 11,270 393, 2,773 5,138 85, 1,897 1,554 1,569 1,818 1,089 2,049 7, 2,774 5,138 85, 2,775 6,138 85, 2,775 6,142 3,151 2,399 2,360 4,652 65, 6,852 5,395 4,882 4,667 8,965 6,116 68, 3,456 4,364 8,71 3,73 3,332 2,097 13,136 94,	0ct Nov Dec Jan Feb Mar Apr May 12, 126 1, 126 28, 244 14, 357 3, 011 2, 787 16, 776 28, 244 74, 2, 266 1, 776 2, 339 1, 821 1, 524 7, 205 2, 307, 3, 145 5, 178 2, 326 8, 629 266, 326 307, 3, 383 3, 3145 5, 178 2, 326 8, 629 266, 326 307, 3, 358 3, 311 3, 034 2, 118 2, 326 8, 629 266, 326 307, 3, 358 3, 311 3, 034 2, 118 2, 326 3, 746 52, 977 556, 328 3, 358 3, 328 3, 33	Oct         Nov         Dec         Jan         Feb         Mar         Apr         May         Jun           7,015         6,777         4,357         3,011         2,787         16,776         28,244         74,809         13,           2,266         1,776         2,339         1,524         7,205         28,244         18,809         18,746         18,247         18,746         18,746         18,746         18,746         18,746         18,746         18,746         18,746         18,746         18,747         18,746         18,747         18,748         18,747         18,748 <td>Oct         Nov         Dec         Jan         Feb         Mar         Apr         May         Jun           7,015         6,777         4,357         3,011         2,787         16,776         28,244         74,809         13,717           2,266         1,776         2,339         1,821         1,524         7,205         23,107         66,418         26,952           4,303         3,145         5,178         2,326         3,66         326         307,466         57,488           4,303         3,004         2,116         7,242         9,180         36,324         26,245         15,136         26,356         294         15,136         26,356         294         26,356         295         15,136         26,347         26,294         30,13         36,248         26,294         36,248         36,248         36,248         36,248         36,248         36,248         36,248         36,248         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,369         36,369         36,369         36,369         36,369         36,369         36,369         36,369         36,388         36,369         36,368</td> <td>Oct         Dec         Jan         Feb         Mar         Apr         May         Jun         Jul         Au           7,015         6,777         4,357         3,011         2,787         16,776         28,244         74,809         13,717         308         4.           2,266         1,776         2,339         1,524         7,205         23,107         66,418         26,952         920         4.           12,119         2,936         3,002         5,746         52,977         66,418         26,952         4.         92         66,418         26,952         4.         92         92         66,218         56,295         15,136         7.         180         4.         180         7.         180         4.         180         1.         180         1.         180         1.         1.         180         1.         180         1.<!--</td--><td>0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep (unit: 7.015 6,777 4,357 3.011 2.787 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.266 1.776 2.339 1.821 1.524 7.205 23,107 86,418 26,529 7.717 4,377 4,377 4,377 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.12119 4,988 7.009 4.002 5,746 86,23,107 86,418 26,529 7.189 1,100 3,175</td><td>0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Total  2.266 1.776 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.777 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.776 2.339 1.524 7.205 23.107 66.418 26.952 7.189 1.100 3.752 2.763 137.56  3.104 4.998 7.009 4.002 3.002 2.65.297 556.295 15.136 3.826 16.973 3.756 78.92  3.105 3.105 4.998 7.009 4.002 3.002 5.766 52.977 556.295 15.136 16.973 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.766 52.977 556.295 15.136 1.100 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.765 29.180 8.328 58.747 28.812 1.712 3.83 1.956 740.17  3.105 3.105 5.138 2.956 4.002 3.002 3.004 4.002 3.004 1.100 5.104 5.1</td></td>	Oct         Nov         Dec         Jan         Feb         Mar         Apr         May         Jun           7,015         6,777         4,357         3,011         2,787         16,776         28,244         74,809         13,717           2,266         1,776         2,339         1,821         1,524         7,205         23,107         66,418         26,952           4,303         3,145         5,178         2,326         3,66         326         307,466         57,488           4,303         3,004         2,116         7,242         9,180         36,324         26,245         15,136         26,356         294         15,136         26,356         294         26,356         295         15,136         26,347         26,294         30,13         36,248         26,294         36,248         36,248         36,248         36,248         36,248         36,248         36,248         36,248         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,348         36,369         36,369         36,369         36,369         36,369         36,369         36,369         36,369         36,388         36,369         36,368	Oct         Dec         Jan         Feb         Mar         Apr         May         Jun         Jul         Au           7,015         6,777         4,357         3,011         2,787         16,776         28,244         74,809         13,717         308         4.           2,266         1,776         2,339         1,524         7,205         23,107         66,418         26,952         920         4.           12,119         2,936         3,002         5,746         52,977         66,418         26,952         4.         92         66,418         26,952         4.         92         92         66,218         56,295         15,136         7.         180         4.         180         7.         180         4.         180         1.         180         1.         180         1.         1.         180         1.         180         1. </td <td>0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep (unit: 7.015 6,777 4,357 3.011 2.787 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.266 1.776 2.339 1.821 1.524 7.205 23,107 86,418 26,529 7.717 4,377 4,377 4,377 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.12119 4,988 7.009 4.002 5,746 86,23,107 86,418 26,529 7.189 1,100 3,175</td> <td>0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Total  2.266 1.776 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.777 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.776 2.339 1.524 7.205 23.107 66.418 26.952 7.189 1.100 3.752 2.763 137.56  3.104 4.998 7.009 4.002 3.002 2.65.297 556.295 15.136 3.826 16.973 3.756 78.92  3.105 3.105 4.998 7.009 4.002 3.002 5.766 52.977 556.295 15.136 16.973 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.766 52.977 556.295 15.136 1.100 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.765 29.180 8.328 58.747 28.812 1.712 3.83 1.956 740.17  3.105 3.105 5.138 2.956 4.002 3.002 3.004 4.002 3.004 1.100 5.104 5.1</td>	0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep (unit: 7.015 6,777 4,357 3.011 2.787 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.266 1.776 2.339 1.821 1.524 7.205 23,107 86,418 26,529 7.717 4,377 4,377 4,377 16,776 28,244 74.809 13,717 308 4.659 6,1441 2.12119 4,988 7.009 4.002 5,746 86,23,107 86,418 26,529 7.189 1,100 3,175	0ct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Total  2.266 1.776 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.777 4.357 3.011 2.787 16.776 28.244 74.809 13.717 308 4.659 6.141 168.60  2.266 1.776 2.339 1.524 7.205 23.107 66.418 26.952 7.189 1.100 3.752 2.763 137.56  3.104 4.998 7.009 4.002 3.002 2.65.297 556.295 15.136 3.826 16.973 3.756 78.92  3.105 3.105 4.998 7.009 4.002 3.002 5.766 52.977 556.295 15.136 16.973 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.766 52.977 556.295 15.136 1.100 3.175 678.92  3.105 3.105 4.002 3.002 3.002 5.765 29.180 8.328 58.747 28.812 1.712 3.83 1.956 740.17  3.105 3.105 5.138 2.956 4.002 3.002 3.004 4.002 3.004 1.100 5.104 5.1

Table A-2-8(a) Sediment Yield from Calculation for 50 years (No.2325; C.A = 1,762 km<sup>2</sup>)

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(MCM)	513.0	 	200	000	00	မ ဆ	64	ກ່ແ		ur?	တ်၊	L		, c 8 2, c	35,	on On	က္လ	2 4	# <u></u>		89	со СО	02.	27	, ~ ∟ O 0	2 ~~	5.
ton/km3	424.5 871.2	20.	41.	484	83		83	73.		50	73.	<u>.</u>	4.4	3 to	41,	02.	9 5	20.2	 -i cc > cc	88	78.	30.	3 .		, 0 u	) u.	60
ton ) Total (	747,939 1,182,628	94,05	26, 10	61, 45	75,62	21.11	80,94	75, 93	28, 93	65, 37	03, 29	70, 70	48, 20	26.71	73, 70	79, 76	86,36	40,35	2, 40	12, 10	48,58	82,72	61,64	48,81	- A - A - A - A - A - A	68. FO	37,58
(unit : to Sep	25.00 20.00	, ∞ , ∞	2:	- 8	.82	2.0	8			5	, 46	€7 C	) ) )	 	23	٠ ج	97.4	,	<b>عه</b> د	ςςς - αςς	. 26	, 50	დ. დე	∞ ¢	. a	7	7.5
Aug	6, 0, 11 0, 0, 10 0, 10	20	4.0	50	63	တ္ထ	6.73	200	38	1,05	σ.	200	ک ت د	20.	36	<u></u>	80.4	a, n	- O	202	69	5	77	200	- C	3 62	4.7
Jul	18,544	8,515	96.6	. 53 53 53	2.94	≈ .∞ _ ± .∞ _ ± .	1,21	25	200	3,02	5,65	1, 21	5 u		96	7,43	9 6	e Se Se Se Se Se Se Se Se Se Se Se Se Se	5, C	2,5	54	3,10	43	თ. ლ.	оп 200	\$ <del>6</del>	· 6/3
Jun	63,533	700	က လူလို	46,00	7,01	$\frac{3}{2}$ $\frac{19}{2}$	31, 32	7, 96	10,76	41,38	တ တ	5	٦, د د د	2, - 2, - 43	0,87	29, 99	0,66	000 000 000 000	200	3, 15	4,45	4, 73	6, 73	9,64	, c , c	30.	cur).
Мау	487.066	0,18	22	44.0	7. 58	2 2 5 2 5 3	3.58	3 50	7.04	7,96	68	2,46	 	~ 8 2 8 4 8	6, 29	0.68	2.43	~ u ~ c	7 60	8 8 2	1,08	4,59	0,59	7,00	\$ 0 \$ 10	, c	6,41
Apr	123, 293	4,98	96.0	2 ° ° °	8,51	4 8 8 9 5 5 5 5	7.42	0 0 0 0 0 0	25	1,64	1,00	5,20	2 6	- K	8,71	7,06	8,00	-i c	2 C	1,81	0,38	14,55	დ - 1	80	7 C	2 K	3, 10
Mar	11,557	9 69	800	. 7.	Ξ.	88	26	ວາ ແ ວາ ແ	000	95	23	∞;	0 0	9 -	88	7.	75	2 6	ກ ທ - ເວ	22	68	60	52	6	, O C		20
Feb	6,116	2 80	~ .	77	ŝ	04	∞ (	 	- 7	30		S	ر در در	300	8	26	8	o u	200	20	46	တိ	0.	ω c		. c.	· (v)
Jan	5, 179	200	40	80	67	33	22	ic	ဗိ	Ξ.		50.0	2	28 28	32	43	Q 1		40	~	7	63	7	ک اس ر			7 00
Dec	6, 281 8, 092 795	급등	∞ <u>-</u>	70	64	ω <u>r</u> ~ σ	7.5	∞ rc	40	78	C.	က က (	~ C	7 8	0.5	လ က	က	- 6	, Q	0.0		2,	23	<u>م</u> د	יי קר איי קר	4 0	, es
Nov	18, 198	24	4	- 65	41	O 66 Or TO	200	ე დ	29	တ	00		9 4		0	က	(C)	0.0	# 01 0 02	83	90	30	63	0 4	e 6	) [-	<u>.                                    </u>
Oct	9,362	25	36	- 4	∞.	63 12 63	0.5	30.50	200	0.2	·~·		0 4	4.4	68	95	25	, , , , ,	7.0	2		07	5	7,0	7 U	3 5	160
Year	1941	3 C2	(C) (C)	9.4	94	9 9 5	Q2 4	e Cr	9 5	CLS :	9	ρ (2) (2)	n c	ကြေ	96	96	9 6	30 C	9 6	9	9	96	9	رت 1 س	- r	. c	, QJ

Table A-2-8(b) Sediment Yield from Calculation for 50 years

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Ju1	Aug	Sep	Total	(ton/km)	(MCM)
26	11	ဂ					266.326					52		384.	
1977	7.9	ග					52,977			3,826	16,973	3,175		385	
97	30	∞.	_				88, 328					8		420.	
97	95	ъ.					29, 566					9		78	
1980	70	<u></u>	_	_			393, 102				2, 115	8		307	
98	∞,	es es	_	_			96,345				823	35		111.	
1982	14	ഹ	_				85,360				219	45		144.	
98	<u>თ</u>	rcs.	_	_			7,918				269	41		24.	
တ	2, 779	5, 142	3, 151	2, 399	2, 328	4,279	84,360	578, 234	14,306	6.957	2,103	3,084	709, 122	402.5	260.4
8	တ္	ധ		_			230, 765				8₹	63		181.	
98	7.0	യ					65,355				110	62		204.	
8	85	ິ		_	_		68.246					51		576.	
1988	<u>م</u>	ഷ					233,059			35,614	10,937	77		423	
1989	08	٦.			2,097	13, 136	94,899		233			99		100.	

