Historical Data of Suspended Sediment Concentration

Suspended Sediment Concentration Measurements at No.430 Stream Gauging Station

Year 1974

(Unit : ppm)

Month / Day	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		63.0	470.0	1,830.0								
2	58.0	73.0	168.0	457.0								
3	83.0	82.0	178.0	702.0								
4	95.0	41.0	183.0	882.0								
5		110.0										61.0
6	164.0	65.0	1,320.0									34.0
7	131.0	131.0	338.0									43.0
8	104.0		310.0									51.0
9	102.0	157.0	316.0									65.0
10	76.0	133.0	360.0									190.0
11	129.0	85.0	348.0	597.0								52.0
12	103.0	239.0	289.0	498.0								48.0
13	60.0	198.0	413.0	791.0								102.0
14	59.0	229.0	203.0	1,230.0								26.0
15	50.0	212.0	397.0	648.0								66.0
16	64.0	210.0	300.0	788.0								38.0
17		194.0	149.0	1,400.0								108.0
18	66.0	197.0	125.0	1,350.0								38.0
19	47.0	181.0	116.0	3,260.0								145.0
20	58.0	433.0	132.0	3,070.0								22.0
21	48.0	447.0	184.0	3,310.0								51.0
22	52.0	458.0	187.0	2,390.0								
23	51.0	425.0	201.0									
24	30.0	427.0	174.0									23.0
25	60.0	465.0	182.0									
26	53.0	200.0	177.0									
27	74.0	164.0	501.0									
28	101.0	182.0	1,200.0									30.0
29	67.0		468.0									
30	134.0		945.0									25.0
31	57.0		478.0									

Suspended Sediment Concentration Measurements at No.430 Stream Gauging Station

Year 1975

(Unit : ppm)

Month / Day	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	50.0	200.0	748.0		684.0	1,320.0	1,460.0				61.0	65.0
2				279.0	699.0	974.0	1,170.0				52.0	
3	58.0	102.0	372.0		695.0	1,070.0	1,530.0				47.0	54.0
4				332.0	853.0	1,200.0	2,070.0				45.0	
5	91.0	100.0	327.0		702.0	3,390.0	963.0				289.0	564.0
6				284.0	692.0	2,720.0	1,380.0				150.0	
7	42.0	93.0	278.0		1,320.0	1,380.0	1,640.0				54.0	25.0
8				260.0	800.0	1,080.0	1,630.0				303.0	
9	96.0	100.0	318.0		876.0	1,520.0	1,640.0				64.0	54.0
10			1,190.0	253.0	820.0	1,460.0	1,080.0				78.0	
11	56.0	192.0	235.0		905.0	1,490.0					72.0	89.0
12					952.0	1,660.0	1,320.0				146.0	
13	33.0	340.0			128.0	1,300.0	1,800.0				103.0	133.0
14				1,480.0	748.0	1,540.0	1,090.0				70.0	
15	8.3	311.0	315.0	652.0	1,670.0	2,010.0	1,870.0				58.0	46.0
16				749.0	1,080.0	1,640.0				144.0	137.0	
17	42.0	278.0	253.0	640.0	1,060.0	1,490.0				114.0	83.0	104.0
18				736.0	1,270.0	1,380.0				178.0		
19	60.0	234.0	223.0	1,490.0	1,370.0	1,230.0				164.0	58.0	294.0
20					1,420.0	1,300.0				181.0		
21		402.0	213.0	1,230.0	1,260.0	4,000.0				110.0	28.0	221.0
22				1,440.0	3,150.0	1,230.0				69.0		
23	500.0	409.0	170.0	1,090.0	1,420.0	1,250.0				113.0	53.0	63.0
24				963.0	1,750.0	1,030.0				224.0		
25	93.0	314.0	293.0	549.0	1,120.0	1,660.0				47.0	9.0	92.0
26				660.0	1,340.0	1,810.0				181.0		
27	77.0	324.0		597.0	1,340.0	1,600.0				85.0	125.0	70.0
28				574.0	1,300.0	1,460.0				23.0		
29	558.0		334.0	629.0	1,120.0	1,260.0				62.0	58.0	204.0
30				1,080.0	1,320.0	1,340.0				133.0		
31	486.0		443.0		2,170.0					163.0		111.0

Suspended Sediment Concentration Measurements at No.430 Stream Gauging Station

Year 1976

(Unit : ppm)

Month / Day	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		217.0		592.0	1,450.0	7,050.0	2,870.0	2,520.0	38.0	57.0	17.0	
2	426.0		84.0	484.0	885.0	8,010.0	3,670.0	935.0	118.0	160.0	22.0	56.0
3		101.0		1,000.0	705.0	5,040.0	2,510.0	989.0	38.0	1,590.0	21.0	
4	22.0		137.0	1,120.0	688.0	7,170.0	2,950.0	984.0	49.0	53.0	50.0	51.0
5		112.0		401.0	667.0	5,920.0	2,460.0	837.0	40.0	69.0	47.0	
6	238.0		78.0	179.0	416.0	5,020.0	3,110.0	1,690.0	54.0	57.0	25.0	68.0
7		8.9		399.0	747.0	5,440.0	7,320.0	809.0	229.0	40.0	61.0	
8	178.0		111.0	937.0	803.0	4,950.0	4,900.0	476.0	162.0	45.0	24.0	65.0
9		309.0		874.0	457.0	60,800.0	17,100.0	1,690.0	72.0	37.0	21.0	
10	122.0		192.0	373.0	967.0	7,620.0	6,260.0	3,780.0	71.0	47.0	51.0	26.0
11		51.0		373.0	318.0	5,090.0	4,570.0	3,170.0	87.0	38.0	24.0	
12	126.0			940.0	457.0	56,000.0	16,600.0	2,800.0	113.0	36.0	31.0	
13		235.0		459.0	1,520.0	3,960.0	11,300.0	588.0	91.0	40.0	23.0	
14	145.0		167.0	352.0	6,690.0	11,200.0	7,640.0	751.0	71.0	54.0	16.0	
15		67.0	250.0	605.0	4,380.0	4,100.0	6,220.0	722.0	44.0	231.0	25.0	
16	191.0		310.0	440.0	7,990.0	979.0	9,030.0	397.0	51.0	54.0	84.0	536.0
17		292.0	268.0	567.0	5,510.0	976.0	3,740.0	248.0	28.0	59.0	462.0	
18	285.0		638.0	676.0	9,280.0	1,070.0	6,840.0	52.0	42.0	38.0		75.0
19		137.0	238.0	842.0	4,480.0	483.0	5,060.0	305.0	59.0	15.0		
20	141.0		233.0	1,790.0	5,350.0	2,580.0	6,280.0	265.0	43.0	28.0	35.0	76.0
21		126.0	239.0	427.0	3,610.0	2,200.0	2,670.0	134.0	48.0	41.0		
22	171.0		552.0	6,960.0	6,600.0	16,400.0	4,930.0	389.0	134.0	53.0	54.0	101.0
23		141.0	688.0	435.0	5,780.0	15,000.0	2,190.0	102.0	534.0	505.0		
24	69.0		625.0	463.0	6,190.0	16,300.0	3,040.0	186.0	50.0	31.0	58.0	71.0
25		112.0	903.0	2,530.0	7,750.0	2,650.0	2,380.0	433.0	92.0	1,770.0		
26	98.0		690.0	641.0	5,650.0	1,360.0	2,420.0	105.0	179.0	42.0	102.0	63.0
27		295.0	772.0	476.0	5,200.0	2,880.0	4,670.0	185.0	39.0	23.0		
28	160.0		729.0	567.0	12,000.0	1,110.0	3,560.0	22.0	42.0	33.0		60.0
29			1,000.0	5,410.0	8,000.0	1,580.0	1,800.0	97.0	56.0	21.0		
30	87.0		563.0	506.0	6,950.0	16,400.0	5,470.0	54.0	46.0	32.0	51.0	18.0
31			453.0		5,160.0		1,750.0	219.0		40.0		

Suspended Sediment Concentration Measurements at No.430 Stream Gauging Station

Year 1977

(Unit : ppm)