302.9

84,753 18,118 6,274

83,824 262,401

3, 304 7, 441

Ave 5,246 6,185 4,854 3,746

1940/10---1973/ 9 : LogQs=1.928\*LogX(No. 2325)+1.69 1973/10---1989/ 9 : Sediment Yield from Calculation for 16 Years

(1) RivNote :(1) River Discharge 1940/10---1973/ 9 : Q=0.8844\*X(No.2329)+1.02 1973/ 9 : No.2325 
(2) Suspended S(2) Suspended Sediments Discharge 
1940/10---1973/ 9 : LogOs=1.928\*LogX(No.2325)

Table A-2-9(a) Flood Peak Discharges

(unit: m<sup>1</sup>/sec)

	No. 2323			(unit; m'/so No.23-24	**************************************
Date		charge	Date	Disc	charge
	Peak	Max i mam		Peak	Maximam
18 Apr 1965	154		1965	( 123 )	
2 Hay 1966	191	}	1966	( 152 )	
13 Hay 1967	249		1967	( 199 )	
18 Apr 1968	472		1968	( 377 )	
30 Apr 1969	378		1969	( 302 )	
15 Apr 1970	146		1970	( 117 )	
17 Hay 1971	165		1971	( 132 )	
1 Hay 1972	174		1972	( 139 )	÷
12 Hay 1973	205		1973	( 164 )	
13 Apr 1974	231		1974	( 184 )	
15 Hay 1975	99.8		1975	( 79.6)	
21 Hay 1976	227		1976	( 181 )	
14 Hay 1977	220		7 Hay 1977	210	
18 May 1978	295		18 Hay 1978	270	
14 Jun 1979	230		14 Jun 1979	210	
11 Apr 1980	263		11 Apr 1980	290	
5 Jun 1981	196		5 Jun 1981	110	
19 May 1982	224	191	2 May 1982	170	
18 Hay 1983	97.8	89.7	18 Hay 1983	68.0	
20 Hay 1984	504	476	12 Hay 1984	112	· •
23 Apr 1985	250	189	23 Apr 1985	150	135
16 Apr 1986	233	179	16 Apr 1986	155	125
21 Hay 1987	377	356	10 Hay 1987	270	260
19 Hay 1988	* 320	286	1988	( 255 )	•
15 Apr 1989	* 186	150	1989	( 148 )	
28 Apr 1990	* 374	341	1990	( 299 )	

Note; 1) Figure with \* are calculated by correlation analysis between daily maximum discharge and peak discharge.

Qp = 0.984 \* Qmax + 38.1

2) Figurs is ( ) are calculated by relation between peak discharge rate and catchment area.

Qp(No. 23-24) = 0.798 \* Qp(No. 2323)

Table A-2-9(b) Flood Peak Discharges

(unit: m³/sec)

:	No. 2329			No. 2325	
. Date	. Disc	charge	Date	Dis	charge
	Peak	Haximam		Peak	Maximam
1965	( 99.2)				
1966	( 123 )				
1967	( 160 )		1		
1968	( 304 )			·	
1969	( 243 )			·	
1970	( 94.0)	   *   *		<u> </u>	
1971	( 106 )			]	
1972	( 112 )				
1973	( 132 )				
1974	( 149 )		22 Aug 1974	94.5	36.5
1975	(64.3)		19 Jun 1975	130	45.8
1976	( 146 )		29 Apr 1976	146	110
1977	( 142 )		1 Hay 1977	157	114
1978	( 190 )		6 Hay 1978	140	105
1979	( 148 )	* * * * * * * * * * * * * * * * * * * *	4 Jul 1979	134	23.1
1980	( 169 )		11 Apr 1980	148	123
1981	( 126 )		10 Apr 1981	27. 7	27.1
27 Apr 1982	* 129	104	23 Apr 1982	31.2	28.1
16 Hay 1983	70.6	62.0	12 Jun 1983	37.3	19.1
20 Hay 1984	309	259	20 May 1984	162	143
23 Apr 1985	174	136	15 Apr 1985	69.1	60.2
16 Apr 1986	149	113	15 Apr 1986	45. 1	34.0
1 May 1987	250	223	7. May 1987	196	172
21 Hay 1988	* 268	227	19 Hay 1988	* 68.8	53.7
15 Apr 1989	* 104	82.5	13 Apr 1989	<b>*</b> 42.0	30.8
28 Apr 1990 .	* 268	227		,	

Note; 1) Figurs with \* are calculated by correlation analysis between daily maximum discharge and peak discharge.

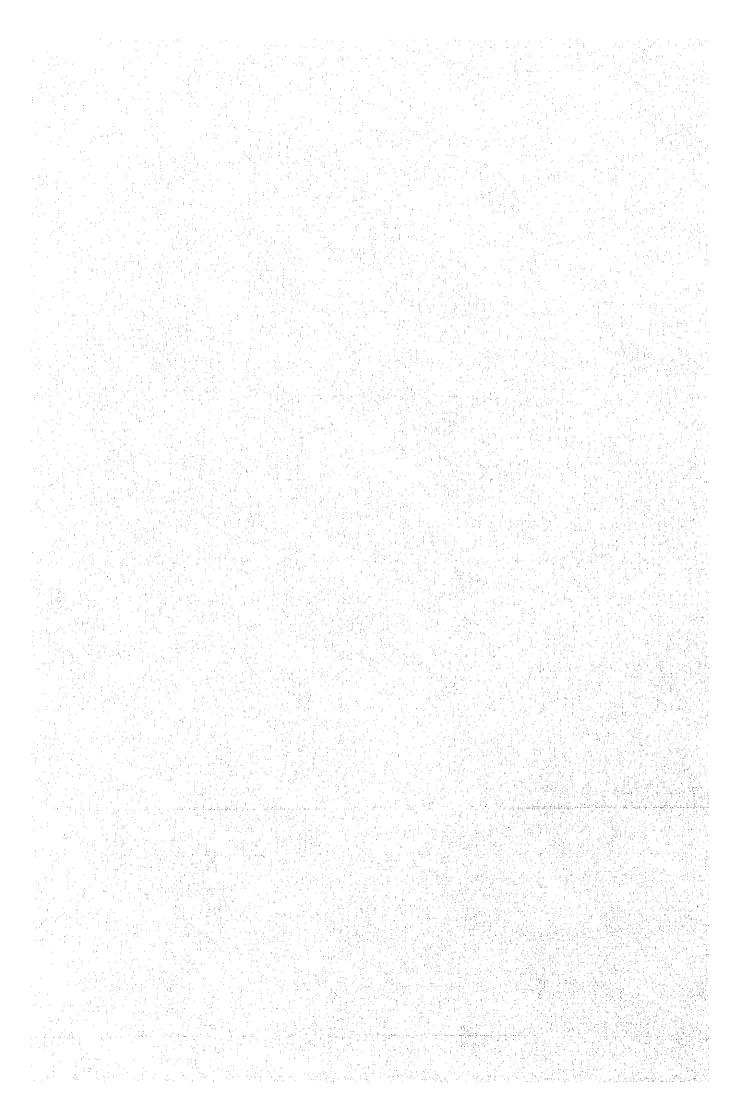
(No. 2329) Qp = 1.131 \* Qmax + 11.13

(No.2325) Qp = 1.168 \* Qmax + 6.04

2) Figurs is ( ) are calculated by relation between peak discharge rate and catchment area.

Qp(No.2329) = 0.644 \* Qp(No.2323)

A-3 Geology and Construction Materials				
	<b>)</b>			
	<b>A3</b>	Geology and Con	struction Materia	ls
클립트로 인공학 하는 100kg 등 등로 150kg 이 시간으로 즐겁는 것들고 하는 것들고 있는 것은 이 생생한다는 지난 것으로 보고 있는 것으로 보고 있는 것이다. 그런 그 것으로 보고 있는 것 				
고면 사람들은 살아보는 이 이 전문에 가장하는 것이다. 이 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은				일본 10년 1일



#### APPENDIX-3 GEOLOGY

#### Contents

		Page
A-3-1	Geologic Log of Drill Hole	AP-3-1
A-3-2	Photograph of Drilled Core	AP-3-122
A-3-3	Micrograph and Petrographic Description of	
	Rock	AP-3-141
A-3-4	Geophysical Prospecting Data	AP-3-144

01	UR	PROJ	ECT_				· .			NOLL:	No.	·	SK	-214			( 5	HEE	<u> 101</u>	5)
LOCATIO	X .	· DÁM	SITE	(RIVER	BED)	<u> </u>	<u>.</u>		DI	EPTH OF HOLE 99.50		Ø	. (	COMMENCE	) ÷	90	-08-	21		
ELEVATI	ON	102	5.08			:		<u>_</u>	DI	IRECTION OF HOLE 90°			. (	COMPLETE	) _	<u>90</u>	-10-	24		
COORDIN	IATE	X:4	51191	8.62					CC	ORE RECOVERY		%	. 1	DRILLED I	3Y _	Ka	ya-C	elil	{	
		Y:5	15742	. 32	·	:			DI	RILLING MACHINE			1	LOGGED B	Υ_	1.	vard	lal		· 
Z		ų.		≿					BSE	RVATION OF CORE		Ť	EST	NO	ų.		S S	ä_		
ELEVATION	DEPTH	ROCK NAME	5 O J	CORE RECOVERY	COLOR	WEATHER	HARD- NESS	CRACK	ROCK EVALUATION	DESCRIPTION	LUGEON	Ршах	ЬС	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.₩.L (Dpt.H)	DEPTH
1025.08	Om		°o. 0.	0 → 100 <sub>%</sub>					_	and the same of th	-	Kgf	/cm					%		Om
1025.08	2 3 4 6 6 7 7 (a.g. a.g. a.g. a.g. a.g. a.g. a.g. a.g		૱ઌૢ૽ૺ૱ઌૢ૽૽૱ઌૢ૽૽ૺ૱ઌૢ૽૽૱ઌૢ૽૽૱ઌ૽૽૱ઌ૽૽૱ઌ૽૱ઌ૱ઌ૱ઌ૱ઌ૱ઌ૱ ૱ઌ૽ૺૺૺૺૺઌૺૺૺૺૺૺૺૺૺૺ							Open Excavation: silty, fine sund with plant roots  Cobbles and gravels:  Gravel: 80%  Cobble: 20%  Max.cobble size:i3cm  Cobbles and gravels are originated from granite, dacite, granodiorite, basalt, diabase, and limestone. Gravels are rounded and subrounded; pinkish brown, grey, greenish grey. Grey is predominant among the other colours.									2.00m	1 2 3 4 5 6 7 8
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ELEVATI			5.08		····	<u>.</u>	0	1		RECTION OF HOLE 90°				COMPLETE	)	90-	10-	24		
COORDIN	NATE .									ORE RECOVERY		å A	- '	DRILLED I	34	Kay	<u> a-C</u>	eli	<u>k</u>	·
		Y:5	15742	.32						RILLING MACHINE	<u>:</u>		-	LOGGED BY	<i>!</i> _	1.1	/ard	a l	<u> </u>	
Š	200	P.W.E.	LO		-	ائد		1	OBSE I ≇	RVATION OF CORE	-	T	EST	ING	PE	9	TION	WATER		_
ELEVATION	DEPTH	ROCK NAME	L 0 (	CORE	COLOR	WEATHER- ING	HARD- NESS	CRACK	ROCK EVALUATIO	DESCRIPTION	LUGEON	Pmax	O.	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WA	G.W.L (Dpt.H)	ОЕРТН
985.08	40m		"0. O.	0 → 100 <sub>9</sub>	<b>1</b>	ļ						Kgi	/cni					%		40m
B(1). (10)		Į.	0 6 5 G							Silty,sandy gravel :										
	1 =	Deposit	0 3 88°																	1
		1	0.00		•					Silt-sand : 20-25% Gravel : 80%										
	2	Alluvial	0 0																	2
	3	1101	0,00													j				3
	-	. 4	5000 0000 0000 0000								'	'								
	4		+																	4
			+																	
	5	1 -			· c	3		4		Fractured zone, oxidized (brown) joint surfaces.										- 6
	6.				brown	5		 		alteration in minerals is not distinct.					.	]				6
					6 I		3													, ,
	7	. :.	+		Pinkish	4		3			Lu=32					ļ			;	7
			+		α			4			-									i i
:	8		+	扨				2			-									8
	9		+			3		8-3			Lu=7									9
		·	+								3		ĺ							
	50	7	+					2			-								Ì	50
	بالنا	· ,	+					_						·						and a
	. 1	rphyry									Luz8									1
	2	Por																		
	- 1	1 te	+					1								}				2
	3	Granite	+							Several feather joints, fresh joint surfaces,	Luci	10			·	Ì				3
	1		+ {		\$			1		fresh joint surfaces, occasional catolte and clay infillings.	H						I	•		بطائمت
	4		+		grey					Gray Hillings,	<u> </u>									4
l	1		+ {		Pinkish	2	2				ပူ						Į	Į		1
	5		+		P1n		1.				Lu=6			٠.						5
	 6 -}		+				pl 1	1												6
	1						1								•		Ì			
	7							,			Lu=8	: .			.					7
	1		+ 8					2					.		1					
	8		+																	8
	9		+ {						.		Lu=17		.				۱ .			-9
	1	1.5	+ 8			3.5					3									
965.08	во 1				<u> </u>			3		> driller's note ∢	Ш						_	l		60
			ļ		1	- [		(hard)		, 2 isubsticki, 3 ipiecei, 4 ilraqmenti, 5 igram ft)					LC YOU				) LOPMENT	00 170

01.	UR	PROJI	CT_							HOLE	<u> No</u>		SK	-214			15	HEE	<u>' 1 01</u>	5)
LOCATIO	Y	DAM	SITE	(RIVER	BED)				DE	PTH OF HOLE 99.50		<u>m</u>	- 1	COMMENCE	D _	90	-08-	21		
ELEVATIO	ON _	1025	.08				a		DI	RECTION OF HOLE 90°			. (	COMPLETE	D _	90	-10-	24		<u>.</u>
COORDIN	ATE	X:45	1191					_	CC	RE RECOVERY		X	_ ;	DRILLED	BY _	Kay	<u>ya-(</u>	elil	ζ	
		Y:5	5742	.32					DR	ILLING MACHINE				LOGGED B	Y _	I.	Varo	lal_		
2		Ψį		>			- 1	. 0		RVATION OF CORE		Ť	EST	NG	u.		5	꼾		
ELEVATION	DEPTH	ROCK NAME	L 0 G	CORE	COLGR	WEATHER-	HARD- NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Ртах	D O	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER Return	G.W.L. (Opt.H)	ОЕРТН
	60m		:	و100 ⇔ 0								Kgi	/cm		Ţ			%		60m
965.08	. 1		+ + + + + + + + + + + + + + + + + + + +				2	3	: :	59.50-61.15: Vertical Joint with oxidized surface	Lu<1									1
	S		+ + + + + +				1	1			4									2
	3		+ + +				3	2		Several feather Joints	Lu=4									3
	2 Percent		· + +								Luci			: -						5
	6		+ + +				2	3			Lu<1									6
	7 8	Porphyry	+++++++++++++++++++++++++++++++++++++++		grey	2	3	2 1 3		Fractured zone, oxidized joint surfaces, 2mm clay infilling	Li									8
	9 -	Granite Po	+		Pinkish						Lu<1								:	9
	70 -	ជួ	+					2			□	10								70
	2		+					2.94		Occasional feather joints	Lu<1									2
	. 3 <del>-</del>		+			3 :	2	2			Lu=1.2									h(3
	4		+					3			2.0					. :				4
	5 6		+								Lu=2									6
	7		<del> </del>			2	2	3												7
	8	Оb	<u> </u>		15.13 Et. E	3	3	2 5		Fractured zone	1.2									8 9
	9 -	DЬ	1		ളാള	4					Lu=1									
945.08	80	Gp	E		<u> </u>	2	1	1~2	<u> </u>	> driller's note 4		1	<u> </u>	<u> </u>						F.80
					1	Ī	. T		(atic)   0 ~   5 (a	k), 2 (eubatiok), 3 (piece), 4 (fragment), 5 (grain)					ELECT				(ELOPMENT	CO. LID

0}	OLUR PROJECT										HOL.	<u>E No</u>		SN	-214	( SHEET			Т 5 о	f 5]			
LOCATIO	ATION <u>DAM SITE (RIVER BED)</u>												æ		COMMENCE	90	9-08	_					
ELEVATI						m DIRECTION OF HOLE 90°											90						
COORDIN	RDINATE X:4511918.62						CORE RECOVERY						% DRILLED B						Celi	<u>k</u>			
Y:515742.32								RILLING MACHINE				-	LOGGED B	Y	I.Vardal								
ELEVATION	Œ	RDCK NAME	(5	u a a	-	o':	0	 	OBSI	ERVATION OF CORE		-	T	EST	ING	7	و	CEMENTATION	N ER	6.W.L (Opt.H)	æ		
LEVA	DEPTH	L O G CORE RECOVERY					WEATHER ING HARD-			DESCRIPTION	SCRIPTION		Paax	a o	DEPTH RESULT	BIT TYPE	CASING	MENT		6 W.L (0 ot (1)	ОЕРТН		
-	80m	~		0 m 100a	1	*	=	SPA	A W		<del></del>	LUGEON	<u> </u>	/cni		-	_	9					
945.08	OUM		+	mmi	Î	+-	<del>  -</del>	<b></b>	-			-	NUI	/CIR		-		-	%		80m		
	1 -		+								: -	(3)		:						•			
. }	. ' .	G <sub>P</sub>				2	1	1		Hard, sound		Luz									E'		
Ì	2		-1-					.,													-2		
	1	Db				2 5 3	2			Oxidized Joint surface	<u>.</u>	1_			,								
	3 -		+			3	-	2				Luci									-3		
	4.7		+				1				٠						:						
	. 1	Porphyry	+					2												1	4		
	5 1	Por	4				2	3				1,41								.	-5		
	بنفيد		<u>.</u>				-					1											
	6 -	Gran1te								a de la companya de							: 1				6		
	7.3	٠	+			2	1	1				6.1											
	1	5	+							· · · · · · · · · · · · · · · · · · ·	· · ·	Lu=	:										
	8 -	Diebese	1		1							-		.							8		
1	4	<u>ā</u>	+		>			3				63	.	Ì		1	.			j	e de la constitución de la const		
	9				gray		2					Lu=2			.					i	9		
	90	.	•		1 sh		\$	2		Occasional shattered sones.			0				-				90		
	1	۸	+ }		Greenish	11	3	3								1	}		1				
	1	vryhd	+					3				[>n-]									- 1		
	, 1	Por	+											1		·					1		
	5.	100	+ 8				i	1								-					2		
	3 1	Granite	+ }					_				Luci	1				1				-3		
	1	-	+ }				2	2		Fractured zone		1					.				-		
	1		+				3	3			Ì	-			-						-4		
	P -		+						: 1			2									-5		
	1	DЪ				1						Lu=1								ļ	,		
ring as a	6 -							1			. {	{					-				-6		
	1	E	+ (								- {	ø			·			-					
	7 -	Porphyry	+ 1		ja 4.			1				1.1.1	1								7		
	8	- 1.	+							Fauthon tolet			}				1	: }	}		- B		
	1111	Granite	+			,				Fenther Joints	** **	-											
	9	ט	+									Lu=1									- 9		
925.58 925.08 1					11.1		$\dashv$	$\dashv$	+	End of the Borehole		-	-}				+	-	+				
sected Nor T	> defider's note 4  I (stick), 2 (substick), 3 (piece), 4 (fragment), 5 (great)											EPDC (#)											
			r	A KIN	cora los	. ' s 1i	l freshi	hard) -	- 5 taof scompt	Ü		-				CTRIC POWER DEVELOPMENT CO. LID.							

OLUR	OLUR PROJECT											LE No. NiA-218 (SHEET 1 of 3						3 )				
LOCATION	N DAM SITE (RIVER B					TER BED) DEPTH OF HOLE					52.65		m	. (	COMMENCE	) _	91-					
ELEVATION	ON 1026.10				m DIRECTION OF HOLE											91-						
COORDINAT	NATE X: 4511807.45											% DRILLE							····			
<u>Y:515786.68</u>													LOGGED BY I.Vardal									
₹,	H AME					la.	· 	(	BSE	RVATION OF CORE			)	ESTI	NG		9	TION	SER.		æ	
ELEVATION	DEPIH	ROCK NAME	L O G CORE RECOVERY			WEATHER	Ģ≌ SS	NO.	ĎΞ	DESCRIPTION		LUGEON	Pmex	РС	BEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER Return	G.W.L. (Opt.H)	DEPTH	
iii ii		80			COLOR	₩E	HARD	SPA	EVAL	مان المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع الم		27			(CODE)	<u>~</u>		CE				
1026.10	Om		°° 0,	0 → 100 <sub>%</sub>	<b>-</b>	┼-				Silt and fine			Kgf.	/cm					%		Om	
	4		O. 00.					Ì		containing ro	ote.	. '										
	14		ದ್ದ°00°				'													1.40m	-1	
	. 4		0.00°							1.5-21.0m Mainly \$=5-150 and \$=1-5mm co	em gravels		·							(Final)	2	
	2 - 1 1		0300 0300							and φ=1-5mm co Shape of sands angular to sui	oarse sanos. s ls bangular.							.:		!		
	3 4		300							•											-3	
	1		2, 10 C, 10						:											: 		
	4		င်္ဂို <u>၈</u> ၀																	٠.	-1	
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	8 -		0,00°		}																E-8	
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	9 1111	pos i	200°												9.20m N=7							
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	1111	uviel	0.00				-			1 .					10.60m N=21						[- -	
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	2 1		0,00												12,20m N=27						2	
	3		0°00																		3	
		٠.,	င်္ဂ ၈၀ ၀ ၈၀								4				13.60m N=25		-					
	4   3		0.00											:	16=25					<b>)</b>  -	4	
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	8		ວິກດ ຄຸດ													'					-8	
	ar i i ar		G 90																		F. 1	
	9-		00000		∥	1						1				1					E 9	
1006.10 3	20	L			<u> </u>	1	<u> </u>	L	L	<u></u>		<u> </u>	L	L	<u></u>	<u>L</u>		<u></u>			20	
1 testels, 2 testels, 3 telegral, 4 tiragmenti, 6 tyrakii 1 thard-5 testel												EF					·					
	٠.			"" ``L	core b	038				016 6086Ø					E	LECTI	RIC P	OVIE	t DEV	ELOPMENT	CO., LTD.	

0L	UR_	PROJ	ECT							• .	HOLE	E No		Ni	A-218			( 9	HEE	T 2 o	(3)
LOCATIO	N	DAM	SITE	(RI	VER	BED)		. شدک الاستون		DE	EPTH OF HOLE 52,65		M		COMMENCE	)	91	-07-	11		
ELEVATI	ON	102	6.10						1	DI	RECTION OF HOLE 90'				COMPLETEI	) _	91	<u>-09</u> -	02		
COORDIN	IATE.	X:4	51180	7.45				<u>:</u>	<del></del> -		DRE RECOVERY				DRILLED I	BY _	<u>M</u> .(	Celi	k		
		Y:5	15786	. 68	<u>.</u>					DF	RILLING MACHINE				logged b	Y _	<u>I.</u>				
3	-	ME	G		λ			 	(	BSE 8	RVATION OF CORE	-	T	EST	ING	ם	S	TION	E LE		_
ELEVATION	DEPTH	ROCK NAME	L 0	CORE	RECOVE	COLOR	WEATHER- ING	HARD- NESS	SPACING	ROCK EVALUATIO	DESCRIPTION	LUGEON	ртах	o d	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRICL WA	<u>G.W.L</u> (Opt.H)	DEPTH
1006,10	20m		°0, 0,	0 -> 1	00% 1711								Kgf	/cm					%		20m
1006.10	, inte		0 2 2 2																		
	ا المسطورة . ورزاديسطورية	<b>3</b>	0000			. · · · · · · · · · · · · · · · · · · ·			,		21.0-21.45 Mainly fine send containing 10% gravel N=27				21.00m №27						
·	3 	al Deposi	00000						:		Mainly Course sand $(\phi=1-5mm)$ containing time sand and gravels $(\phi=1-3cm)$ 24.0-24.46m N=42										2 1 3
	,	a. V.	0000			1 m	1.														
	4.	Ailuvi	2000								Coarse sand and gravels,				24 <u>,00</u> m N≕42						-4
	n Tu		C .000								N= Same to 1.5-21.0m										
	2 1	. :	0 300						i.		e e e e e e e e e e e e e e e e e e e										5
	1	<del></del>	00.0				-	-			Slime and Fragments	}						1.			
	6-1	÷ .							4												E 6
	7							·			Mainly sharp edged										7
	ra meta		-						3		fragments										
	8 1					,		3	4			ļ Ī								1.5	8
	r bra					gr.															
	9					18h					3-5cm fragments only										F9
	, Little	4				Š	3		4												30
	30 -					O Br							:								E
	1					Ę		3	3		Mainly 5-10cm Core										£,
	. Alter					Brow		3			Mainly Fragments and										
	2	O)							4		some pieces. Rock is hard but cracky. Crack surface are brown,										2
	عبالفية	114	L					3									,				
	3	Rhyol1te		1					3												E 3
	4																				E .
	,						_				llard substick core, but									1	
	5 -			捌							crack surface is oxidated and brown.										5
							2		2		36.0-37.0m, Cracky C=3-4										
	6	٠.٠.		M		Grey	1	2	3												6
	The		L				3		3											-	- - -
	7																				7
	8 T	** 				-	-				Mitaly Vantiant and										E 8
	ا ماستاران										Mainly Vertical and cross joints Crack surface is strongly						1				Ė
	9 ]				$\parallel \parallel$		3	3	1	"	weatherd, brownish.									1	E 8
		١	-				a 1 4 24							1							
986.10	_10_3	<del></del>		ШЦ М	ΥV mi	<u> </u>	1	<u> </u>	+	festat.	p driller's note 4 1). 2 (substick). 3 (piece). 4 (frequent). 6 (grant		<b>.</b>	<del></del>	<u> </u>	= F	<u> </u>			В	<u> </u>
		: -		1	12	- core lo:	 		Chard	}~5.( <b>a</b>			:		_					& ELOPMENT	CO., LTD.

					. ,	^> ET	·\	ı (	) (2	10	LOG OF DRILL	шc	\ i	<del></del>			Ρź	ıge	3		
						ac	.O	L., \	<i>)</i> (2	HO					. '010						
		PROJE		/010	en t	nen i				ne	HOLI PTH OF HOLE 52.65	5 NO			A-218 COMMENCED			<u> 1 5</u> -07-	HEET	3 01	3)
LOCATIO	_	1020		<u>(RIV</u>	CA C	กะกา					RECTION OF HOLE 90°		0		COMPLETED	_		-09-		<del></del>	
COORDIA	_										RE RECOVERY		%		DRILLED B						
	*****			.68							ILLING MACHINE			_	LOGGED BY	_	Ι,Ι	-			
<b>z</b>		퓢		>	. [					DBSE	RVATION OF CORE		Ţ	EST	NG	ш П	,,	ě	<u>س</u> ے		
ELEVATION	DEPTH	ROCK NAME	507	CORE		COLOR	WEATHER-	HARD- NESS	SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Рпах		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	క	G.₩.L (0pt.H)	ОЕРТН
986.10	40m		1	0 -> 100	\\ 1111-				· -			<del> </del> —	Kgf	/caf					%		40m
	1 - 1		i.			Ą	3	3	3												2
	3 4	Rhyollte				r to dark gres	0-4	3 4	3 1		Fragments only  5cm core and fragments										3
	و و و بلیسیلیسیلی		L			Grey	3	3	4		Mainly Fragments and some pieces of core. Crack surfaces are sharp but weathered(brown) 45.0-45.9m Granite Porphyry										5
	2 de 1		+					2	3												7
	8 8 9	Porphyry	+ + + •			۸	8	3	3		Somewhat cracky, but fracture surfaces are fresh, 48,9-49.0m,sheared zone,										9
	50	Granite P	+ + + +			Ore	2	2	2		Fresh and hard, stick core.										50 1
973.45	3		+								End of the Borehote				i						3 S
	3 4 4																				3 10 10 10 10 10 10 10 10 10 10 10 10 10
	9 G																				5 5 6
	7																		as .		7
	8 9																				8
986.10	_60											<u> </u>		L		<u></u>	<u>L</u> _	L			60
					N.	ore los	•	(free)	l Guard	9-5(c	> dr≅er's note ∢ (; 2isabstick), 3 ipiace), 4 tiraqenenti, 6 igrasu oposedi posedi								T DEV	D ELOPMENT	CO., LYD.