Month / Day	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	246.0			157.0		5,700.0		550.0	165.0	69.0	114.0	
2		268.0	995.0	151.0	6,070.0	6,460.0		659.0	134.0		166.0	51.0
3	115.0			705.0	6,250.0	6,080.0		594.0	145.0		141.0	
4		389.0	825.0	892.0	6,790.0	6,450.0		694.0	161.0		147.0	49.0
5	37.0			129.0	4,800.0	6,870.0		537.0	141.0	61.0	122.0	
6		117.0	410.0	124.0	6,440.0	4,250.0		708.0	279.0	65.0	141.0	47.0
7	82.0			173.0	6,340.0	4,140.0		330.0	197.0	98.0	108.0	
8		2,320.0	1,360.0	159.0	6,650.0	5,060.0		433.0	163.0	63.0	118.0	121.0
9	79.0			110.0	6,880.0	4,100.0		454.0	135.0		116.0	
10		214.0	2,520.0	754.0	6,860.0	3,750.0		331.0	142.0	41.0	125.0	40.0
11	132.0			109.0	6,140.0	4,020.0		1,560.0	233.0	39.0	76.0	
12		202.0	896.0	217.0	3,810.0	4,740.0		12,300.0	242.0	76.0	34.0	50.0
13	115.0			6,810.0	3,340.0	3,840.0		9,250.0	284.0	60.0	44.0	
14		200.0	2,210.0	6,830.0	3,380.0	3,410.0		8,910.0	272.0	60.0	57.0	42.0
15	2,670.0		896.0	6,280.0	3,350.0	4,040.0		6,220.0	152.0	67.0	49.0	
16		2,240.0	2,420.0	6,860.0	2,970.0	3,970.0		1,130.0		94.0	227.0	163.0
17	2,200.0		1,260.0	6,430.0	3,460.0	2,090.0		244.0	103.0	118.0		
18		337.0	788.0	5,310.0	3,120.0	3,310.0		245.0	84.0	123.0	61.0	61.0
19	107.0		2,190.0	5,960.0	3,250.0	3,700.0		286.0	215.0	109.0		
20		323.0	1,240.0	6,500.0	3,270.0	4,300.0			200.0	115.0	48.0	38.0
21	302.0		1,870.0	6,410.0	3,370.0	4,010.0		298.0	206.0	109.0		
22		258.0	1,130.0	6,470.0	3,480.0	4,600.0		187.0	252.0	807.0	55.0	22.0
23	140.0		2,320.0	6,650.0	4,380.0	3,380.0		207.0	284.0	100.0		
24		5,490.0	2,400.0	6,630.0	4,570.0	2,260.0			620.0	139.0	50.0	53.0
25	71.0		869.0	5,900.0	4,810.0	3,600.0		155.0	111.0	126.0		
26		2,700.0	133.0	6,670.0	2,940.0	3,980.0	473.0	161.0	30.0	121.0	139.0	849.0
27	214.0		71.0	6,250.0	3,080.0	4,170.0	985.0	215.0	93.0	111.0		
28		1,070.0	125.0	3,700.0	3,020.0	2,130.0	756.0	156.0	80.0	158.0	158.0	127.0
29	74.0		2,240.0	6,010.0	6,500.0	6,570.0	1,130.0	219.0	132.0	111.0		
30			979.0		6,890.0	378.0	581.0	103.0	113.0	91.0	39.0	228.0
31	249.0		129.0		5,470.0		479.0	108.0		96.0		

Suspended Sediment Concentration Measurements at No.430 Stream Gauging Station

Year 1978 (Unit : ppm)

Month / Day	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		458.0		1,400.0		710.0	2,290.0	1,090.0				1,330.0
2	31.0		773.0	1,090.0	2,060.0	678.0	2,420.0	1,100.0				433.0
3		603.0		914.0	1,860.0	820.0	2,400.0					841.0
4	99.0		765.0	1,240.0		759.0	1,700.0	1,260.0				170.0
5		564.0		1,180.0	1,960.0	920.0	1,380.0	1,110.0				184.0
6	292.0		11,800.0	2,190.0	1,470.0	822.0	1,580.0	1,180.0				215.0
7		699.0		703.0	1,860.0	851.0	2,300.0	1,590.0				204.0
8	680.0		643.0	1,600.0	1,210.0	833.0	1,830.0	1,190.0				90.0
9		653.0		951.0	2,230.0	902.0	1,960.0	1,380.0				144.0
10	250.0		963.0	1,270.0	1,780.0	826.0	2,550.0	1,510.0				158.0
11		261.0		1,090.0	1,520.0	1,070.0	2,560.0	1,080.0				6,700.0
12	369.0	555.0	798.0	971.0	461.0	904.0	2,530.0	1,300.0				1,050.0
13				896.0		5,260.0	2,230.0	1,170.0				
14	454.0	795.0	749.0	884.0	935.0	874.0	2,590.0					1,670.0
15			1,610.0	1,070.0	877.0	3,560.0	2,390.0	1,240.0				1,570.0
16	439.0	703.0	1,200.0	987.0	891.0	3,120.0	746.0	889.0				208.0
17			1,260.0	781.0	656.0	5,080.0	794.0					300.0
18	529.0	505.0	980.0	961.0	873.0	2,720.0	964.0					718.0
19			1,200.0	2,050.0	934.0	745.0	627.0					19.0
20	448.0	570.0	1,210.0	1,260.0	12,500.0	4,040.0	746.0					721.0
21			911.0	1,790.0	913.0	4,210.0	782.0					110.0
22	494.0	709.0	1,200.0	1,840.0	346.0	6,060.0	838.0					166.0
23			1,120.0	1,820.0	687.0	5,390.0	1,080.0					165.0
24	453.0	537.0	1,550.0	1,100.0	7,210.0	3,880.0	1,000.0					201.0
25			930.0	1,890.0	7,360.0	785.0	1,150.0					3,970.0
26	263.0	799.0	2,050.0	1,880.0	7,550.0	2,280.0	825.0					224.0
27			1,620.0	2,000.0	7,920.0	2,260.0	747.0					101.0
28	497.0	584.0	1,860.0	2,640.0	7,340.0	3,520.0	838.0					121.0
29			1,160.0	1,910.0	7,430.0	1,620.0	1,170.0					162.0
30	458.0		1,170.0	1,850.0	7,580.0	2,430.0	1,010.0				296.0	223.0
31			889.0		7,250.0		1,140.0					

Concentration Measurement of Suspended Sediment at No.430.5, Damauli Gauging Station in Year of 2000

Month-Year	Date	Gauge Height(m)	River discharge (m^3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
June.2000	27	2.65	202.6	1,334.20	23,355
June.2000	28	3.18	471.4	6,796.63	276,840
July. 2000	1	3.18	471.4	3,775.20	153,771
July. 2000	2	3.15	450.6	1,999.00	77,825
July. 2000	3	2.78	251.6	1,866.17	40,571
July. 2000	4	2.80	260.0	2,404.57	54,017
July. 2000	5	2.89	300.7	2,827.07	73,458
July. 2000	6	3.09	411.3	7,982.40	283,661
July. 2000	7	3.84	1,191.9	7,334.37	755,275
July. 2000	8	3.87	1,239.8	4,430.23	474,546
July. 2000	9	3.04	380.8	5,514.50	181,444
July. 2000	10	3.07	398.9	3,054.73	105,272
July. 2000	11	3.32	580.0	2,365.77	118,546
July. 2000	12	3.09	411.3	1,688.23	59,993
July. 2000	13	2.95	330.8	2,310.33	66,039
July. 2000	14	3.02	369.2	3,064.20	97,741
July. 2000	15	3.25	523.3	3,884.03	175,605
July. 2000	16	3.24	515.6	2,716.43	121,010
July. 2000	17	3.08	405.0	2,025.23	70,874
July. 2000	18	2.87	291.2	2,026.40	50,991
July. 2000	19	2.87	291.2	1,714.37	43,139
July. 2000	20	3.35	605.8	10,626.80	556,235
July. 2000	21	2.82	268.6	1,470.90	34,138
July. 2000	22	2.98	346.8	1,327.00	39,765
July. 2000	23	2.68	213.1	1,385.53	25,513
July. 2000	24	3.52	771.8	11,282.23	752,374
July. 2000	25	3.26	531.1	6,427.87	294,945
July. 2000	26	2.86	286.6	1,538.00	38,083
July. 2000	27	2.98	346.8	4,954.07	148,455
July. 2000	28	2.99	352.3	3,626.67	110,394
July. 2000	29	2.99	352.3	4,220.47	128,469
July. 2000	30	2.87	291.2	1,860.60	46,819
July. 2000	31	3.29	555.1	4,840.47	232,135
Aug. 2000	1	3.33	588.5	3,724.63	189,376
Aug. 2000	2	3.25	523.3	4,575.20	206,854
Aug. 2000	3	3.35	605.8	3,787.33	198,239
Aug. 2000	4	3.15	450.6	2,707.47	105,407
Aug. 2000	5	3.13	437.2	1,842.83	69,604
Aug. 2000	6	3.18	471.4	1,647.63	67,111
Aug. 2000	7	3.25	523.3	2,707.70	122,421
Aug. 2000	8	3.07	398.9	2,253.77	77,669
Aug. 2000	9	3.04	380.8	2,170.80	71,426
Aug. 2000	14	2.85	282.0	947.00	23,074
Aug. 2000	15	3.07	398.9	1,303.53	44,922
Aug. 2000	16	2.83	273.0	1,067.17	25,173
Aug. 2000	17	2.72	227.9	2,329.13	45,855
Aug. 2000	18	2.67	209.6	1,545.47	27,983
Aug. 2000	19	2.73	252.6	4,535.77	98,998
Aug. 2000	25	2.96	331.6	1,765.87	50,595
Aug. 2000	27	2.99	343.2	1,432.10	42,459
Aug. 2000	28	3.53	607.7	3,275.37	171,984
Aug. 2000	29	3.13	401.1	2,283.17	79,117