**Page** 

OLUR	PRO.	JECT_				····-			HOLE				-219	····		( 5	HEE	101	4)
LOCATION	DAY	SITE	(RIVE	R BED	L				EPTH OF HOLE 62.00				COMMENCE	) _	91.	-11-	01_	<del></del>	
	102								RECTION OF HOLE 90°				COMPLETE	)	91	12-	30		
COORDINATE	<u>X:4</u>	151199	7.36						ORE RECOVERY			. ;	DRILLED I	3Y	у,	Celi	k_		
	<u>Y:</u> 5	515737	.56	<del></del>				DF	RILLING MACHINE				LOGGED B	Ι_	1.	'arc	la l	· · · · · · · · · · · · · · · · · · ·	
2	Ω.		.≿					BSE	RVATION OF CORE		Ţ	EST	NG	Ä	6	TION	Z.E.		
ELEVATION DEPTH	ROCK NAME	7 0 0	CORE RECOVERY	COLOR	WEATHER-	HARD- NESS	CRACK	ROCK EVALUATION	DESCRIPTION	LUGEON	Ртвх	Pc	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WAT	6.W.L (Opt.H)	ОЕРТН
01	11	° 0.	0 => 100 <sub>9</sub>	ř	_				0.0.40.0.411		Kgf	/cm				اء ,	%		Om
01 1025.48 1 2 3 4 5 6 7 8 8 9 10	nathan da an d Deposit	6. 18. 18. 18. 18. 18. 18. 18. 18. 18. 18	O → 100 <sub>2</sub>						0.0-43.0 Alluvium  0.0-1.5 Open exervation Silty sand  Silty sandy gravel: Silt-sand: 15-20% Gravel: 80% Gravel: 80% Gravel: 80% Gravel: 80% Gravel: 80% Gravel: 80% from granite, diabase, rhyolito and limestone. Fine particles are washed away. 10cm block (granito) is encountered between 3.0-4.5m.  Rhyolite block Silty, sandy gravel: Silt-sand: 15% Gravel: 85% Characteristics of gravel are as it is mentioned above. Fine particles are completery washed away.  Silty, sandy gravel: Silt-sand: 20-25% Gravel: 75-90% Characteristics of gravel are as it is mentioned above. Fine particles are washed away.		Kgf		9.20m N=43 11.60m N>50	ф86mm	Φ4			1.80m \$ (Firm)	1
8	والمرافقية والمورانات	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0																	8
1005.48 20	1	0 0								L			L	L	L	L		L	20
			N K	1	1	1			> driller's note 4 (i. 2 (substicki, 3 (piscel, 4 (frequent), 5 (grain)			. :	E	Z F	)[	)C	# (#	₽	
			IZA N	-care lo 	P 9	l (fres	(Nard N-5(	) - 5 (a decom	ofti ponedi									ELOPMENT	CO., LTD.

0L	UR .	PROJ						· 		·		E No			-219			_[	SHEE	T 20	f 4)
LOCATIO	N _	DAM	SITE	(RIVE	r BED	)			D	EPTH OF HOLE	62.00		M		COMMENCE	D	91	-11	-01	`	
ELEVATIO	ON L		5.48							IRECTION OF HOLE					COMPLETE	D	91	-12	-30		
COORDINA	ATE	X:4	51199						C	ORE RECOVERY			7/	-	DRILLED	-					
	-		15737							RILLING MACHINE					LOGGED B	_		Vare			. <del></del> .
<u> </u>	<u> </u>				T			<del></del>		ERVATION OF CORE		T		- EST		1 -	<u>·</u> ·				r
ELEVATION	DEPTH	ROCK NAME	L 0 G	CORE	COLOR	WEATHER-	HARD- NESS	SE SE	Ž		PTION	LUGEON	7	0	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	ОЕРТН
	20m			0 → 100 <sub>9</sub>							~~~~~		Kgi	/cnt	-		_		%		20m
	$\frac{20}{1}$	Alluvial Deposit	ార్వించినికి స్థాన్నికి మీదిని సినికి	O → 100 <sub>9</sub>						Clayey, sitty gravel: Graven mostly fine is cocasionally gravels are contains less of clay. Fine materical Gravel gravels are gravels are ein place.  Silty sandy gravels are gravels are cin place.  Fine materia Gravel Gravel gravels are gravel gravels are gravels are gravels are gravels are gravels are gravels are gravels are all gravels are all encountered in size occasionally gravels are all encountered in gravels are gr	els are n size; medium ncountered. t of fine washed material percentage al: 65% : 35%  ravel: cnerally un in size; f coarse ncountered al: 25% : 75%  block 33.45m ravel: al: 40-45% : 50-55% cnerally ;2-3cm lso		kgı		24.10m N=20 25.10m N=37 27.10m N=30	φθθmm	. 70				20m 2 3 4 5 6 7 8 9 7 8
985 48 4	10 1	0	300							Fine materis Gravel	11: 25% : 75%						ļ				-
		le	ľ	7.70		1	1	† <sub>10</sub>		oriilor's hote e 2 (substick), 3 (place), 4 (frac	ement). 6 loveini	اسبا		L	E				   45		40
	. 12.2			a KA	core loss	i . 101		herd)	-5 (so	ti	u tgi biili			:						LOPMENT (	.O., LTD.

0!	UR	PROJ	ECT							KOL	E No	<u>`</u>	Ni	-219			( 5	HEE	r 3 of	4)
LOCATIO	ON	DAM	SITE	(RIVER	BED	)			DF	PTH OF HOLE 62.00		m	-	COMMENCE	D _	91	-11-	01_	<del> </del>	
ELEVAT	10N	102	5.48					1	DÌ	RECTION OF HOLE 90°		·	•	COMPLETE	D _	91	-12-	30		
COORDII	VATE .	X:4	<u>51199</u>	7,36						re recovery		%	-	DRILLED I	-		Celi		· · · · · · · · · · · · · · · · · · ·	
		Y:5	15737	.56						ILLING MACHINE	<u> </u>			LOGGED B	Υ		Varo			
<u>3</u>	30	3	G	<del>}</del>		là.	T	·	جنب	RVATION OF CORE		1	EST	ING	ų,	ç	TION	E.X.	·	±
ELEVATION	DEPTH	ROCK NAME	L 0	CORE RECOVERY	COLOR	WEATHER-	HARD- NESS	SPACIN	LIATION	DESCRIPTION	NOBBIT	Pmax	20	BEPTH	BIT TYPE	CASIMG	CEMENTATION	DRILL WATER	(H.#.D)	DEPTH
<u> </u>						2	T.	88	EVA		13	<u></u>	_				90			
985.48	40m		00. D	0 \$ 100%	-	<del> </del>		-			┼-	KST	/em					%		40m
		Deposit	0,00																	
	1 -	Der	0.00°			: :										8				1
	2	isi	0°00							Silty, sandy fravel Gravels are fine and medium in elze and originated from granite. Pines are washed away. Pine material: 15% Granite : 75%							1			-2
		Alluvi	000°							Fines are washed away. Fine material: 15% Granite : 75%										
	3 -	4	**************************************	73		-		-	:"						1 1		Apr.			-3
	-							2		43.0-62.0m Granite All joint surfaces are									ļ	.
	4		+					١		oxidized ; 1-2mm clay- quartzite infillings;										-4
			+				2	3		thin quartzite veins.										-6
}	5		+			3										ı				•
	6 -		+					3							1					-6
			+				3	4		Fractured zone										
	7		+												.	·				7
	-									Many quartzite veins be- tween 47.4-58.35m; these joints are the cause of a									-	
	8 -						2	3		joints are the cause of a fracture zone. Joints have rough surfaces and are			. 1		.					-8
	9-	:	+							filled with 1-2mm quartzite or clay.						i			1	9
			+							48.25-48.95: Vertical joint						-				
	50		+					.3 (,)		Fractured zone					8 6mm					50
		orphyry	+		<u> </u>	) 	1 :	2							8		Ċ		2.00m (50.50m)	E .
	t -	orp	+	41	100			3									İ			<u> </u>
		С			t ish		3	3												S
	2 -	Granite			Š.			,		Fractured Zone										
	3	ម៉	+					4												3
	-		+			2		_								: .				
	4	* 1	+	70			2 { 3	2					:	] }						4
			+	WW			-	-						1.1						
	5		+				3	3		Fractured zone				5.1						5
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	6												:			i				
	7		+				1	5	•											7
			+		¢.		s	2								i				
}	8		+				2	3	), i.						} }					8
			+					2						]						
	9		+			2		2		A few oxidized joint sur- faces										9
965,48	60				<u> </u>	3	1	3					L.							60
							Ť	Iomardi		» driger's note « , 2 (audietick), 3 (pleas), 4 (fragment), 5 (grain) //i										· .
			1	\ \\	r Cere ion	19 1	i tiresi	1713-7-0  )~15 te	~0 (#) MODEN	ru caedi		٠.		EL	ECTR	IC PI	OWER	DEV	ELOPMENT	CO., LTD.

<u>OLU</u>		PROJI		<u> </u>							HOLE	E No			-219	<del></del> .			HEE	4 01	4)
LOCATION	_	DAY	SITE	(RIVE						and the second second	62.00		æ	'	CÓMMENCE	D _	91-	11-	01_	<del> </del>	
ELEVATIO	N _	102	5.48				g	1	, DI	IRECTION OF HOLE	30,			-	COMPLETE	D _	91-	12-	<u> 30</u>		
COORDINA	TE	X:4	51199	7.36			_ :		CC	ORE RECOVERY			%_	_	DRILLED	BY _	у.С	eli	<u>k</u>		
	. · · · <u>.</u>	Y:5.	15737	.56			<u>:</u>	۰	DF	RILLING MACHINE	<u> </u>	<u> </u>			LOCCED B	Y _	1.1	ard	al		
z		Ų.		٠.	T				1280	ERVATION OF CORE				EST	NG	L		Š	<b></b>		
ELEVATION	DEPTH	ROCK NAME	L 0 G	CORE		WEATHER-	HARD- NESS	CRACK	ROCK EVALUATION	DESCRI	PTION	LUGEON	<u> </u>		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION		G.W.L (Opt.H)	DEPTH
965.48	50m			0 + 100			L.			ļ		-	Kgi	f/cnf					%		60m
963.48		Gр	+ + + + +		Whitish grey	2 5	1	3		Very hard and						φ.8 Smm					
	3 4									End of the ba	rchole										3
	6 6 باستواسطیسیاسیاس																				5 5
	s s utimbutuiti																				7 8 9
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	6																				7 (1)
	8 Լոոդարեուկումել																				8 9 بىلىسلىنىداسىرلىيى
945.48 8	<u>во Т</u>	<del></del>	<u> </u>	ЩШ	Ш	1 :	L_		<u></u>	» driller's note <	·		ـــا	<u>L.</u>	<u> </u>	1_:	L		L	L	F 80
	; ·	٠.			N	1		l thard	0 - 5 (s	ki, 2 isubatitaki, 3 ipiecel. 4 ili	aqmenti. 6 igreini						RIC PO			<del>)</del> ELOPMENT	CO., LTB

OLI	UR	PROJI	ECT					•			HOLE	No.	·	SK-	210			( 5	HEE	1 06	7)
LOCATIO:	N	DAM	SITE	(LEFT	BANK)			<u> </u>	DF	OPTH OF HOLE	127.00		m_	. (	COMMENC	ED	_90	-06-	05		
ELEVATIO	0N = _	108	5.22	<u></u>			Ш	1		RECTION OF HOLE					COMPLET			-			
COORDIN	ATE _														DRILLED						
<u>,</u>		Y:51	15613	.04						RILLING MACHINE					LOGGED	BY	1.	Vard			
Ω	<u>.</u>	AME	5	E E	-	de l	S	ا ن	)BSE	RVATION OF CORE		z		EST	NG	TYPE	5	CEMENTATION	DRILL WATER RETURN		ਣ
ELEVATION	DEPTH	ROCK NAME	r 0	CORE RECOVERY	COLOR	WEATHER- Ing	HARD- Nes	ACK	쯨	DESCRIP	PTION	LUGEON	Pmax	٦ د	DEPTH RESUL	BIT T	CASING	MEN	RETL	G.W.L (Opt.H)	DEPTH
W :		₹		0 ⇒ 100%		*	<del>2</del>	SPA	EVAL					/cm			╁	빙	۵ %		Ont
1085.22	Om		Τ,		tr	5	5	5		Strongly weat	hered		ligi	70		+	一				9,111
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	2						3	·4							٠.						2
	1		_ <b></b>										:								
	3		_L_																		-3
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	4 -		1										l .								
	5		T			3		3								-					5
	-		1			3				Crack surface	is oxidized										
	. 6	.					3	١, ١			,										6
	1							4													7
	7	<b>0</b>			r .																
	8	Отаряяе	_		Green					E. C. HA						-			,		8
·	الباليا	Ö	1		Dark		2	3				ſΩ								. •	Ē.
	9		J		å		3	3				1,u=35	2								9
	النفير		1			-	2	4													E 10
	10		T				3	3												4	
	1	*     .	1_							Crack surface	is oxidized	Luz9	0,1				1				
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	2											-									-2
	 	[ · · . '	1			.3		2				8 3			1		}			:	-3
	3 1		-				2	3				Lu=28	-				'				٠
	4						1	1		Empression		_	<u> </u>	-							1
			1				3	-		Fragments		7									1
Party.	5		T					2				Lu=24	2								5.
	4	<u> </u>			<b>0</b>	3	3	4		Cracky along	the contact	្តី គឺ	1								
	6	4			Wh 1 c			-				7								, i	6
	7 -	Rhyol1te			- cs	2	2	2		17.00-17.25m	Cracky		0								7
		R <sub>2</sub>	L		Pinkish White	3	3	3				Lu=40									i. Li
	8				ρ.	-	ļ	-				-	╁-	1							8
		986				2	2	2		18.40-18.70m	Cracky	0									the contract of
	9	Diabase				3	3	3	1			Lu=40	Ĭ					:			9
1065.22	20	Δ				L	Ĺ						L		L			L		<u></u>	20
	: : :	, S	• :		3	1	Ī	l Grand		> driller's note ∢ k). 2 (substick). 3 (piece). 4 (fra soft)	aqmenti. 5 (grain)						וכ				:
		- : : '			— ROD	188	l (fres	พ-6	lorson	त्रक्रकत्त्री व्यक्त						ELEC	TRIC I	YOWE	K DE/	ELOPMENT	CO., LTD.

0L	UR_	PROJ	ECT_							HOL	E No		SK	-210			13	SHEE	Γ 2 ο	f 7)
LOCATIO			T.	(LEFT						PTH OF HOLE <u>127.00</u>			_	COMMENCE						
ELEVATI									100	RECTION OF HOLE 90°				COMPLETE	•					
COORDIN	ATE					•				ORE RECOVERY				DRILLED .					<del></del>	
<del></del>		·	15613	1						TILLING MACHINE			EST	LOGGED B		<u>!.</u>	Varo			
ELEVATION	DEPTH	ROCK NAME	<b>D</b>	CORE	<u>~</u>	Ĕ.,	NESS	<del></del>	N S	RVATION OF CORE	35	T.	Γ	DEPTH	BIT TYPE	CASING	CEMENTATION	WATER	G.W.L (Dpt.H)	DEPTH
ELE	띰	80 X3	د	2 2	COLOR	WEATHER- ING	HARD	SPAC	VALUE	DESCRIPTION	LUGEON	Pmax	Po	RESULT	먪	Š	CEME	DRIL	(Dpt.H)	8
1065.22	20m			0 -> 100%								Kg	/cnf					%		20m
SS. 6001	erdetus		1		Grey	2 1 3	3	2 1 3						Ì						
	1 -		L				2 3	2			Tu=40	0.5		ľ		·				<u> </u>
	jraj	Diabase	-L		Green		3	4		Shear zone (20deg)				·					·	
	S Junet	Dia	T		1	3	2	2		Vertical Joint	w									2
	3 -		1		Brownish		1	1		ver estair bostic	=43	80								3
	India				ų		3	3			3		İ							
	7 4		L_														1			-4
	5 7		Ļ				1				10.75	α)								5
	41.61.4		i_								13									
	6		L.							Crack surface is oxidized	-	<u> </u>								6
	<b>3</b>		L			1					113	0								7
			L					ľ			Lual	1							:	
	8 7		L		1						-	ļ		-						8
	, L.L.,	Ø			Grey	s					38									t.  -  -
	9 -	Rhyolfte	L					٠		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Lu=38	10								<u>.</u> 9
	.30	. Rhy			Light	2	2													E 30
	11/11					-					107									-
	1		-~					}			Lu=4	10								1
	, 1		. —					2			L									-  -  -2
	 		L.				] :				15									, E
	3 1		<u> </u>								140	က								<u> </u>
	بالغر	: .	L					2		33.80-34.20 diabase (30deg)	17									عدياء
	4 1		L			3	2	3												E 4
	5		1		ļ		-	2			u=33	0.7							:	5
	بسيانه		1					3			3			}						E E
	6						2	4		Cracky zone	-									6
	, 1	ø	1		uee			2				,								E 7
	Line	Diabes	4		Gre	3	_			39.0-39.4m Cracky zone Crack surface is strongly		1								E.
	8	ដី ,	T		Dark					oxidized. Many vertical Joints	-	-		1 .						8
	11		Ţ				3	3			4.					. :				<u></u>
	9 1		L								Lu=4	10								[-9 [-
1015,22	40		T	MIIII	<u> </u>			<u> </u>									<u> </u>			40
			:			Î	. [		latick	> driller's note < i. Zisubaticki. 8 (pleas). 4 (is eqment). 6 (grain) orti	· • .			<u> </u>					D DOMESTING	

0	LUR	PROJ	ECT							· · · · · · · · · · · · · · · · · · ·		HOLE	No		SK	-210				HEE'	<u> 3 o</u> i	<u>7</u>
LOCATI	ON ,	DAM	SITE	LEFT	BANK)	)			, Di	EPTH OF HOLE	127.00			m		COMMENCE	D _	90	-06-	05		· · · · · · · · · · · · · · · · · · ·
ELEVAT	ION .	108	5.22	<u> </u>	·. · · ·	·	I	0	D.	IRECTION OF HOLE	<u> 90</u> °				. (	COMPLETE	D	90	-10-	04		
COORDI	NATE	X:4	51187	9.04					C	ORE RECOVERY	<u>:</u>			%	.	DRILLED	BY _	N.	Caki	r		
		Y:5	15613	3.04	<u> </u>				DI	RILLING MACHINE						LOGGED B	Y _	I.	Vard	lal		. ·
₹		WE		≵		T	Ι			ERVATION OF CORE	· · · · · · · · · · · · · · · · · · ·			T	EST	ING	Щ	¢5	TION	NER N	······································	
ELEVATION	DEPTH	ROCK NAME	20.3	CORE RECOVERY	COLOR	WEATHER- ING	D-NESS	S S S S	ROCK EVALUATION	DESCRI	PYION		LUGEON	Ртах	ا <b>ا</b>	DEP1H RESULT	BIT TYPE	CASING	CEMENTATION	ETUR ETUR	G.W.L (Dpt.H)	DEPTH
4	0	80.		1		WE.	HARD- NESS	50	EVAR			:	ñ			RESULT	m	٥	¥3	DR: PR:	(Dpt.H)	
1045.22	40m			0 → 100°										Kgf	/cal					%		40m
			İŤ			3	3	3					ო									
	1 -		1	<b>M</b> III				3		:			Lu=1.	01								<u> </u>
			Т							·		1	ដ									
	2 -		1																			- 8
	3 -		1					2					Lu=3	1.0								-3
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. [	6 ~		1					5	. :		•											6
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			-		. :						1 <u>1</u> 2.555.35		6									
	9		1		Ę					48.80-49.00m	Fragment	s	Lu=3	10								- a
	7	ase	1		Green		2	2														_
	50-	Dlabase	1		Dark (	, ,																E 50
	To I		Τ		Ω						1		Lu<;	10								Ę.,
	1		Τ				-	_		Cracky			គ									
	2 -		1				2 3	2 3			*											2
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	3.7							2					Luci	10						i		3
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.			J.		*			2	. :			ļ									1	
	5		T					s				.	Lu<1	10	Į							5
	1							3		56.00-56.20m	Fragment		-1									
	6					1	2					}									·	-6
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	7 -		ا جات					1		Crack surface oxidized.	is sligh	Lly	Lu<1	10	.							7
	8		1				54 61,4						_	1.	}							- g
1	,		L					,				. 1				:					58.80m	
a' > }	9				- 11			2			: •		Lu<1	10						· 1	(Final)	9
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1052 53	<u>60 -</u>						 	1	لــــــا 	e driller's poles	amount is to the		l	i						ام (		E 60
are al		11	41.3	M N	1.75	٦ij.	1.		(e)ick I~B (su	i. 2 feriósticki, Stolecol. 4 lift Mil	desident o (design)					1		~ <u> </u>	l land	191	<del> </del>	

LOCATIO	LUR	PROJ		LEFT	BANK		<del></del>			SPTH OF HOLE 127,00		M		-210 COMMENCE	<u></u>	90.	1 5 -06-	<u> 85</u> 85	4 91	}
ELEVAT	~	108		111111	ត់មារ			 )		RECTION OF HOLE 90°	1.	10	-	COMPLETE	_		-10-			<del></del>
COORDI				9.04						ORE RECOVERY		ey.	•	DRILLED	-					
	_		15613		:					HILLING MACHINE				LOGGED B		•	Vard			
æ				<del></del>				: (	BSE	RVATION OF CORE		7	EST	ING	ш		Š	œ.		
ELEVATION	DEPTH	ROCK NAME	(5 (2)	CORE	ĕ	HER-	ESS	¥;	CK	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER	G.W.L. (Opt.H)	рертн
EE	ă	ROCI		0 22	COLOR	WEATHER- ING	HARD- NESS	SPAC	EVAL.	DEGCRIF (IDIC	3	P.	0	RESULT	18	3	CEME	OR!	(Opt.II)	Δ
1025.22	60m			0 -> 100%								Kgf	/cm					%		60m
1023.22	1		Ì ∳ ,																	
	1 4		+					,			ruk;	10								1
			1			2	2	,												
	2-	. !	1			°.	-					-					i			2
·	3		1.					2			Luci	0								3
	1		1			1		. ·			Ā									
	4				}		2				-	-								4
	- 1		1				3	3			8									
	5	0	1		Grey		3			#	Lu=3	10								5
	6	Diabase	1							Slickenside observed on										6
	,11	ā	1		Dark	2				crack surface. Shear zone.										
	7 1		<sub>  </sub>				3	4			Lus7	10								7
	1		L			5	:													8
	8		_L_																	العادا
	9 1		1			3	2	3	: 1		ראקן	10								9
	1		1				3	4			"								;	
	70	,	1	24																70
	1		1				3	4		Shear zone Some part is silty.	Lu<1	0								
	1	<u>:</u>					1				្រ									Ė.
	2		1	77.77					2	Slime Slickenside on crack	-									2
	1		1					2.		surface, slighty oxidized	4	0								
	3		1		٠.			.4			Tu=4	-	.							=3 E F
	1				1					74.9-75.0m Small fragment	_								÷	[ -4 ]
			L i					2				·								
	5		1		ç	2	2				L L	10								5
*.	1	9886	1		Gree			3												E
	, 1	Diabas	1		Dark															
	7 -		1		Ä		·	2			£ 1	0								7
	1		T																	
	8 1		1			,	1	1			-						,			F 8
	9 7	. :	1			3	,	1.			[N<1	10								-
	5 Serveda		1			2	2	2			3									
1005.22	<u>80</u> 3	: 1			27		L			▶ driffer's nate 4	1	<u> </u>	لــا					أسا		F 80
		.*	. '	N	core los	1	)   	thard	)~6 ta	), 2 (substick), 3 (piece), 4 (frequent), 6 (grad)					LECTR				LOPMENT	CO. Lin
				<u></u>	- RQD			ا ت	veri	AP-3-16										
Term		a 1.		1 1 1			:			MI "J"IU										

OLUR	PROJ	ECT_							HOLE	No.	<u> </u>	SK	-210			1.5	HEE	T 5 of	7)																			
LOCATION	DAM	SITE	(LEFT	BANK)	)			DI	PTH OF HOLE 127.00		m	ا .	COMMENCE	)	90	-06-	05		<del> </del>																			
ELEVATION	108	5.22				I		DI	RECTION OF HOLE 90°	:		4	COMPLETE	)	90	-10-	04																					
COORDINATE	X:4	51187	9.04					CC	NE RECOVERY		%		DRILLED I	BY _	<u>N.(</u>	Cak i	r																					
4 A	<u>Y:5</u>	15613	.04			<u> </u>	· 	DF	ILLING MACHINE		:	_	LOGGED B	Υ _	[,1	vard	la l																					
Z	Ψ		≥:				(	BSE	RVATION OF CORE		T	EST	NG	ш		NO	낊																					
ELEVATION DEPTH	ROCK NAME	20	CORE RECOVERY	COLOR	WEATHER-	HARD- NESS	CRACK	ROCK EVALUATION	DESCRIPTION	LUGEON	Ртах		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Opt.H)	DEPTH																			
80n 1005.22	1		0 ** 100%								Kgi	/cm			_		%		80m																			
1		1			1	1	1 1 2		Crack surface is not oxidized (fresh). Calcite on crack surface	Lu<1	10		: : :																									
3	Diabase			Green	\$	ړ 2				Lu=4.6	10								ە 3 مىلىسىلىمىسلىمىسلىمىسلىمىسلىمىسلىمىسلىم																			
5	D18	1 1		Derk	2	3	3		Vertical Joint	Lu=2	10								. 55																			
7		1 1 1			1 5 2	1 \$ 2	2		Vortical Joint	Luci	10		, 1						- 6 - 7																			
90	Rhyo11te			Pinkish White	3	N N N N	2			Lu=4	10								8 9 9 99 مالعينيلوروالعساليتورا																			
1	Diabase	Ī L		D.gn	3	2	2			Lu<1	10								1 2																			
3		L			3	3	3 2 3			Lu<1	01								3 3 4																			
5	1150	L		kish White		3 4 4	3		BTA red color. Easily broken by finger in some part.	Lu<1	10								دى ىنىمىلىرىرىلىرىنىلىرىنى																			
7	Rhyol 1			White-Fink!	3	3	3			Lu=0	10								و مسالم سالم مسالم سالم مسالم  9	باعتيدانينانين						4		Small hard fragments	Lu<1	10								199 100 100 100
DOM. EALTOO		<del></del> -	<b>A</b> N	j	1	1	<b>†</b> .,	(atint	> 体Rer's note 4 ), 2(substick), 3 (pioce), 4 (fragment), 5 (grain)			. :		ΞF	<b>)</b>	)[	la	f)																				
			I I	  -core lo:  RQD	≹. 88 : 1		(Chard	1~5 (s										ELOPMENT	CO., LTC																			

<u>Page</u>

0	LUR	PROJI	ECT				·		<u> </u>	HOLE	E No		SK	-210			15	HEE	<u> 6 of</u>	7)
LOCATIO	ON	DAM	SITE	(LEFT	BANK	) .			DI	EPTH OF HOLE 127.00		M	. (	COMMENCE!	) _	90	-06-	05		
ELEVAT.	ION _	108	5.22	· <u></u>				<u></u>	DI	RECTION OF HOLE 90°			(	COMPLETE	) _	90	-10-	04		
COORDI	NATE	X:43	51187	9.04					CC	DRE RECOVERY		%	. !	DRILLED I	BY _	Ŋ.(	Caki	.r		
		Y:5	15613	. 04					DF	RILLING MACHINE			. 1	LOGGED B'	γ	Ι,	Vard	lal		· .
æ		쁘		>-	<u> </u>			(	BSE	RVATION OF CORE	Π	T	EST	ING			8	8	· · · · · ·	
ELEVATION	рертн	ROCK NAME	F O G	CORE	COLOR	WEATHER- ING	HARD- NESS	CRACK SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	Pmax	Pc	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Dpt.H)	ОЕРТН
	100m			0 ⇒ 100 <sub>%</sub>							<u> </u>	Kgf	/cm					%		100m
985.22	2				White		3	4			Lu=2	10								1 2
	3 (material and material	Rhyolite			White-Pinkish	3	3	1 4		HTA light grey, easily broken by finger in some place.	Lu<1	10						-		33
	4 5		L		c7W		4	Ą		Calcite vein along cracks	Lum1 2	10								5
	6 7	Diabase	1 1		Green	2	2	2		106.4-105.6m HTA Somewhat soft	Lu<1	1.0	::							7
	. 65. 89.	Dia	1 1		Dark						Lu<1	10							. :	8
	110							2		Generally, crack surface is in pinkish color	1									110
	7		L					3			Lu<1	10								5
	3 Supplied that				White	2	2	2			Lu<1	10								3
	4 Paristantian	Rhyol1te			White-Pinkish			4			Lu=1.3	01								. 55 C
	7				M.P.			2		117.6-117.8m Cracky	Lu<1	10								6 7
	8 -		L			3	3	5		irra 118.4-118.8m Diabase substic core	Lu=2 Lu<1	10							i .	
965.22	120		<u> </u>			1		(hard		» driller's note 4 d. 2 fechs Hold, Sipplece). 4 ffrequenti. Bigrafili offi	<u>  1-1</u>	I	L		ECTO				) FLODMENT	F 120