Month-Year	Date	Gauge Height(m)	River discharge (m3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
Aug. 2000	30	3.36	511.9	2,255.50	99,764
Aug. 2000	31	3.11	392.4	1,209.60	41,007
Sept. 2000	1	3.12	396.7	3,032.20	103,929
Sept. 2000	2	3.22	442.0	5,496.17	209,904
Sept. 2000	3	2.85	291.8	1,732.90	43,689
Sept. 2000	4	3.07	375.4	323.43	10,491
Sept. 2000	5	2.73	252.6	2,141.97	46,751
Sept. 2000	6	2.93	320.4	2,440.23	67,546
Sept. 2000	7	2.88	302.3	4,212.50	110,017
Sept. 2000	8	2.93	320.4	3,986.30	110,341
Sept. 2000	9	3.11	392.4	2,643.87	89,630
Sept. 2000	10	2.67	234.6	1,318.27	26,719
Sept. 2000	11	2.67	234.6	1,189.17	24,103
Sept. 2000	12	2.64	225.9	1,327.43	25,914
Sept. 2000	13	2.57	206.7	681.10	12,165
Sept. 2000	14	2.50	188.8	940.40	15,338
Sept. 2000	15	2.88	302.3	3,947.40	103,094
Sept. 2000	16	2.50	188.8	1,657.03	27,026
Sept. 2000	17	2.50	188.8	8,604.37	140,335
Sept. 2000	18	2.99	343.2	9,566.43	283,628
Sept. 2000	19	3.02	355.0	9,993.37	306,509
Sept. 2000	20	2.82	281.6	2,910.83	70,822
Sept. 2000	21	2.73	252.6	3,181.10	69,431
Sept. 2000	22	2.65	228.8	1,518.67	30,022
Sept. 2000	23	2.53	196.3	1,519.00	25,765
Sept. 2000	24	2.72	249.5	3,734.37	80,514
Sept. 2000	25	2.44	174.3	1,086.57	16,367
Sept. 2000	26	2.35	154.3	1,033.67	13,779
Sept. 2000	27	2.37	158.6	64.87	889
Sept. 2000	28	2.30	143.9	1,145.40	14,243
Sept. 2000	29	2.24	132.2	320.93	3,666
Sept. 2000	30	2.22	128.5	196.73	2,183
Oct.2000	1	2.22	128.5	298.47	3,313
Oct.2000	3	2.12	110.9	209.93	2,012
Oct.2000	5	2.07	102.9	107.40	955
Oct.2000	7	2.03	96.8	110.17	921
Oct.2000	9	2.00	92.4	107.27	856
Oct.2000	11	1.97	88.1	228.30	1,738
Oct.2000	13	1.92	81.4	180.00	1,265
Oct.2000	15	1.88	76.2	119.13	785
Oct.2000	17	1.85	72.6	222.43	1,395
Oct.2000	19	1.81	67.9	85.07	499
Oct.2000	21	1.79	65.6	69.67	395
Oct.2000	23	1.78	64.5	415.67	2,317
Oct.2000	25	1.77	63.4	281.03	1,540
Oct.2000	27	1.74	60.2	159.20	829
Oct.2000	29	1.73	59.2	75.63	387
Oct.2000	31	1.71	57.2	234.20	1,157
Nov. 2000	2	1.70	56.2	52.27	254
Nov. 2000	4	1.64	50.5	158.27	690
Nov. 2000	6	1.66	52.3	32.50	147
Nov. 2000	8	1.63	49.6	89.30	382
Nov. 2000	10	1.62	48.7	26.70	112
Nov. 2000	12	1.57	44.4	54.43	209

Month-Year	Date	Gauge Height(m)	River discharge (m^3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
Nov. 2000	13	1.54	42.0	8.10	29
Nov. 2000	14	1.55	42.8	105.40	389
Nov. 2000	16	1.56	43.6	346.00	1,302
Nov. 2000	18	1.50	38.9	25.50	86
Nov. 2000	20	1.47	36.7	3.90	12
Nov. 2000	22	1.47	36.7	133.40	423
Nov. 2000	24	1.44	34.6	149.40	446
Nov. 2000	26	1.43	33.9	32.00	94
Nov. 2000	28	1.41	32.6	12.50	35
Nov. 2000	30	1.39	31.3	10.70	29
Dec. 2000	2	1.38	30.6	80.60	213
Dec. 2000	3	1.36	29.4	12.30	31
Dec. 2000	4	1.35	28.8	1.70	4
Dec. 2000	6	1.44	34.6	2.90	9
Dec. 2000	8	1.34	28.2	25.10	61

Concentration Measurement of Suspended Sediment at Bhimad Bajar
in Year of 2001

Month-Year	Date	Gauge Height(m)	River discharge (m^3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
June. 2001	26	2.25	135.7	1,969.00	23,087
June. 2001	27	2.11	109.5	1,503.50	14,218
June. 2001	28	2.15	116.5		
June. 2001	29	2.48	188.8	2,752.00	44,903
June. 2001	30	2.52	199.5	2,852.50	49,166
July. 2001	1	2.40	168.9	1,542.50	22,503
July. 2001	2	2.22	129.7	1,174.50	13,164
July. 2001	3	2.35	157.2	1,075.50	14,607
July. 2001	4	2.24	133.7	1,532.00	17,696
July. 2001	5	2.34	154.9	566.00	7,577
July. 2001	6	2.12	111.2	869.00	8,348
July. 2001	7	2.17	120.2	1,626.50	16,889
July. 2001	8	2.10	107.7	962.50	8,959
July. 2001	9	2.05	99.5	541.50	4,653
July. 2001	10	2.33	152.7	5,046.00	66,575
July. 2001	11	2.62	228.1	4,237.50	83,507
July. 2001	12	2.35	157.2	1,377.00	18,702
July. 2001	13	2.22	129.7	1,167.50	13,085
July. 2001	14	2.25	135.7	1,464.00	17,166
July. 2001	15	2.93	336.7	4,351.50	126,573
July. 2001	16	3.49	626.5	5,235.50	283,412
July. 2001	17	3.17	444.5	2,024.50	77,747
July. 2001	18	2.69	249.9	680.00	14,680
July. 2001	19	2.62	228.1	1,430.00	28,181
July. 2001	20	2.71	256.4	1,279.00	28,331
July. 2001	21	2.58	216.3	595.00	11,120
July. 2001	22	2.86	309.3	2,429.00	64,913
July. 2001	23	2.59	219.2	1,318.00	24,962
July. 2001	24	2.42	173.7	1,298.00	19,479
July. 2001	25	2.77	276.7	5,040.50	120,481
July. 2001	26	2.69	249.9	1,105.50	23,866
July. 2001	27	2.61	225.1	1,378.50	26,809
July. 2001	28	2.65	237.2	1,746.00	35,789
July. 2001	29	3.61	707.6	4,519.00	276,270
July. 2001	30	3.46	607.4	1,404.50	73,710
July. 2001	31	3.13	424.9	2,253.50	82,732
August. 2001	1	3.18	449.5	1,486.50	57,728
August. 2001	2	3.48	620.1	1,408.00	75,438
August. 2001	3	3.16	439.5	3,529.00	134,015
August. 2001	4	2.91	328.7	1,179.00	33,480
August. 2001	5	2.88	316.9	1,228.00	33,628
August. 2001	6	2.64	234.2	1,322.50	26,756
August. 2001	7	2.49	191.5	2,371.00	39,223
August. 2001	8	2.63	231.1	3,062.00	61,141
August. 2001	9	2.53	202.2	1,806.50	31,563
August. 2001	10	2.64	234.2	3,733.50	75,533
August. 2001	11	2.43	176.2	1,814.00	27,608
August. 2001	12	2.56	210.6	2,484.50	45,204
August. 2001	13	2.71	256.4	2,668.00	59,098
August. 2001	14	2.46	183.7	1,610.00	25,552

Month-Year	Date	Gauge Height(m)	River discharge (m^3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
August. 2001	15	2.46	183.7	2,975.50	47,224
August. 2001	16	2.78	280.1	4,782.00	115,746
August. 2001	17	2.58	216.3	3,218.50	60,149
August. 2001	18	3.95	980.5	9,238.00	782,597
August. 2001	19	3.91	944.8	4,217.00	344,249
August. 2001	20	3.33	529.6	5,179.00	236,988
August. 2001	21	3.43	588.7	4,960.50	252,330
August. 2001	23	4.48	1,555.7	5,798.50	779,398
August. 2001	24	4.35	1,395.8	6,828.00	823,415
August. 2001	25	4.36	1,407.6	4,292.00	521,980
August. 2001	26	3.31	518.4	5,197.50	232,775
August. 2001	27	3.48	620.1	6,749.50	361,624
August. 2001	28	4	1,026.5	4,860.50	431,075
August. 2001	29	3.45	601.1	7,760.25	403,061
August. 2001	30	3.07	396.8	3,089.00	105,901
August. 2001	31	2.96	348.9	3,759.50	113,337
Sept. 2001	1	3.05	388.8	7,583.00	254,730
Sept. 2001	2	3.29	503.0	1,825.50	79,338
Sept. 2001	3	2.82	299.3	1,845.50	47,724
Sept. 2001	4	2.62	235.3	2,953.50	60,039
Sept. 2001	5	2.34	164.1	5,510.00	78,119
Sept. 2001	6	2.86	313.6	1,930.00	52,290
Sept. 2001	7	3.01	371.9	3,575.00	114,876
Sept. 2001	8	2.82	299.3	2,108.00	54,512
Sept. 2001	9	3.05	388.8	3,509.50	117,892
Sept. 2001	10	2.87	317.2	2,416.50	66,234
Sept. 2001	11	3.12	419.8	3,641.00	132,056
Sept. 2001	12	2.83	302.8	2,034.00	53,217
Sept. 2001	13	2.78	285.5	2,032.50	50,141
Sept. 2001	14	3.06	393.1	5,591.50	189,915
Sept. 2001	15	2.67	250.2	1,864.50	40,302
Sept. 2001	16	2.62	235.3	2,270.00	46,145
Sept. 2001	17	2.42	182.4	1,420.00	22,382
Sept. 2001	18	2.42	182.4	1,634.50	25,764
Sept. 2001	19	2.38	173.1	1,120.50	16,756
Sept. 2001	20	2.21	137.4	1,265.50	15,020
Sept. 2001	21	2.21	137.4	1,373.50	16,302
Sept. 2001	22	2.24	143.2		
Sept. 2001	23	2.22	139.3	1,896.00	22,819
Sept. 2001	24	2.4	177.7	2,874.50	44,135
Sept. 2001	25	2.34	164.1	2,197.50	31,155
Sept. 2001	26	2.22	139.3	1,344.50	16,182
Sept. 2001	27	2.23	141.2		
Sept. 2001	28	2.18	131.7	393.50	4,478