Page

OLUR	PRO.	ECT	· · · ·	· · · · · · · · · · · · · · · · · · ·	·			٠		HOLI	E No		SK	-210			L	HEE	T 7 of	7)
LOCATION	DAY	SITE	LEFT	BANK	)	-		DI	EPTH OF HOLE 127	.00		M	-	COMMENCE	Ď _	90	-06-	05		
ELEVATION	108	5.22	<u> </u>		<u>.                                    </u>	!	11		RECTION OF HOLE 90°				-	COMPLETE	0 _	90	-10-	04	· · · · · · · · · · · · · · · · · · ·	i
COORDINATI			9.04			:	-		ORE RECOVERY	* * * * * * * * * * * * * * * * * * * *		%	_	DRILLED	_					
	Y:5	<u>15613</u>	3.04						RILLING MACHINE	·				LOGGED B	Y	1.				
N N H	AME	G	ERY	+	lee.	62			RVATION OF CORE		-	T .	EST	ING	PE	5	CEMENTATION	ATER RN	G.W.L (Opt.H)	Ŧ
ELEVATION DEPTH	ROCK NAME	0 1	CORE	COLOR	WEATHER-	Š	ACK	COCK	DESCRIPTION		LUGEON	Ртвх	D O	DEPTH RESULT	BIT TYPE	CASING	MENT	RETU	G.W.L (Dot.H)	рертн
<u> </u>	_	<b></b>			3	¥	30	, W		<del></del>	=	L			CC3		E			
965.22	m	L	0 -> 100		+	-	-			·	-	Agi	/caf					%	·	120m
	1								Mainly fragmental Somewhat HTA		Lu=2	10								i l
] ] ;	Rhyolite				3	3	4		·		-	Ä								1
2	that show	i									Luss					ļ				2
1	1 ~	\ <u></u>	g	0 2							13									
3	-	<u>                                    </u>		White	-							0								3
	d d	+		1sh			4		* · · · · · · · · · · · · · · · · · · ·		10									
	qD =			Pinkish	3	3	3		٠.		Lun 5							1		-4
6	Lund			11 ***					in the second se			10				·				5
	or of the	+			з	3	3			* 4 4 4										
6	3	L				2					Lu=5.	-								6
	Ry	L			3	3	2				្រី	10					:		4. T	in land
958.22	1			$\parallel$	1-	-			End of the Borehol	Te -										7.
8	than a													1.1			٠.			8
	1					٠.,											1, 1			-
9	1					:				1										9
	1											 i								d d
130	1									• ;				· .						130
	7													l Sala Talan						
[ '																				
2	1																			-2
	4													: 		74				
3	1					7			1							1.				-3
	1									15.4										
4	1	n . 116								:										-4 -
5	1																			5
	1																	3.		
6	1																			-6
														·   •						
7	1								t daga a makan mengalan salah salah Jengga Bagai					· !						7
g	1					1.				 :		İ		: .						8
"	1																			*.
9	1																			-9
	1															:				
1.945.22 140	1_			7	1	1	L	لبا	5 differ a note of	Lineate	<u></u>	Li	L			<b></b>		اما		<u> 140</u>
				∛ core ie	' [ 83 1	i iiresi	therd	istock J-5 (no Jacom	), 2 (espeticie), 3 (piece), 4 tiragment), 5 viti xxeedi	, ਜੰਗ <b>ਹਵ</b> ਲ									) Lopment	CO,LTD
			L	-RQD					AP-3-19											÷

<u>OLUR</u>	PROJ	ECT							HOLE	<u> </u>	<u>.                                    </u>	<u>SK</u>	-212			15	HEE	r lof	8 )
LOCATION	DAM	SITI	(LEFT	BAXK	)	······································		DI	EPTH OF HOLE 160.00		ra		COMMENCE	D _	90	-10-	31		
ELEVATION	112	5.97				1	À_	Di	RECTION OF HOLE 90°		<del></del>		COMPLETE	D _	91	-03-	99		
COORDINATI	X:4	51185	6 03		:			CO	DRE RECOVERY		%		DRILLED 1	BY _	Cal	kir <u>.</u>	Cel	i	
	Y:5	15565	5.43		. :			DF	RILLING MACHINE				LOCCED B	Υ			_		
		T	1		-			OBSE	RVATION OF CORE	<u> </u>		EST	ING	T]		ĕ	œ		
ELEVATION DEPTH	ROCK NAME	2007	CORE	COLOR	WEATHER-	HARD- NESS	CRACK	ROCK EVALUATION	DESCRIPTION	LUGEON	Рпах	D O	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L (Dpt.H)	ОЕРТН
	m		0 -> 100	%	T						Kgf	/cm					%		Ont
1125.97	يوبيانية بمامييوا بميداء					1	4		Surfaces of fragments are strongly oxidized,						:				1
	1		ØIIII	Brown	4	3	2												- {
3	unifire.	     		Br		4	5		Small fragments, partially soil				·		:				3
	Lunda	1				"	1											·	
5	distant	1			-	-			6-7cm fractured zone at 6.9m (clay and breccia)						·				5
6	المتسالة	T				2	2										:		6
7	بأسبان						-												7
ε	1941	1			3														8
S	olabase	1				2	2		Generally substick core	Lu=19	10			96mm					9
10	آسانسان بلاط	1				3	3		Generally substick core	Lu=25.2	10			886					lo lo lo lo lo lo lo lo lo lo lo lo lo l
2	estreente	1		reen					Crack surfaces are oxidized (brown color)	1,7	_							: :	2
	on the second	<u> </u>		Dark C						Lu=10	ũ								3
	unti-rad	1			2					Ā									
-5	سيراسينان	<u> </u>					2			Lu=12	10								5
C	entratte.	1			'	2				-	ļ							* .	E E E E E E E E E E E E E E E E E E E
	melantana.				3		3			Lu=17	10								7
## 1 ## 1 ## 1 ## 1 ## 1 ## 1 ## 1 ##	Lini Jana						2											, ‡	8
\$	1	1							Contact of diabase and dacite is adherent,	1.u=32	10							·	E 9
1105.97 20	Ry	_			3	3	4				1:				1	L			20
		-	Mr	1	†	1	ł	(stici	r driller's note 4 (), 2 (substick), 3 (piece), 4 tiraqment), 5 (grain)		4			EF	<b>)</b> [	<b>)</b> C	14	₽	
		. 3, 5.		V ⊑nora (	) OSTE		1 Chard	0 ~5 (s				•						ELOPMENT	CO., 1.10.

0	LUR	PROJ	ECT	<u> </u>						HOL	E No	١,	_S	(-212				SHEE	<u>r 2 o</u>	8)
LOCATI				LEFT	_					EPTH OF HOLE 160.00		<u> </u>		COMMENCE	D	90	-10	-31		
ELEVAT				<u> </u>						IRECTION OF HOLE 90°				COMPLETE	-			-09	· .	
COORDI	NATE .			6.03	<del></del> -					ORE RECOVERY		<u>%</u> _		DRILLED		Ca	kir	.Cel	<u>i</u>	
	-		15565	1.43	1					RILLING MACHINE				LOCCED B	Υ 			: 		
NOT	Æ	ROCK NAME	6	ERY FERY		o's	1 62	پ	isau S	ERVATION OF CORE	Z	Ţ	EST	<u> </u>	E	<u>.</u>	CEMENTATION	ATER	· . ·	x
ELEVATION	DEPTH	SS	اب 0	CORE	COLOR	WEATHER-	HARD- NES	\$50 500 500 500 500 500 500 500 500 500	ROCK	DESCRIPTION	LUGEON	Ртах	မြ	DEPTH RESULT	BIT TYPE	CASING	KEN	ILL W	G.W.L (Opt.H)	ОЕРТН
	20m	· · ·		D → 100°		₹	ž	SPA	2 S		<u>-</u> -!	L	f/cm²			_	핑	ត %		
1105.97				RAIIII	<u> </u>	-	=				$\dagger$	- Ny	7611	<del> </del>		-	-	7.5		20m
	1 1									Crack surfaces are oxidized (brownish color)	Lu=34								ļ	
	, 1	İ									13	7							ļ	٦ -
	2~		-								ļ	ļ							į	-2
	1										0.									<u> </u>
1	3 -	:									Lu=10	21				. ,				3
	4		L																	}
	1	·	L			3	2	2												
.	5 1		L		3						=42	ю			. !					-6
	1		L	#	Grey						3									
1	6 T	an .			Green-Greenish						-									-6
	7	111			roe						30.5	0								
	1	Rhyolite			l le						Lu=30.	~								7
	8				ő													İ		-8
	بتلميز			11111111	Light	$\vdash$				28.4-34.0 vertical joints are predominant.	=46							Į		
	9 1				្រា		3	3		are predominant.	Lu =	લ								9
e ·	30		L	3					}		1				uuu					
	, , , , , , , , , , , , , , , , , , ,		1.			3	3	4		Crack surface is exidized but no infilling along the crack surface.	1 1				<b>686mm</b>					-30
	1 1		L				.4	{		the Grack Surface.	4.	0							}	-, [
	11		L								17.									
	2		L			1									ļ			- }		-2
	3 -						3	3			11 12 13									
	) 1 -1										בת,	3					ĺ			3
	1		-				_	1 1					: .							-4
	4				1.0			: :	- {	Crack surface is oxidized and 2-5mm calcite veins.	7	.::								
	5									and 2-sum careste verms.	I'u=	Ö				1		1		-5
	6.2		1					2				- [		. ]						
	1	a l	1		r e											ļ				-6
	7	Diabase	1		Green	3	2				Luci	01		4.						-7
	1	Ö	1		Dark		-	3			리									}
	8 -		$\perp$				1				$\dashv$						.			-8
	9 1		1								7									
	"	<u>.</u>						2	- {		7.4<1	ř					- }		# - - -	- 9
085.97	40 ]		1							- driller is note 4		$\perp$						_		40
		,			·	٠] [	Ī	i c bard) -	ITÍOK).	2 (substick), 3 (siece), 4 (froment), 5 (grain)		:		E	P		C	<b>(f)</b>		. :

Ol	LUR	PROJI	ЕСТ	.						HOL	E No	,	SK	-212			( 5	SHEE	r 3 of	8)
LOCATIO	)N	DAM	SITE	(LEFT	BANK)				DF	PTH OF HOLE 160.00		0	. 1	COMMEXCE	D _	90	-10	31		
ELEVAT	ION	112	5.97			: .	0	1	DI	RECTION OF HOLE 90°			. 1	COMPLETE	D _	91	-03·	09		
COORDIN	NATE .	X:4	51185	66.03	· ·	1 .				RE RECOVERY		ኤ		DRILLED 1		Ca	ki <u>r</u>	.Ce1	i	
		Y:5	15565	.43						ILLING MACHINE				LOGGED B	Υ					
NOI	· <u>ar</u>	AME	C	<u>_</u>		04	· ·		BSE	RVATION OF CORE	-	1	ESTI	ING	a a	9	ATION	DRILL WATER RETURN		jac
ELEVATION	DEPTH	ROCK NAME	L 0	CORE	COLOR	WEATHER-	HARD- NESS	CRACK SPACIN	Š	DESCRIPTION	LUGEON	Pmax	o <sub>d</sub>	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	RETU	G.W.L (Opt.H)	DEPTH
я.		R		0 ⇒ 100 <sub>0</sub> ,		=	₹	ვ∝			=		/cnt		_	ļ	3	۲ %		40m
1085.97	40m		工			-	-			41-42m nearly vertical	1	1.8	Cia					-~		40111
	- - - -		Т							41-42m nearly vertical Joints, Joints surfaces are brown,	Luci	10								-1
	, 12		1								13	7		٠.						
	2 -					3	2	2			-	-								2
	-				1						9									
	3-		<b>1</b> .								Lu=1	0.1								-3
	4 -		-ļ-			-	-									1				4
			1			2	2			Stick core		:								
	5		T			ا ا	-				Luci	õ								5
			Т			-														
	6		T							46.0-46.5m vertical joint	I								'	-6
	7		"L			3	2	2			9. 4	10							-	7
			T								Lu=4									
	8		1			-	_					_		:						-8
						2						o								
	9-				r e	3	2	2			Luci	ž								9
	50 -	Diabase	<u>.</u>		Green						L				Ф86тт					-50
	-	Dia	1		Derk	3	3	3		50.0-50.3. 51.0-51.3m fragments	10			P	8					
	1		T				1.		}		11=1	0.1								E 1
	; <u>- <del>1</del></u>		1								្រុ									
	2,7		T			1				53.15-53.3m fragments									1	2
1	3 -		1			2				Cracks are oxidized	Lu<1	0								E 3
			1			3	2	2			1							İ		
	4-		1								-	 								1
	5		3.			3					1,	,								-5
											'									
	.6 -		-						. :					:						-6
			ı.L							10ts of Quartz	6			). .:	-					
	7 =		L				2	3			Lu=3	0								7
	8	- 1.	L		<b>]</b>	3	1	5		Small brownish fragments	<u> </u>									8
			T				2	3			7	.		:			j			
<b>1</b>	9 -		1								Lu=1	ö		F .						9
1085 07	60		T			2	2	2			٦									E 60
1/16,6901	<u>ου</u>	<u> </u>		N 14	1	†	1	1		> driller's note 4 . 2 (widstick), 3 (place), 4 (fragment), 5 (grain)	· .			1		) [	ìC	- (d	)	
		2.11			-core los			l(hard hì∼6 (d	~5 (85	fU	*.		٠.	77					ELOPMENT	CO., LTD.

OL.	UR	PROJI	CT					· · · · · · · · · · · · · · · · · · ·			1101.	E No.		SK-	212			1.5	HEE	4 of	8)
LOCATIO	X .	DAM	SITE	(LEFT	BANK)	<u> </u>	-	<del></del>		The state of the s	160.00		ß		COMMENC	-					
ELEVATI	ON.	112	5.97		<u> </u>		ß	<u> </u>		RECTION OF HOLE				•	COMPLET	-		-03-		<u></u>	
COORDIN	ATE		7 7 7	6.03									%		RILLED		Ca	ķir.	Celi	<u> </u>	
		Y:5	15565	. 43						TLLING PROJETYE		T			LOGGED	BY					
ELEVATION	DEPTH	ROCK NAME	. O G	CORE RECOVERY	COLOR	WEATHER-	HARD- NESS		-	RVATION OF CORE	ON	LUGEON	Ртвх	esti o	DEPTH RESUL	BIT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	<u>G.W.L</u> (Dpt.H)	БЕРТН
	60m			0 - 100%		=	Œ	0				╁╌	Kgf	/cril				O	%		60m
1065.97	1		1 1			2	2	3		Sheared zone (consolidated)		Lu<1	10								-1 -2
	3		1 1				2	2				Lu<1	10								-3
	5		1 4 1			3	2	2 3				Lu=4.1	0.1								5
	7		1 1							Fresh and hard Cracks are slig		, ru<1	10								8
	9-	Disbase	<del> </del>		Green	2	2	1				Lu<1	0.1			8 6 mm					70
	1 -	Ď	1		Dark	3	2	2		72.0-72.4m cal	cite vein	Lu<1	01			3					2
	3		1   1   1			2	2	2		Pragments		Lu<1	01							73.90m ¥	ا ما
	4 -		1 1 1			3	3	2 5 3		Grack surfaces brownish	are	Lu<1	10							(Pinai	9 00 00 00 00 00 00 00 00 00 00 00 00 00
	6 · 7 8 ·					2	2	2		77.0-77.2 somew		Lu<1	10								7 7 8
1045 97	9 - 80					3		2		> dr#sr's note 4		Lu<1	0.1								9
					}	Ţ	1		Halic d ~5 ta	k). 2 taubatiok). 3 lpiece). 4 tireop	ent) filgeein	:	;		•	CECI				I <del>D</del> JELOPMENT	co ITO

0	LUR	PROJ		-								E No			212			•	HEE	<u> 5 of</u>	8 }
LOCATIO	)N	DAM	SITE	(LE	FT	BANK_			-		EPTH OF HOLE 160.00	·	<u>m</u>		COMMENCE			-10-			
ELEVAT	101												· 		COMPLETE	_		-03-	-	<del></del>	
COORDIN	NATE _	X;4			:			· 			ORE RECOVERY		%		ORILLED I		Cal	kir.	<u>Cel</u> i	<u></u>	
	, , . <u>.</u>	Y:5	15565	. 43							RILLING MACHINE			•	LOGGED BY	Y _		1.1	<u>.</u>		
8	-	¥E.			<u>ک</u>		10.		(	BSE	RVATION OF CORE		T	EST	NG	PE	Ċ.	TION	EX.		æ
ELEVATION	рертн	ROCK NAME	១០។	CORE	RECOVE	COLOR	WEATHER-	HARD-	CRACK	ROCK EVALUATIO	DESCRIPTION	LUGEON	Ртах		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	ā j	G.W.L (Opt.H)	ОЕРТН
1045.97	80m			o ⇒ i	100%			,,,,,,				-	Kgf	/cm²					%		80m
1030707	1										fragments in some places Surfaces of fragments are									i	
	1 -		1					2	3		brown.	Z=n-I	10								,
	4		1				3	\$	\$												
	2		1					3	4												-2
	3-		T									1,441	0								3
			1.									្រ័							.		
	4-					ļ					:									I	4
	alten.		<u>+</u>				2	2	.5												
	5		1									[MC]	2		, ,						5
	1		T																		6
	6-		T	Ш			2 3	2	3.												Ė
	7-		1									Žu<1	07								7
	1			W								Į Ji									
	8		-								Fresh and hard stick core		_								8
	11111											1									
	9 -		T			c						Lu<1	0,1								9
	al and	988	Ţ			Groer	2	2	2			-				Ø86mm					90
	90 -	Digbase	1			Dark	-									8.0					E 30
	1		L			L N						Lux.	0						ĺ	:	Ē, [
									:			Jā									
	2							1. 1													-2
	3		+				-				92.5m,2cm sheared zone. (consolidated)										ŧ :
	3-	1.3							2			Lux 1	°						١.		£ 3
			1							1					<u> </u>					]	E <sub>4</sub>
	4		1	躙				2			Mainly fragmental Surfaces of fragments are	•									
	5		1				3	3	3		brown.	Lu<1	10								5
			1						3			교						{			
	6 -							3				-	-	1							6
			1					1	4			0									
	7 -		1				1					Lu=0	0.7								7
							-	3	4		Crack surfaces are fresh below 97.6m depth.				:						E 8
	8 -		1	闡					3		Deion 37.0m dopth.		-								,
	9-			關			2	2	-	-	97.8-98.0m sheared wome,	Lu=0	10		1						-9
		4.2	1						2		Fragments	1									
1025,97	100	L	Γ	加	Щ	J		<u> </u>	1_	L	▶ হাবে হ'বিদ্ধাঠ ∢		Щ.		<u> </u>		1	1	<u> </u>	1	F 100
		. i	4 - 4:	M	2	1	Ī		1 (har	ជា~5ផ	kl, 2 (suballok), 3 (niece), 4 (treamont), 5 (orain) soft)								R DEV	P TELOPMENT	CO ITO
				1_	, L	–core k – RQD	12#	l (frei	#V~6	decon	ngosed)						1	- 192		sitti	44. <sub>1</sub> £10.

						<b>.</b> .	L V	<i>_</i>	4 I O	LOG OF DIVILL							<u></u>			
OLUI		PROJE												-212			,	HEET		8)
LOCATION				LEFT						EPTH OF HOLE 160.00		Ø	•	COMMENCE!	_			31		
ELEVATION		1125		C 02				<u> </u>		TRECTION OF HOLE 90°				COMPLETEI DRILLED I	_		-03-		- <b>-</b>	<del></del>
COORDINAT		λ:4: Υ:5						_						LOGGED BY		Udi	V1( •	CC1.		
	r		3303						:_	RILLING MACHINE  ERVATION OF CORE	<u> </u>		EST		' 		æ	~ 1		
ELEVATION	DEPTH	ROCK NAME	L 0 G	CORE RECOVERY	COLOR	WEATHER-	HARD- NESS	CRACK	ATION	DESCRIPTION	NOEDN	ртах		DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WATER	G.W.L. (Opt.H)	оертн
10	00m			0 -> 100.							<u> </u>	Kgf	/cni					%		100m
	and the state of		1			2	3	4		Fragment surfaces are slightly weathered.	Lu=0	10								1
	3 4		1 1					2		100.4-100.6 silicified	Lu </td <td>10</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td>	10								3
	و و ديدايينيلينييل		1					3		Calcite along cracks	Lu=0	1.0								5
	ا بىنىلىنىڭىنىئانىن		1 1 1			,					Lu=0	10								7
	8 6. C	sbase	十 十 十		Green	5	2	1		Fresh and hard, stick to substick core	Lucı	10			486mm					9
	10	Disk	1 1 1		Dark	2		2			Lu<1	10		:	8.8					المسالسية المساد
	2 3										Lucc	10								33 4
	ح 2. و السياسيرسياسي		± ± ±					2		115,1-115.5m cracky Stickenside along crack surface.	Lu=1.3	10								5
	. 6		1			3	3	3		Vertical Joint	Lu=1.5	07								7
	8 8		1 1			2	2	2		Silicified (30deg)	ru=0	10								120
11005.97] 13	20 1				—core R	ns		l Grore	d-54	). Admer's note 4 k). 2 (substick). 3 (piece). 4 (frequent). 5 (grain) cost) opposed			· :					R DEV	D ELOPMENT	

0	LUR	PROJ	ECT								E No	),	SK	-212			13	HEE	T 7 0	f 8)
LOCATI	0\	DAM	SITE	(LEPT	BANK	)			D	EPTH OP HOLE 160.00		<u> </u>		COMMENCE	D _	90	-10	31		
ELEVAT	10N	112	5.97			-		<u>n</u>	D	IRECTION OF HOLE 90°				COMPLETE	D	91	-03	09		
COORDI	NATE			6.03					C	ORE RECOVERY		Ŷ,		DRILLED	_		kir.		i	
				5.43						RILLING MACHINE				LOGGED B						
	-		10000		<u> </u>				·	ERVATION OF CORE	<del></del>	т	EST		· -		Æ	~		
NOIL	H.	NAM	C	E Y		œ	y y		3	- Conc	z	•	T		YPE	Ş	15	ATE:		프
ELEVATION	DEPTH	ROCK NAME	0	CORE	COLOR	WEATHER-	HARD- NESS	PACK	SOCK	DESCRIPTION	LUGEON	Pmax	P	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	RET	G.W.L (Opt.H)	DEPTH
		~				.₹	<u> </u>	SPA	E S		1-	J	<u> </u>				벙			
1005.97	120m			0 → 100 <sub>9</sub>	il	<del> </del>	├-					Kgi	f/em		_	<u> </u>		%		120m
	1					١.		3												
	1		7.			2	2	3.			Luci	1 2			:					-1
:		٠.	1									.								
	2-		1					2			-	╁╌	1						,	2
	1		: s,			3	3	3		Sheared zone (40deg) Fragment	23									
	3 1	<b>6</b>	1		Green		_	4			1.0=1	01								-3
	1	Diabase	1								1		:							
	4 1	ŭ	1		Dark							1	<u> </u>							4
	5				"					125.5-125.6m cracky	.3									
		Ì				2	2	2		,	Lu=1	] =								5
	6		1		. :						L		] -							6
			1																	
	7-		1								Luc1	0		:						7
	1						-			Many Qz(2-3mm,dlameter)	្ម									
- [	8 -	ĺ				3.	3	3			<u> </u>			1						8
	1	to	Ļ			2	2	2		Partially fragmental										
	9 -	Rhyolite	L		Grey	L					Lu=1.	2								-9
		£				2	2	3			급				E					
	130					3	ŕ				-	<del>  _</del>		٠.	ø86mm					130
	-	рь	士		D.gn	2~ 3	3	3		Dark green					18					
***	1 -		L					2			Lu.	0 1								ì
	1		Ľ					3	'											
	2				<b>.</b>														•	2
						, ,	-	.		Crack surface is slightly	1 2									
	3		L					1	:	reddish brown.	Luki	Ä								3
	. ]		L															ļ		
	1				,															"
	5	ę l	,		Grey	5	٠,				1.8	0								-5
•	1	Rhyolite			rig Ti					Flow structure	Lua1									; ;
	6 -	Ϋ́ P	L [		Whit1					Trow structure	_	<u> </u>			y.				· I	-6
	4		L		¥.	2	2										1.			
	7							2			Luci	0								7
, s ,	1								. : :		1				.					
	8 -		-						. "		1	$\vdash$								-8
	1	.																Ī		
			L			H				Fragments in some place	Luci	10				.				9
	=					2	2	3	• •	The state of the s								.		
985.97[	140 1		[	7 Y mmi	<b></b>	<u> </u>	1	†		+ driller's note 4	<del></del>		<b>_</b>			9 E	ا ا	10	·	1.10]
			f	N K	nore he	ا 		ihar di	(stick) ~5 (st lecomo				•				) C		LOPMENT	CO ITO

OL.	UR .	PROJ	ECT							<u>H</u> OL	E No		SK	-212			_[_	HEE	r 8 of	[8]
LOCATIO										EPTH OF HOLE 160.00				COMMEXC	_					
ELEVATI		112								IRECTION OF HOLE 90°				COMPLETI	_			09		_ <del></del>
COORDIN	ATE _									DRE RECOVERY				DRILLED		<u>Ca</u>	kir.	Ce L	<u>i</u>	
			15565	.43	,					RILLING MACHINE  ERVATION OF CORE	<del></del>		EST	LOGGED I	J					
ELEVATION	DEPTH	ROCK NAME	507	CORE	COLOR	WEATHER-	HARD- NESS		ROCK EVALUATION S	DESCRIPTION	LUGEON	Pmax	C O	DEPTH RESULT	BiT TYPE	CASING	CEMENTATION	DRILL WATER RETURN	G.W.L. (Opt.H)	ОЕРТН
	40m		 	0 - 100%					100			Kg	/cm	<u> </u>				%		140m
985.97	deen		L			2	2	3		a de la companya de l										
	1 1		Ŀ							Some vertical joints	Luzo	0 7		1.						1
	, T	t to	L				1							ı						
	5 1	Rhyol1te	L			2	2	2				<u> </u>								2
	3	전	L				-				Lu=0	0								3
	1		L			-				Fragments Slickenside of calcite	ĮÄ.									
	4		1			3	3	4		on crack surface	-	-								4
	12 12 13		1					-			Luci									-5
	, 1111		1					2			13	-								
.	6		1					3			-	-					;			6
	1		1								5	0								
	2 d		-1-				.:	2	1.5		Lu<1	l ä								7
	8 4	:	1								-					37.7 3	1			8
	1		1		100		2	_	·	Calcite on crack surface	60									
	9 1		1		i i					Carefre on crack surrace	Lu=2.	2								9
	50		ı		Greez						7				\$ 8 mm		ı			150
	50 T		1		Dark	2				Calcite on crack surface					\$8					- 150
	1				ជ័						Luci	o i								ř.
	1	9	-					2			H	٠							· : (	
	2	Diabese	-											ļ						2
	3	ñ						10			Lu<1	0								E.;
			+				2	3			ង									
	4 1		1.								-						17.			4
	1		1.								₽	10	٠							
	5 1		1				2	2	1.00		1>77	7								- 5 -
	6 4		Τ								-									6
	. 1		1.					3		Fragments	_									
	7		1				3	4			1>n7	0 ;								7
	8		1		-1. <sup>3</sup> .	2	2	2					- 1				4			8
	1					[ 5		3		Fragments and 5-10cm				•						
	9	}	-			3	3	5		coro vocticai Joint	Lu=0	0								9
965 97 1	60		1		54 ) 40 )			1		End of the Borehole										160
	1/2 160 3 Administration of the Company of the Comp												)							
		÷	1	N VI	cera los	<b>z</b> 1	i' ) Gresh	(6 Mail	-6 lac	40									LOPMENT	CO., LTD.