Concentration Measurement of Suspended Sediment at Bhimad Bajar
in Year of 2004

Date-Month-Year		River discharge (m^3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
3-Jul-04		376.7	4,510.97	146,811
4-Jul-04		262.1	6,945.72	157,272
5-Jul-04		291.1	6,754.30	169,884
6-Jul-04		385.7	5,633.10	187,719
7-Jul-04		NA	4,342.08	N.A.
8-Jul-04		388.0	5,738.92	192,370
9-Jul-04		311.3	6,705.35	180,332
10-Jul-04		298.1	3,555.96	91,585
11-Jul-04		391.4	5,747.64	194,359
12-Jul-04		469.7	3,220.65	130,689
13-Jul-04		646.4	11,912.28	665,291
14-Jul-04		338.4	2,426.44	70,950
15-Jul-04		394.8	5,212.12	177,795
16-Jul-04		460.9	8,318.34	331,232
17-Jul-04		469.7	4,956.85	201,142
18-Jul-04		553.7	8,120.83	388,493
19-Jul-04		563.2	7,662.20	372,827
20-Jul-04		381.2	1,807.10	59,515
21-Jul-04		486.5	2,882.69	121,181
22-Jul-04		490.1	2,612.06	110,613
23-Jul-04		382.3	3,013.69	99,546
24-Jul-04		421.6	3,733.42	135,989
25-Jul-04		435.9	2,747.14	103,457
26-Jul-04		386.8	1,702.83	56,912
27-Jul-04		450.4	3,157.78	122,884
28-Jul-04		397.1	1,551.94	53,247
29-Jul-04		377.8	1,557.07	50,826
30-Jul-04		345.9	1,219.81	36,457
31-Jul-04		392.5	3,786.85	128,428
1-Aug-04		364.5	2,007.66	63,218
2-Aug-04		383.4	2,474.04	81,962
3-Aug-04		333.1	1,916.99	55,174
4-Aug-04		296.1	1,078.89	27,600
5-Aug-04		327.9	1,058.82	29,993
6-Aug-04		279.3	2,670.10	64,439
7-Aug-04		269.7	1,333.32	31,066
8-Aug-04		341.6	6,653.35	196,387
9-Aug-04		339.5	10,968.22	321,724
10-Aug-04		339.5	2,351.80	68,984
11-Aug-04		N.A.	1,600.61	N.A.
12-Aug-04		311.3	2,809.37	75,554
13-Aug-04		276.4	2,075.61	49,570
14-Aug-04		282.2	2,956.41	72,096
15-Aug-04		295.1	1,909.71	48,690
16-Aug-04		292.1	6,380.95	161,041
17-Aug-04		NA	1,594.31	N.A.
18-Aug-04		NA	2,139.36	N.A.
19-Aug-04		NA	5,615.86	N.A.
20-Aug-04		NA	7,035.59	N.A.
21-Aug-04		NA	3,715.66	N.A.

Date-Month-Year		River discharge (m3/s)	Suspended Load Concentration (ppm)	Suspended Load in Weight (ton/day)
22-Aug-04		NA	3,030.19	N.A.
23-Aug-04		NA	4,606.84	N.A.
24-Aug-04		NA	1,729.03	N.A.
25-Aug-04		NA	1,030.66	N.A.
26-Aug-04		NA	4,152.90	N.A.
27-Aug-04		NA	3,758.50	N.A.
28-Aug-04		NA	4,475.35	N.A.
29-Aug-04		NA	4,956.87	N.A.
30-Aug-04		NA	3,014.80	N.A.
31-Aug-04		NA	2,280.06	N.A.
1-Sep-04		435.9	1,138.33	42,869
2-Sep-04		520.1	4,173.81	187,567
3-Sep-04		526.6	2,606.08	118,569
4-Sep-04		496.4	2,367.52	101,547
5-Sep-04		389.1	1,272.00	42,763
6-Sep-04		N.A.	N.A.	N.A.
7-Sep-04		360.1	N.A.	N.A.
8-Sep-04		341.6	N.A.	N.A.
9-Sep-04		488.3	N.A.	N.A.
10-Sep-04		476.7	N.A.	N.A.
11-Sep-04		267.8	N.A.	N.A.
12-Sep-04		472.3	N.A.	N.A.
13-Sep-04		409.8	N.A.	N.A.
14-Sep-04		498.2	N.A.	N.A.
15-Sep-04		483.0	N.A.	N.A.
16-Sep-04		375.6	N.A.	N.A.
17-Sep-04		370.0	N.A.	N.A.
18-Sep-04		348.1	1,362.37	40,972
19-Sep-04		N.A.	650.00	N.A.
20-Sep-04		308.2	1,116.54	29,732
21-Sep-04		281.3	799.38	19,426
22-Sep-04		264.9	628.46	14,384
23-Sep-04		249.0	758.91	16,328
24-Sep-04		267.8	1,198.02	27,716
25-Sep-04		267.8	862.37	19,951
26-Sep-04		296.1	4,235.12	108,344
27-Sep-04		214.3	603.70	11,179
28-Sep-04		259.2	328.10	7,349
29-Sep-04		250.9	540.10	11,706
30-Sep-04		258.3	300.45	6,705
1-Oct-04		353.5	2,745.67	83,859
2-Oct-04		254.6	874.07	19,225
3-Oct-04		293.1	1,085.33	27,484
4-Oct-04		235.4	326.65	6,643
5-Oct-04		284.2	767.05	18,835
6-Oct-04		231.8	397.47	7,960
7-Oct-04		259.2	1,092.66	24,474

CHAPTER 7 GEOLOGY

CHAPTER 7 GEOLOGY

Geologic Logs Of The Drilled Core

B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, BP-1, BH-1, BH-2, BH-3, BH-4, BH-5, BH-6

Photograph Of The Drilled Core

B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, BP-1, BH-1, BH-2, BH-3, BH-4, BH-5, BH-6

Water Level In The Hole During Drilling

B-1, B-2, B-4, B-8, B-9, B-12, BP-1, BH-1, BH-2, BH-3, BH-4, BH-5, BH-6

Geologic Loge Of The drilled Core

B-1, B-2, B-3, B-4, B-5, B-6, B-7, B-8, B-9, B-10, B-11, B-12, BP-1, BH-1, BH-2, BH-3, BH-4, BH-5, BH-6

BORE HOLE LOG

SHEET 1/15

DRILL HOLE NO.: B-1
COORDINATES: X: 3092828.494 Y: 525298.847 Z: 515.10
INCLINATION: Vertical DIRECTION:
DRILLING MACHINE: Long Year CASING DEPTH : HW: 2.25 m; NW: 7.35 m
DRILLING METHOD: Rotary Drilling / Wire line System WATER TABLE: None

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core Rec. / RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Coreloss														
1.00																	
	1.05		Overburden materials														
2.00																	
	2.50		Top of the bedrock at 2.50 m														
	2.70			>20			R,ir	cl	100	0							
3.00			Dolomite with quartz veins	14	SW	60°,20°	R,ir,pl	calc,cl	100	14				CM	2	3	3 ~ 4
	3.50		Grey, fine grained, medium hard to hard	8	SW	30°	R,ir	calc,cl	100	0							
4.00	4.00		In several runs low core recovery is observed that is due to mechanical grinding with in weathered section, fractured zones and closely spaced joints.	20	SW	60°	R,ir	calc,cl	100	0							
	4.50			20	SW	60°	R,ir,pl	calc	100	0							
	4.75				SW	60°	R,ir,pl	Calc FeO	100	0							
5.00	5.00			14	F	70°	R,ir	cl	100	22				CH	2	2	3
	5.50		MB and fractrured zones are observed between 2.50 m to 2.70 m 7.45 m to 7.50 m 9.00 m to 9.30 m														
6.00				>20	F	40°	R,pl	calc,cl	25	0				CM	2	3	4
	6.70		Colreloss is observed between 5.50 m to 6.35 m														
7.00				9	F	30°,40° 70°	R,pl	Calc FeO	100	60							
	7.45		Calcite leached on the joint surface between 2.70 m to 3.50 m														
	8.00			14	SW	40°,75°	R,ir	cl	100	18							
8.00																	
			Slightly perforated on surface of the core, clay content on those perforations between 6.70 m to 7.45 m	7	F	50°,40°	R,ir,pl	Calc FeO	100	65							
9.00	8.85													CH	2	2	3
				11	F	40°	R,pl	calc	100	15							
	9.50																
10.00				11	F	50°,80°	R,pl	FeO	100	50							

ABBREVIATIONS:F- Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilshina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 2/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing	
			Dolomite with quartz vein Grey, fine grained, mod. hard to hard															
	10.65																	
11.00			Mechanical breaks are from 15.25 m - 15.40 m	9	F	50°,70°	R,pl	FeO	100	48				CH	2	2	3	11
12.00																		12
	12.25																	
13.00				3	F	50°,60°	R,ir	calc	100	77				B	1 ≀ 2	2	2	13
	13.80																	
14.00				10	F	30°,50° 70°	R,ir,pl	calc	100	47				CH	1 ≀ 2	2	3	14
15.00	15.00		Iron stained on the joint surface	>20	F	40°,70°	R,ir	calc	100	0							4	15
	15.40																	
16.00			Perforations on the surface where leaching of calcite is observed. Highly fractured, grains separates when hit	6	SW	50°,70°	R,ir	calc	100	54				CM	2	3	2 ≀ 3	16
17.00	17.00																	17
	17.60			>20	F	50°,70°	R,ir	cl	100	0				CM	2	3	3 ≀ 4	
18.00				3	F	50°	R,pl		100	63								18
	19.35																	
19.00			Perforations due to chemical reaction in calcite layers. Clay present in those perforations Cracks are developed due to the chemical reaction.	10	SW	60°,40° 70°	R,ir,pl	calc,cl	100	61				CH	2	2	2 ≀ 3	19
20.00	20.00																	20