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<u>OLUI</u>										E No	<u>.                                    </u>	SK	F-216			_(_5	HEE	1 0	<u> 3</u>
LOCATION	DA!	SITI	E (LEFT	BANK	)	<u></u>		D	SPTH OF HOLE 50.00		Ð	_	COMMENCE	D	91	-05·	07		
ELEVATION	N	48.3				В	1	D.	RECTION OF HOLE 45°	· .		-	COMPLETE	D	91	-06-	11		
COORDINAT	TE <u>X:</u>	451184	15.76					C	DRE RECOVERY		%	_	DRILLED	BY _	M.	Celi	k		
	Y:	515663	3.26	, 1, °			1,	D	RILLING MACHINE			_	LOGGED B	Y	I	Vare	lal		
≥	Ψ.	1	<b>-</b>	T	·				RVATION OF CORE	Τ.	Т	EST	ING	T		8	K.		· · · · · · · · · · · · · · · · · · ·
ELEVATION	PEPTH ROCK NAME	L 0 G	CORE	COLOR	WEATHER-	HARD- NESS	SPACING	ROCK EVALUATION	DESCRIPTION	LUGEON	PHRX	PC	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	DRILL WAT RETURN	<u>G.W.L</u> (Opt.H)	DEPTH
1048.30	Om	<u> </u>	0 -> 100								Kgf	/cui					%		Om
1048,30	1	+							;										
	1	+				3													1
	1	+				3	4												
	2	;		<b>}</b>		1		1						1	1			.	2
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	3	+		-									į.						3
		+					3					١.						: "	_
	4 -	+			3		2												4
	_	;	<b>allill</b>		.5	3	3						<u> </u>						r e
	5 1	:		}}			3			1									5
	o Luthinil Porphyry	-		Ę			2		Generally fractured: all joint surfaces are oxi- dized; mostly no altera-	L									6
	orpi	+		Brown			3		tion in minerals, occasional feather Joints				1.						
·	7   0	+		ds.	3					134									7
	n i c	;		Pinkish			3			13									
	S Grant	:	ß	p.			4			ļ	-								-8
		+	<b>a</b>															:	<u>-</u>
1.1	9 ]	+			4	3	2			Lu=29									9
	-	;	<b>[</b> ]				3			[4]									
1	0 1	;								$\vdash$	1				:				10
							3			8									E
	1	+					3			Lu=33				1	1 :				1
		+				1	\$			-									السماء
	2	1-					4							f					2
		1								Lu=34.6	0		·			1.			
	3 -			ì			1.				-								3
	ОБ			D.gr	3	2	2		Fractured zone, oxidized						. :				4
	4 3 Gp.	-		p,tr	2	3	3		Fractured zone, oxidized joint surfaces	8				'					
	5	-								1									5
	4	1								Lui									i l
	6 =	1					ı			<u> </u>			,						6
		$ \perp $		<b>}</b>				·						İ					
				ę	3	2			Allegania de la compansión de la compans	Lu=1]								:	7
	2 Junion Sadalo	-		ar,					Oxidized joint surfaces	1		: 1					ļ.		
	8 <del> </del>	1		Α .						-									8
	7	1			•		2		Hard, sound	12								;	<u> </u>
	9 -	1			1, 1	٠.	3			Lu=12									9
1028 30 21	, <del>1</del>					11	ļ		en grand de Marie de Austria. De la companya de la companya de la companya de la companya de la companya de la companya de la companya de la										20
. Jay, 301 21	<del></del>	<del></del>	N 7	1	1	1	Í	(alick	⊳dr≅er's nate ∢ . 2 (pubatick), 3 (piece), 4 (freqment), 6 (grein)						) [		i je		LE
				∖i —core los	. I 8 1	i lireah	therd	J~5 (so	fti									LOPMENT	CO., LTD.

0	LUR	PROJ	ECT							HOLI	. No	<u>.                                    </u>	SK	E-216			15	HEE	2 01	3)
LOCATI	0.0%	DAM	SITE	(LEFT	BANK					SPTH OF HOLE 50.00		m	·	COMMEXCE	) _	91	-05-	07		
ELEVAT	_	104		<del></del>				<u> </u>		IRECTION OF HOLE 45°		<u>-</u>	_	COMPLETE	-	91			·	
COORDI	NATE _						<u>.</u>			ORE RECOVERY			_	DRILLED I	_					·
			15663	r	1				·~	RILLING MACHINE	1			LOGGED B	Y :	<u>.</u>				
T ON	Ŧ	NAME	IJ	75 FF		ė	83			ERVATION OF CORE		Ι	EST.		ХРΕ	5N.	ATION	RATER		픋
ELEVATION	DEPTH	ROCK NAME	7	CORE RECOVERY	COLOR	WEATHER-	A S	CRACK	ROCK	DESCRIPTION	LUGEON	PEX	Ь	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	RET	G.W.L (Opt.H)	DEPTH
	20m			0 → 100-		3	=_	0"	<u>.</u>		-	Kgi	/cml				5	%		20m
1028.30			1.										[							
	1 -		T								1,4=10					: .				1
		-	: <b>.</b> L ,			}		,			ដ								:	
	2	9	1		Grey															-2
	3 7	Diabase	1		Dark G	3	2	١.			0									- - 3
	, 1 1	Δ	1		70			2			111									
	4																			4
	1	. 1									1.0									
	2-1		1				-	2~3			Lu=10.								At	5
	6 -	ý	+		Ľ,					Oxidized joint surfaces, feather joints in place.										6
	1	Porphyry			Brown	1		2		feather joints in place.	Ø									
	7		+		Pinkish	3	2	3			Zu≡9									7
	8 -	Granite	+		Piny			3			٦									8
		ত	+							· · · · · · · · · · · · · · · · · · ·	7	}								
	9 1										1=4			:						9
	1		1.								7									
	30 -	6	1		<u>}</u>		2	s		#		3					. 1			-30
	- 1	abase	1		grey	3					8 8								٠.	
	1	Dia	1		Dark						Luz									
	2		T								-									5
	31		1				3	3	:		17								:	3
	3 1		<u> </u>					3			Lu<1		,							[- [ ,
	4		+			}	3	3		Fractured zone, oxidized Joint surfaces	_			·						-4
			•				\$ 4	3			7									
1 17	5 7		+,				4	· "			Lu=8									5
	8 -	hyr	+		Brown	3		2												6
	4	Porphyry	+				2	: :			₩									
	7 -		+		Pinkish		-	2			1.0=4									7
	1	Granite	+		T.	4		3			Į į									
	8 -]	ט	+	#				3.		Fractured wone	<u> </u>								i	8
	9		+				3	4		actor of solie	8.6						.			9
	1		.   					လို			Lu±				·		٠.			
1008.30	40 i					لـــا ا	†	-	اسبا	> driller's note « 1. 2 lauhalicki, 3 ipisco), 4 ffragmenti, 5 igriku	<b></b>	J	l	 <b>E</b>		)		     <del> </del>	<del></del>	<u> </u>
	E + 12						, ,	ihardi 1 - E ic	~5 tec	of ()		-					·		LOPMENT	CO LTD

OLUR	PROJ	ECT		<u></u>					HOLE	E No	<u> </u>	SK	E-216			( SI	IEE]	[ 3 of	3)
LOCATION	DAM	SITI	LEFT	BANK	)			DE	EPTH OF HOLE 50.00		Ф	_	COMMENCE	) _	91-	05-0	)7_		
ELEVATION	104	8.3					<u>n</u>	DI	RECTION OF HOLE 45'				COMPLETE	)	91-	06-	11_		
COORDINATE	X:4	51184	5.76	<u> </u>				CC	ORE RECOVERY	. :	%	_	DRILLED I	BY _	М.С	elil	<u> </u>		
	Y:5	15663	3.26	<u> </u>				DF	RILLING MACHINE	: .	<del></del> -	-	LOGGED B	Y _	I.V	arda	<u>l</u>		·
<b>8</b> _	Ψ.	I	`		7	·	í		RVATION OF CORE		Ţ	EST	ING	ш		NO.	<u>.</u>		
EL EVATION DEPTH	ROCK NAME	L 0 G	CORE	<u></u>	WEATHER-	HARD- NESS	CRACK	EVALUATION	DESCRIPTION	LUGEON	Pmax	<u> </u>	DEPTH RESULT	BIT TYPE	CASING	CEMENTATION	RETUR	G.W.L (Opt.H)	DEPTH
40n 1008.30	<u> </u>	+	0 → 100 <sub>9</sub>	<b>/</b>	<del> </del>	<u> </u>	ļ			_	Kgf	/cni			_	-	%		40m
1		+				3	2 1 3		Feather Joints	Lu=20									1
2		+				3	3	- 1	Fractured zone, oxidized Joint surfaces	6									8
3	7.3.V	+ + + +		c c	3	3	4		Joint am, wees	Lu=1									3
5	e Porphyry	+ + •		ish Brown						Lu=4.3	10								5
6	Granite	+ + + .		Pinkish		3	з		Fractured zone, exidized joint surfaces	2 6									6
7 - 8 -		+ +			4	S	\$	`		Lu=6.								į	8
9		+				4	4			Lues									9
998.30 50		+																	5Q
1									End of the Borehole									<del>-</del>	
2																			2
3											:								3
4-																		j	4
5 6																			5 5 6
7 -																			7
8												. :							8
988,30 60																		· · · · · · · · · · · · · · · · · · ·	9 60
				1	. 1	1	i 1 Onerdi	(stick)  -5 (sc	v driller's note 4 1. 2 (substick). 3 (piece), 4 (fragment). 5 (grein) oft)			•	E	P		C	(H	)	· · · · · · · · · · · · · · · · · · ·

OLU	R	PROJE	CT_	, , , , , , , , , , , , , , , , , , ,									SK-211			( SHEET			<u> 1 of</u>	8)
LOCATION	ION DAM SITE (RIGHT					BANK) DEP				PTH OF HOLE 150.00				COMMENCE	90-11-15				· · · · · · · · · · · · · · · · · · ·	
ELEVATIO	EVATION 1103.87					m DIR				RECTION OF HOLE 90°				COMPLETE	91-04-04					
COORDINATE <u>X:4511860.16</u>					CORE RECOVERY										-					
		Y:5	5884	.19	DRILLING MACHINE							LOGG				<u>I,</u>	I.Vardal			
<u>s</u>	æ	AME	65	E ERY		o'e	60	(2)	BSE	RVATION OF CORE			EST	NG	E E	5	CEMENTATION	DRILL WATER RETURN	,	E
ELEVATION	DEPTH	ROCK NAME	0	CORE RECOVERY	COLOR	WEATHER- ING	RO- MES	ACK	SE	DESCRIPTION	LUGEON	Ртах	PC	DEPTH	BIT TYPE	CASING	MENT	ZETZ ZETZ	G.W.L (Dpt.H)	DEPTH
		8	~ <del></del> -		(3	WE	HARD	સુજ	- X		-						핑	当 %		
1103,87	Om			0 → 100 <sub>%</sub>						Open exeavation	-	rgi	/cm					76		Om
	بالديد	-				_														
	4		+					·		SHime										
	2		+			4	3	4		Highly weatherd Fragments	l r	1				1				2
			+			-		3				'								
	3		+																i	3
			+																	1
	4		+		i i		•			1-2cm thick diabase dikes have intruded along	8									4
	5		+					2		joints between 0.0-20.0m. Frequent feather joints.	24			·.			. :		. :	5
	-					3	3			alteration in minerals, oxidation in joint surfaces.	Lu									
	6							3		5.9-6.2m, 6.6-6.8m Cracky C=4-3	-									6
	. The		1								99									
	7 =		+,					3			Lu=3									7
	8 -		+																	8
			.+.								ເທ									
	9 -	λ.	+			-	_	-			# 33				]					9
		T.S.U.	+		E MO	3	3	3		9.4-9.6m, 10.3-10.6m Fragments	Luz	)			g					
.     1	10	Porphyry	· -		ង	4		1			-	1			φ86.πm				: '	E 10
		t te			inkish						50									
	1	rani	•		2.0			2			I U									
	2	O	+					3			-	្ន		1						2
			+				2			Fairly hard and substick	4									
	3		+							core, but many hair cracks	Lu=4									<u> </u>
			+			3	5		:											<u> </u>
	1		+				:			1-2cm thick diabase										
	5 -		+				3	2		intrudes along vertical Joints.	Lu=9									5
	_										니									
	6 -										-	1								E 6
											22									-
	7 -		+				3	3			Lu=22									
	8		+			3	\$ 4	1		Fractured zone fragments and piece core.	_									8
			+			,	-	-		llighty weathered	80									
	9		. :• - <b>-</b> 1-			4	3	2		Vertical Joint from 18.8m to 19.9m.	Lu=7					1.				9
	-		+					3			Ä									20
1083.87	1083.87] 20   WHATE												l	EF	<u> </u>	C	210	Ð	استه سود	
				KA KI	4	t.	·, 1	I Ghard						-					ELOGUENT	40 170