Lugeon Value 1.35

Lugeon Value 8.8

ABBREVIATIONS: F-Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered

MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular, FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 3/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
21.00			**Dolomite with quartz vein** Grey, fine grained, mod. hard Perforations are present on the surface of the cores between 20.00 m - 21.50 m 25.00 m - 26.45 m 28.10 m - 30 m Calcite is present on the perforations red soil on the surface of the cores	11	SW	40°,70°	R,ir	calc	100	50		Lugeon Value 28.9					
	21.50																
22.00				11	F	60°,70°	R,ir,pl	calc,cl FeO	100	36				CH	2	2	3
23.00																	
	23.15																
24.00				14	F	40°,70°	Sm-r pl-ir	calc,cl	100	26				CM	2	2	3 ≀ 4
	24.30																
25.00	25.00			6	F	40°,70°	R,pl	FeO	100	70				B	2	2	2
26.00				8	F	50°,40° 70°	R,ir,pl	calc,cl	100	41		Lugeon Value 2.7					
	26.45																
27.00				8	F	20°,40° 70°	Sm-r pl	calc,cl	100	39				CH	1	2	3
28.00																	
	28.10																
29.00				9	F	50°,70°	R,ir,pl	calc,cl FeO	100	36							
	29.60																
30.00	30.00			12	F	60°	R,pl	calc	100	0							

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilshina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 4/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Dolomite with quartz vein Light grey, fine grained, mod. hard, calcite leached, perforated														
31.00			In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.	11	SW	20°,40° 60°	R,ir	calc FeO	100	15							
	31.30																
				10	SW	40°	R,ir	FeO	100	33				CH	2	2	3
32.00	32.00																
				20	F	60°	R,ir	FeO	100	24							
	32.50		Mechanical breaks are observed from														
33.00			31.10 m to 31.40 m 33.75 m to 34.00 m 34.15 m to 34.35 m 34.85 m to 35.00 m 36.60 m to 37.00 m 37.80 m to 38.00 m	>20	F	50°,70°	R,ir	calc	100	0		Lugeon Value 1.7			2	2 ≀ 3	3 ≀ 4
															2	3	4
34.00	34.00																
				10-15	F	40°	R,ir	none	100	30						2 ≀ 3	3 ≀ 4
			Red soil on the surface of the cores from 32.50 m to 35.00 m														
35.00	35.00			12-20	F	60°	R,ir	none	100	20							
	35.50																
36.00				7-12	F	60°,70°	R,ir,pl	calc FeO	100	0				CM	2	3	4
37.00	37.00																
				10-14	F	50°	R,ir,pl	none	100	0							
38.00																	
	38.50																
39.00				14-17	F	50°	R,ir	none	100	0							
40.00	40.00																

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 5/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
41.00	41.30	**Dolomite with quartz vein** Grey, fine grained, med. Hard to hard. In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.	11-13	F	50°,60°	R,ir	calc	100	39	Lugeon Value 23.9					
42.00			7-12	F	60°,40° 70°	R,ir,pl	calc,cl FeO	100	15			CH	2	2	3
43.00	43.00	Mechanical breaks are observed from 43.20 m to 43.30 m, 45.18 m to 45.25 m, 46.00 m to 47.00 m, 49.70 m to 50.00 m	12	F	60°,40° 70°	R,ir,pl	FeO,cl	100	0			CM	2 ≀ 3	3	3 ≀ 4
44.00	44.20	MW cores from 44.70 m to 44.75 m rock is obtained in the form of powder	12-19	F-sw	50°,70°	R,ir,pl	FeO	100	0						
45.00	45.00	Few perforations on the surface of the cores	10-20	F-sw	50°	R,pl	none	100	20			CH	2	2	3
46.00	45.50		4	F	40°,70°	R,pl	calc FeO	100	17			CM	2	3	4
47.00	47.00		10	F	20°,40° 70°	R,ir,pl	calc FeO	100	36			CH	2	2	3
48.00												B	2	2	2
49.00	48.65	Red soil on the surface of the cores	4	F-sw	40°,70°	R,ir,pl	calc,cl FeO	100	52			CM	2 ≀ 3	3	3 ≀ 4
50.00	50.00														

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilshina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 6/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	12	SW	60°	Sm-r pl	FeO	100	44							
	50.50															
51.00		In several runs low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with	8	F-sw	60°,30°	Sm-r lr	FeO	100	20					2	2 ≀ 3	3 ≀ 4
52.00	52.00	in highly weathered section, fractured zones and closely spaced joints.	>20	F-sw		R,pl	calc FeO	100	0					2	3	4
	52.40															
53.00		The actual depth of lost zones could not be traced because of its broken nature.	15-20	F	60°	R,pl	FeO,cl	82	0		Lugeon Value 16.21		CM	2	3	4
	53.50															
54.00	54.00	Mechanical breaks are observed from 52.00 m to 52.40 m	>20	F	60°	R,ir	FeO,cl	70	0					2	3	3 ≀ 4
		52.60 m to 52.80 m 53.80 m to 54.00 m 54.25 m to 54.50 m 54.85 m to 55.00 m	10	F-sw	60°,70°	R,ir	calc,cl	75	0					2	3	4
55.00	55.00	55.00 m to 55.20 m 55.55 m to 55.75 m														
		58.25 m to 58.35 m 58.50 m to 58.60 m 59.10 m to 59.20 m	19	F	30°,60° 70°	R,ir	FeO	100	0					2	3	3 ≀ 4
56.00	56.00	59.70 m to 59.75 m														
		Coreloss is observed from 52.40 m to 52.60 m 53.50 m to 53.65 m 54.00 m to 54.25 m	4	F	40°,30°	R,ir,pl	FeO	100	67		Lugeon Value 2.23					
57.00		HW cores is present between 53.65 m to 53.70 m											CH	2	2	3
	57.50															
58.00			5	F	40°	R,ir,pl	calc FeO	100	43							
59.00	59.00															
			5	F	60°,50°	R,ir	FeO	100	20				CM	2	3	3 ≀ 4
60.00	60.00															

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 7/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core Rec. / RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Dolomite with quartz vein Grey, fine grained, med. Hard to hard	8	F	60°	R,pl	none	100	46				CH	1	2	3
	60.65		Red soil on the surface of the cores														
61.00				4	F	60°,40° 70°	R,ir,pl	calc	100	72							
			In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.														
62.00				2	F	60°	R,ir	calc	100	90							
	62.25																
63.00			Mechanical breaks are observed from 60.50 m to 60.65 m 68.80 m to 69.00 m														
	63.75																
64.00				3	F	50°,40° 80°	R,pl	calc FeO	100	87				B	1	2	2
65.00																	
	65.30																
66.00				7	F	50°,60° 70°,80°	R,pl	calc	100	62							
67.00	66.90																
				8	F	60°,70°	R,pl	calc	100	60							
68.00																	
	68.15			4-7	F	60°,70°	R,pl	none	100	20				CH	1	2	3
	68.65													CM	1	2	3 ≀ 4
69.00				20	F	60°,50°	R,pl	calc	100	7							
														CH	1	2	3
70.00	70.00																

Lugeon Value 1.17

Lugeon Value 1.0

61 62 63 64 65 66 67 68 69 70

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 8/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	5-7	F	50°,70°	R,ir,pl	none	100	57				B	1	2	2
71.00		Red soil on the surface of cores														
		In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely														
	71.50															
72.00		spaced joints.	8-10	F	60°,40° 70°	R,ir,pl	calc	100	50				CH	2	2	3
		Mechanical breaks are observed from														
73.00	73.00	74.90 m to 75.40 m														
		75.65 m to 77.00 m														
		77.80 m to 78.00 m	8-10	F	25°,50° 60°	R,pl	calc FeO	100	60		Lugeon Value 1.7					2 ~ 3
74.00		Highly fragmented dolomite but fragments are cemented between 71.50 m to 73.00 m												2	2	
	74.50															
			12	F	50°,70°	R,pl	FeO	100	40					2	2	3
75.00	75.00		15	F	40°	R,ir	none	100	21				CM	2	3	4
	75.65															
76.00	76.00		>20	F	50°	R,ir	none	100	0							
			10-15	F	60°	R,pl	none	100	0							
77.00	77.00															
			7-10	F	60°,40°	R,pl	none	100	21		Lugeon Value 1.49					3
78.00																3~4
	78.50												CH	2	2	3
79.00			10-14	F	60°	R,pl	none	100	29				CM	2	2	3~4
													CH	2	2	3
80.00	80.00															

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilshina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 9/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	15-20	F	30°	R,ir	none	100	69			CH	2	2	3
81.00	81.00	Few porforations and cracks developed due to chemical reactions and calcite leaching is prominent	>20	F		R,ir	none	100	0			CM	2	3	4
	81.45		4	F	40°	R,ir	none	100	18			CH	2	2	3
82.00		In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.	8	SW	60°,20°	R,ir	calc FeO	100	28			CM	2	3	3
	82.65		8	F	50°,40° 75°	R,ir	calc FeO	100	47			CH	2	2	3
83.00	83.00	Mechanical breaks are observed from 80.80 m to 80.90 m 81.00 m to 82.50 m 88.70 m to 88.80 m	5	F	50°,60° 70°	R,ir,pl	calc	100	93						
84.00		Highly weathered cores are observed from 88.50 m to 88.70 m	8	F	40°	R,pl	calc	100	86						
	84.20	Fragmented grains of dolomite but those grains are cemented from 82.65 m to 83.00 m	6	F	50°,70°	R,ir,pl	calc FeO	100	60			B	1 ~ 2	2	2
85.00	85.00		8	F	40°	R,pl	calc	100	86						
	85.70									Lugeon Value 1.67					
86.00															
87.00															
	87.30									Lugeon Value 1.04					
88.00			7	F	40°,70°	R,ir,pl	calc,cl FeO	100	60						
	88.80														
89.00			7.5	F	60°,40°	R,ir,pl	FeO,cl	100	46			CH	2	2	3
90.00	90.00														

Core: Rec. / RQD; 20 40 60 80 100

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 10/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	9	F	50°,40° 60°	R,ir,pl	calc	100	40		Lugeon Value 11.7		CH	2	2	3
91.00		In several runs cores are broken into small fragments due to mechanical grinding with in														
	91.50	fractured zones and closely	1	F	20°	R,pl	calc FeO	100	50							
	91.70	spaced joints.														
92.00			9	F	45°,70°	R,pl	calc	100	36					2	2	3
		Mechanical breaks are														
	92.80	observed from														
93.00			3	F	60°	R,ir	calc FeO	100	0				CM	2	3	4
		93.00 m to 93.30 m														
	93.30	96.10 m to 96.20 m														
		99.75 m to 100.00 m														
94.00		Highly perforated cores are	10	F-MW	50°,60° 70°	R,ir,pl	calc FeO	100	38				CH	2	2	3
		observed from														
		94.40 m to 94.75 m														
		Calcite leaching is observed														
	94.75	in those pores														
95.00	95.00		12	SW	60°	R,pl	calc,FeO	100	0							
	95.20		15	F	60°,40°	R,pl	none	100	50		Lugeon Value 0.57					
		Clay on the surface of the cores														
		from														
		97.85 m to 100.00 m	4	F	40°	R,ir	none	100	48				B	2	2	2
96.00																
	96.30												CM	2	3	3~4
	96.50		10	F	60°	R,ir	FeO	100	50							
97.00			6	F	60°,40° 70°	R,ir,pl	none	100	44				CH	2	2	3
98.00	97.85															
			8	F	20°,40° 60°	R,pl	none	100	60				B	1	2	2
99.00																
	99.25															
			14	F	60°,70°	R,pl	none	100	18				CM	2	3	3 ≀ 4
100.00	100.00															

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 11/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Dolomite with quartz vein Grey, fine grained, med. Hard to hard	10-15	F				17	0							
	100.60																
101.00				15	F	60°,70°	R,pl	calc FeO	100	39				CH	2	2	3
			100.00 m to 100.60 m low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.														
102.00	102.00			5	F	30°,40° 50°,70°	R,ir,pl	calc FeO	100	73				B	2	2	2
103.00			The actual depth of lost zones could not be traced because of its broken nature.														
	103.40																
	103.80		Mechanical breaks are observed from	7	F	30°,40° 45°	R,pl	calc FeO	100	75							
104.00					F	30°,40° 50°	R,ir,pl	calc FeO	100	50					2	2	2 ≀ 3
			100.00 m to 100.10 m 101.65 m to 102.15 m 106.70 m to 107.00 m 107.45 m to 107.60 m 108.00 m to 109.00 m 109.35 m to 109.45 m											CH			
105.00	105.00			11	F	40°	R,pl	calc FeO	100	47					2	2	3
106.00			Coreloss is observed due to 100.10 m to 100.60 m														
	106.30			12	F	40°	R,pl	calc	100	37							
	106.70																
107.00	107.00			10	F	40°	R,pl	none	100	0				CM	2	2	4
				6	F	40°	R,ir,pl	calc FeO	100	25				CH	2	2	3
108.00																	
	108.30			10	F	40°	R,ir,pl	FeO	100	11					2	3	4
109.00														CM			
	109.35			14	F	40°	R,pl	none	100	0						2 ≀ 3	3 ≀ 4
	109.70																
110.00																	

Lugeon Value 4.49

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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 12/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	12	F	30°	R,pl	FeO	100	36						
	110.80														
111.00		In several runs cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.	12	F	60°,50°	R,pl	calc	100	34						
112.00												CH	1 ~ 2	2	3
	112.40														
		Mechanical breaks are observed from	13	F	40°,60°	R,ir,pl	calc FeO	100	18						
113.00		114.15 m to 115.55 m 117.40 m to 117.60 m 118.50 m to 120.00 m													
	113.50		15	F	60°	R,ir	none	100	20						3 ~ 4
114.00														2	
	114.15		>20	F	60°	R,pl	FeO	100	0			CM	1 ~ 2		
	114.50													3	4
115.00			>20	F	40°,60°	R,ir	none	100	0						
	115.55														
116.00			14	F	40°,50°	R,ir,pl	calc FeO	100	36						
	116.65														
117.00	117.00		11	F	40°,50°	R,pl	calc	100	34			CH	1 ~ 2	2	3
			13	F	60°,50°	R,ir	none	100	13						
118.00															
	118.50											CM	2	3	4
119.00			>20	F		R	FeO	100	0			CL	2	3	4 ~ 5
	119.15		>20	F	70°	R	FeO	100	0			CM	2	3	4
	119.55														
120.00	120.00		10-20	F	50°	R	calc FeO	100	44			CH	1~2	2	3

Lugeon Value 1.76

ABBREVIATIONS: F-Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered
MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular, FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilshina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 13/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	12	F	40°,50°	R,ir	calc FeO	100	30							
121.00	121.20	In 123.50 m to 123.90 m low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with in,fractured zones and closely spaced joints.	7	F	40°	R,pl	FeO	100	34				CH	1 ≀ 2	2	3
122.00	122.30		20	F	40°	R,pl	none	100	14							
123.00	123.00	The actual depth of lost zones could not be traced because of its broken nature.	>20	F	40°,50°	R,pl	none	100	0							
	123.50	Mechanical breaks are observed from														
124.00		121.20 m to 121.40 m 122.00 m to 122.12 m 122.00 m to 122.80 m 123.10 m to 123.30 m 123.90 m to 125.20 m 125.00 m to 127.25 m 128.10 m to 128.25 m 129.60 m to 129.68 m	>20	F	40°	R,ir,pl	none	73	0				CM	1 ≀ 2	2 ≀ 3	4
125.00	125.00		>20	F	40°,60°	R,ir,pl	FeO	100	0		Lugeon Value 0.84					
126.00		Coreloss is observed due to 123.50 m to 123.90 m														
	126.50		>20	F			FeO	100	0				CL	2 ≀ 3	3	4 ≀ 5
127.00	127.25		16	F	40°,60°	R,pl	none	100	19				CH	1 ≀ 2	2	3
128.00	128.00		17	F	40°	R,pl	calc	100	53							
129.00																
	129.60		7	F	50°	R,pl	calc	100	70				B	1 ≀ 2	2	2
130.00	130.00															

121 122 123 124 125 126 127 128 129 130

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 14/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz vein Grey, fine grained, med. Hard to hard	>20	F	0°,05° 50°	R,ir,pl	none	100	0			CH	2	3	4
131.00	131.00													2	3
		In 123.50 m to 123.90 m low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with in,fractured zones and closely spaced joints.	12	F	40°,50°	R,ir,pl	none	100	10			CM	2	2 ≀ 3	3 ≀ 4
132.00	132.00		>20	F		R	none	31	0						
	132.80	The actual depth of lost zones could not be traced because of its broken nature.										CM	3	3	4
133.00			12	F	40°,50°	R,pl	none	100	54			B	2	2	2
		Mechanical breaks are observed from 130.00 m to 130.45 m													
134.00	134.00	131.00 m to 131.28 m	9	F	60°,70°	R,pl	cl	100	39						
		131.80 m to 132.00 m													
		132.55 m to 132.80 m										CH	2	2	3
		136.00 m to 136.08 m													
135.00		136.35 m to 136.50 m													
		137.40 m to 137.50 m													
	135.60														
136.00			5	F	60°	R,ir	none	47	16						
		Coreloss is observed from 132.00 m to 132.55 m													
	136.35													2	3
		135.60 m to 136.00 m	11	F	40°	R,ir	none	100	0			CM	2	≀ 3	≀ 4
	136.80	138.60 m to 139.00 m													
137.00		139.00 m to 140.00 m													
			7	F	40°,50°	R,ir,pl	FeO,cl	100	52						
												CH	2	2	3
138.00	138.00														
		Between this run there is a cave or void of 60 cm height.						0	0						
	138.60														
								0	0						
139.00	139.00														
								0	0						
	139.50														
								0	0						
140.00	140.00														

131 132 133 134 135 136 137 138 139 140

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 15/15

DRILL HOLE NO.: B-1 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
141.00			**Dolomite with quartz vein** Grey, fine grained, med. Hard to hard	7	F	30°,50° 60°	R,ir,pl	none	100	6			CM	1	2	4
	141.50		In several runs low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with in fractured zones and closely spaced joints.													
142.00				>20	F			none	33	0						
			The actual depth of lost zones could not be traced because of its broken nature.										D	2	3 ≀ 4	5
143.00	143.00			>20	F			none	57	0			CM	2 ≀ 3	3	4
	143.70		Mechanical breaks are observed from													
144.00			141.00 m to 141.10 m 141.28 m to 141.80 m 142.18 m to 142.26 m 142.50 m to 143.00 m 143.30 m to 143.60 m 143.70 m to 143.90 m 145.40 m to 145.50 m 145.90 m to 146.00 m 146.10 m to 146.25 m 147.00 m to 147.20 m 147.50 m to 147.70 m 148.40 m to 150.00 m	7	F	40°	R,ir,pl	FeO	100	36						
	144.80															
145.00																
				6	F	40°,70°	R,ir,pl	FeO,cl	100	71			CH	2	2	3
146.00																
	146.40															
147.00			Coreloss is observed from 141.50 m to 142.50 m 143.00 m to 143.30 m 147.90 m to 148.40 m	3	F	10°,50° 60°	R,ir	none	100	48						
148.00	147.90												CM	2	3	4
				>20	F		R,ir	none	50	0						
149.00	148.90			>20	F		R,ir	cl	100	0			CM	2	3	4
	149.60															
150.00	150.00		Hole terminated at 150.00 m	>20	F	60°	R,ir	FeO	100	0						

Lugeon Value 1.6

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
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SRC Lab, NEA Started: 2062.02.17 Completed: 2062.04.18

Drilled by: S.R. Timilsina/T. Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 1/10

DRILL HOLE NO.: B-2
COORDINATES: X: 3092788.59 Y: 525389.56 Z: 515.10
INCLINATION: 45° DIRECTION: 287°
DRILLING MACHINE: Long Year CASING DEPTH : NW: 7.50 m
DRILLING METHOD: Rotary Drilling / Wire line System WATER TABLE: none

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core Rec. / RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Drilled from the bedrock NW casing advancement upto 1 m.						0	0							
1.00	1.00		**Dolomite with quartz veins** Grey, hard, slightly weathered fine grained, perforated,cracked and calcite leached	>20	SW			FeO	25	0							
	1.25							FeO	53	30							
				>20				Calc									
2.00	2.00		In several runs low core recovery is obtained and cores are broken into small fragments due to mechanical grinding with in highly weathered section, fractured zones and closely spaced joints.	>20	SW				10	0				CM	3	3	4
3.00	3.00			>20	SW				70	0							
	3.50		The actual depth of lost zones could not be traced because of its broken nature.	>20	SW		R,pl	FeO,cl	40	0							
4.00	4.00																
			Joint paramenters can't be measured because of smaller fragments.	>20	SW		sm-r pl		45	0							
5.00	5.00																
			Mechanical breaks are observed from 1.00 m to 1.25 m, 2.90 m to 3.00 m, 3.80 m to 4.00 m, 4.55 m to 5.00 m, 5.30 m to 5.50 m, 6.25 m to 6.35 m	10-15	SW	50°	r,pl,ir	FeO,cl	70	0					3	3	3 ≀ 4
6.00	6.00																
				10-15	MW	40°	r,pl,ir	FeO,cl	75	5							
7.00	7.00		Coreloss is observed from 1.25 m to 1.60 m, 2.00 m to 2.90 m, 3.00 m to 3.35 m, 3.50 m to 3.80 m, 4.00 m to 4.55 m, 5.00 m to 5.30 m, 6.25 m to 6.35 m	8	MW	40°,50°	R, ir	FeO,cl	33	10					2 ≀ 3		
	7.50																
8.00				5	SW to MW	50°	R, ir	FeO,cl calc	100	77				CH	2	2	2 ≀ 3
	8.60		4.55 m to 5.00 m, 5.30 m to 5.50 m												2		
9.00			Joints and perforations are filled by red soils between 6.00 m to 7.50 m and 9.60 m to 10.00 m.	7	F-SW	45°,50°	R, ir	calc	100	70							
	9.60		calcite leaching on joints between the run 9.60 m to10.00 m.	13	F-SW	45°-55°	R, ir	FeO Calc	100	33				B	2	2	2
10.00														CM	2~3	3	3

ABBREVIATIONS:F- Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01
Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 2/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
	10.20	**Dolomite with quartz veins** Grey, hard, fresh to slightly weathered fine grained, perforated, cracked and calcite leached.	10	F	50°	R,pl	calc	100	50	Lugeon Value 53.0					
	10.70		9	F-SW	50°	R,pl	FeO	100	82			B	2	2	2
11.00	11.15		14	F-SW	50°	R,pl	FeO,cl	100	69			CH	2	2	3
	11.50		8	F	40°,50°	R,pl		100	52						
12.00	12.00	Perforations and cracks are developed	6	F	40°,50°	R,pl	FeO,cl calc	100	73			B	2	2	2
	12.60	Mechanical breaks are observed from 13.40 m to 13.60 m 14.85 m to 16.30 m 19.70 m to 20.00 m	10	F	45°,50° 75°	R,pl	calc,cl	100	87						
13.00	13.30		6	F	40°	R,pl	calc	100	80			B ≀ CH	2	2	3 2
	13.80		10	F	60°	R,pl	calc	100	37			CH	2	2	3
14.00	14.40		8	F	45°,50°	R,pl	calc	100	47						
15.00	15.00	Joints and cracks are filled by calcite and clay.	8-12	F	40°,25°	r,pl,ir	FeO,cl calc	100	55	Lugeon Value 65.0		B	1 ≀ 2	2	2
16.00	16.00											CM	2	3	4
	16.30		>20	F				100	0						
17.00			6	F	40°,50°	r,pl,ir	FeO Calc	100	62						
	17.50		7	F	40°,60°	R,pl	FeO Calc	100	43			CH	1 ≀ 2	2 ≀ 3	2 ≀ 3
18.00	18.15														
19.00			9	F	40°,50°	R,pl	cl	100	64						
	19.40		5	F	40°	R, ir	calc	100	37						
20.00	20.00											CM	2	3	4

Core: Rec. / RQD; 20 40 60 80 100

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 3/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing	
21.00	21.40		**Dolomite with quartz veins** Grey, hard, fresh, fine grained perforated, cracked and calcite leached	6	F	46°,50°	R, ir	FeO,cl calc	100	61		Lugeon Value 63.0		CH	1 ≀ 2	2	2 ≀ 3	21
22.00	22.00		Highly fragmented cores are obtained between 20.25 m to 20.45 m but these fragments are cemented.	8	F	40°	R, ir	FeO,cl calc	100	40								22
23.00	23.00		Mechanical breaks and fractured zones are observed from 24.20 m to 24.30 m 25.65 m to 25.70 m	4	F	40°-50°	R, ir	FeO,cl calc	100	96								23
24.00	24.40			10	F-SW	40°,60°		FeO Calc	100	50				B	1 ≀ 2	2	2	24
25.00	25.00			10	F-SW	40°	R, ir	FeO	100	57				CH	1 ≀ 2	2	3	25
26.00	25.70			7	F	45°,75°	R, ir	calc,cl	100	71				B	1 ≀ 2	2	2	26
27.00	26.65			8	F	35°,40° 55°	r,pl,ir	FeO,cl calc	100	53		Lugeon Value 55.0		CH	1 ≀ 2	2	3	27
28.00	27.25			10	F	40°	R,pl	calc	100	33								
29.00	28.15		Perforations and cracks are developed on the cores.	7	F	40°	R,pl	FeO Calc	100	50				B	1 ≀ 2	2	2	28
30.00	29.15		Perforations and cracks are developed on dolomite core.	7	F	40°,60° 70°	R,pl st	calc	100	76				CH	1 ≀ 2	2	2 ≀ 3	29
	30.00													B			2	30

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Sl-Silt, calc-calcic

SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 4/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz veins Grey, hard, fresh, fine grained perforated, cracked and calcite leached	6	F	40°,60°	r,pl,ir	FeO Calc	100	59						
31.00	30.85		17	F	40°,50° 60°	r,pl,ir	FeO Calc	100	69			CH	1 ≀ 2	2	2 ≀ 3
32.00	32.30	Perforations are filled by calcite	4	SW	50°	R, ir	FeO Calc	100	96	Lugeon Value 34.0		B	2	2	2
33.00	33.80	Perforated and fractured but the fragments are cemented.	4	SW	50°	r,pl,ir st	FeO,cl	100	65						
34.00	34.45		5	SW	50°	r,pl,st		100	36						3
35.00	35.00		12	SW	40°,50°	r,pl,ir		100	36			CH	2	2 ≀ 3	4 3
36.00	36.25		8	SW	30°,50°	r,pl,ir	calc	100	53						
37.00	37.00	Perforations and cracks are frequent. Highly fractured but the fragments are cemented.	5	MW	50°	r,pl,ir	calc	100	55	Lugeon Value 38.0					
38.00	37.85	Perforations and cracks are developed.	18	MW	40°,50°	r,pl,ir	FeO	100	72			B	1 ≀ 2	2	2
39.00	38.30	MB is observed between 39.80 m to 39.90 m	7	F-SW	50°,75°	r,pl,ir	calc	100	83						4 2
40.00	40.00														

31 32 33 34 35 36 37 38 39 40

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 5/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz veins Grey, hard, fresh, fine grained perforated, cracked and calcite leached	12	F-SW	50°,75°	R, ir	calc	100	33	Lugeon Value 26.0		CH	2	2	3
41.00	40.90	MB is observed from 42.00 m to 42.10 m 46.50 m to 46.55 m 47.85 m to 48.00 m	20	F-SW	50°	r,pl,ir	calc	100	58						
42.00	42.10	CL is observed between 46.35 m to 46.85 m	14	F-SW	40°,50° 20°	R,pl	FeO,cl calc	100	90			B	2	2	2
43.00	43.60	Low core recovery is due to mechanical grinding within fractured zones and closely spaced joints.													
44.00	44.40	The actual depth of lost zones could not be traced because of its broken nature.	10	F	40°,30° 50°	R, ir	FeO Calc	100	29			CH	2	2	3
45.00	45.00		8	F-SW	50°	r,pl,ir	calc	100	55			B	2	2	2
		Iron stained.	6	F-SW	40°,50° 60°	R,pl	FeO Calc	100	85						
46.00	45.65	Calcite leaching on the joint surface of the cores.	8	F-SW	50°	r,pl,ir	FeO calc	100	33			CH	1 ≀ 2	2	3
	46.35	MW - HW fragments of dolomite	10	SW to MW	40°	r,pl,ir	FeO,cl calc	70	0	Lugeon Value 17.0		CM	3	3	3 ≀ 4
47.00	46.85		7	F	40°,50°	r,pl,ir	calc	100	45			CH	1 ≀ 2	2	3
48.00	47.65		10	F	40°,50°	R,pl	calc	100	50						4
	48.15		7	F	20°,50° 60°	R, ir	calc	100	17						3
49.00	48.75	Calcite leaching on the joint surface of the cores making the surface irregular and rough.	9	F	30°,35°	R,pl	FeO Calc	100	75			B	1 ≀ 2	2	2
	49.65	Perforated and leaching on the surface of core.	15	F	30°,50° 60°	r,pl,ir	calc	100	22			CH			3
50.00	50.00														

Core Rec. / RQD: 20, 40, 60, 80, 100

41 42 43 44 45 46 47 48 49 50

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 6/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
51.00			**Dolomite with quartz veins** light grey to grey , hard, fresh, fine grained perforated, cracked and calcite leached. calcite growth on voids fractured but cemented from 50.00 m to 50.30 m.	8	F	40°,50° 60°	R, ir	calc	100	73		Lugeon Value 15.0					
	51.50		Mechanica breaks are observed from 52.35 m to 52.45 m 53.05 m to 53.20 m 56.00 m to 56.10 m 56.80 m to 57.00 m	5	F	50°	R, ir	calc	100	73				B	1 ≀ 2	2	2
52.00	52.05			9	F	45°,50°	R, ir	calc	100	47							
53.00	52.90			10	F			calc	100	50					2	3	4
	53.20																
54.00				9	SW	50°	r,pl,ir	calc	100	86					1 ≀ 2	2	2
	54.60			7	F	50°	R, ir	calc	100	75							2 ≀ 3
55.00	55.00			6	F-SW	60°,50°	R,pl	FeO Calc	100	60		Lugeon Value 14.0					
56.00	56.00			12	F-MW	40°,50°	R, ir	calc	100	39				CH	2	2	3
	56.80																4
57.00				17	F-SW	40°,50°	R, ir	calc	100	19							3
	57.50																
58.00			Clay coating on the surface of the cores.	6	F-SW	40°,50°	R, ir	FeO,cl calc	100	80							
	58.70													B	1 ≀ 2	2	2
59.00				4	F-SW	40°	R, ir		100	55							
	59.15			3	F	50°	r,pl,ir	FeO Calc	100	91							
60.00	60.00																

51 52 53 54 55 56 57 58 59 60

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

MB-Mechanical Break, CL-Coreloss, Pl-Planar, Sm-Smooth, R-Rough, Ir-Irregular,FeO-Iron Oxide, Cl-Clay, Si-Silt, calc-calcic

SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 7/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core Rec. RQD (20 40 60 80 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Dolomite with quartz veins light grey to grey , hard, fresh, fine grained.	6	F	40°	R, ir	calc	100	56				CH	1 ≀ 2	2	3
	60.80		Mechanical break is observed from 60.45 m to 60.55 m														
61.00				5	F	40°	R, ir	calc,cl	100	93							
62.00	62.20																
				6	F	25°,50°	R, ir	calc,cl	100	65							
63.00	63.90																
				10	F	35°	R, ir	FeO	100	40				B	1 ≀ 2	2	2
64.00	64.20																
				5	F	50°	R, ir	cl	100	75							
65.00	65.00																
				8	F	40°,60°	R, ir	FeO	100	47							2 ≀ 3
	65.60																
66.00				7	F	55°,50°	R, ir	FeO,cl	100	39							
67.00	67.20													CH	1 ≀ 2	2	3
				10	F	40°,50°	r,pl,ir	calc	100	54							
68.00																	
	68.30			6	F	40°,50°	sm-r pl-ir	calc	100	80							2 ≀ 3
	68.80																
69.00																	
				6	F	20°,50°	r,pl,ir		100	58					1 ≀ 2	2	
																	3
70.00	70.00																

Lugeon Value 13.0

Lugeon Value 18.0

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered
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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 8/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
	70.40	**Dolomite with quartz veins** light grey to grey , hard, fresh, fine grained.	12	F	40°,50°	R,pl	calc	100	37			CM	1 ≀ 2	2	3 ≀ 4
71.00		Mechanical breaks are observed from 73.75 m to 75.00 m 77.00 m to 77.25 m 79.00 m to 79.10 m 79.40 m to 80.00 m	10	F	30°,50°	R,pl		100	34						71
	71.65														
72.00			4	F	50°	R,pl		100	78	Lugeon Value 5.0		CH	1 ≀ 2	2	2 ≀ 3
	72.15	Maximum size of fragments in MB is 4 cm.	7	F	50°	R,pl	calc	100	69						72
	72.80														
73.00			7	F	50°	sm-r pl	calc	100	63						73
	73.75														
74.00			>20	F				100	0						74
	74.10		>20	F	40°	R,pl		100	29			CM	2	3	4
	74.55		>20	F		R,pl		100	0						75
75.00	75.00			F	40°,50°	R,pl		100	0						
	75.25														
			10	F	40°,50°	R,pl		100	59			CH	1 ≀ 2	2	2 ≀ 3
76.00															76
	76.35														
	76.65		20	F	40°	R,pl		100	0						
77.00			12	F	40°,30°	R, ir	calc,cl	100	40						77
	77.15		17	F	40°	R, ir		100	37			CM	2	3	4
	77.65		14	F	40°	r,pl,ir	FeO Calc	100	0	Lugeon Value 6.0					
78.00															78
	78.10		6	F	40°	R, ir	calc	100	55			CH	1 ≀ 2	2	3
79.00	79.00														79
			6	F	50°	R,pl	FeO Calc	100	29						
	79.70														
80.00	80.00		>20	F				100	0			CM	2	3	4
															80

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 9/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
		Dolomite with quartz veins light grey to grey , hard, fresh, fine grained.	14	F	50°	R, ir		100	24					1	3	4
	80.45		15	F	50°	R, ir		100	27							
81.00	81.00	Mechanical breaks are observed from														81
		80.10 m to 80.30 m	20	F	50°	R, ir		100	13						2	3
		80.45 m to 80.75 m														
	81.75	81.75 m to 81.85 m											CH	1	≀	≀
82.00		82.25 m to 83.20 m	10-15	F		R, ir		100	23						3	4
		83.80 m to 84.25 m														82
	82.35	84.10 m to 84.25 m														
		84.40 m to 85.70 m		F	80°	R, ir	FeO	100	0							
		86.70 m to 86.15 m												1	3	4
83.00	83.00	88.20 m to 88.40 m														83
			10-15	F	50°	R, ir	FeO	100	41							
	83.65												CH	1	2	3
84.00	84.00		>20	F		R	FeO	100	0							84
	84.10		>20	F		R		100	0							
			>20	F	40°	R,pl		100	0							
	84.50															
	84.80		>20	F				100	0						2	
85.00	85.00		>20	F				100	0				CM	1	≀	4
			>20	F				100	0						3	
	85.35															85
			>20	F	40°	R,pl		100	0							
86.00	86.00															86
			15-20	F	40°,50°	R, ir		100	60							
	86.50												CH			3
		Weathered fragments of rocks are present.		F	50°	R, ir	FeO	100	20							
87.00	87.00			F		R, ir		100	0				CM	1	2	4
	87.25															87
			11	F	20°,50°	R, ir		100	0				CH			3
88.00	87.85															
	88.20		8	F	40°	R,pl	calc	100	0							88
	88.40			F				100	0				CM	1	3	4
			19	F	60°,50°	R, ir	100		20							
89.00																89
	89.20												CH	1	2	3
			12	F	60°,50°	R, ir	FeO,cl	100	0							
90.00	90.00															90

Lugeon Value 7.0

ABBREVIATIONS:F-Fresh,SW-Slightly Weathered,MW-Moderately Weathered,HW-Highly Weathered,CW-Completely Weathered

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 10/10

DRILL HOLE NO.: B-2 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Description of Rock/Soil	Joints/m	Discontinuity Characteristics: Weathering	Orientation	Roughness	Infilling materials	Recovery %	RQD %	Core: Rec. / RQD (20, 40, 60, 80, 100)	Permeability (Lugeons)	Other tests	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing	
		Dolomite with quartz veins light grey to grey , hard, fresh, fine grained.	8	F	40°,50°	R, ir	FeO	100	20								
	90.75																
91.00		Mechanical breaks are observed from	7	F	50°	R	cl	100	47				CH	1	2	3	91
	91.30	92.00 m to 92.35 m															
		93.75 m to 94.00 m	10	F	20°,50°	R	calc	100	17								
		94.20 m to 94.60 m															
92.00		94.75 m to 94.95 m															92
		96.00 m to 96.50 m											CM	1	2	4	
	92.45																
		Coreloss is observed from	9	F	55°	R, ir	calc	100	43				CH	1	2	3	
93.00		97.50 m to 98.30 m															93
	93.65																
			18	F	50°	R, ir		100	20								
94.00													CM	1	2 ≀ 3	4	94
	94.10		>20	F	50°	R,pl	calc	100	0								
	94.60																
			>20	F	50°	R,pl		100	0								
95.00	95.00																95
			17	F	60°	R,pl	FeO	100	32				CH	1	2	3	
	95.70																
96.00			14	F	50°	R, ir		100	18								96
	96.25												CM	1	3	4	
			>20	F				100	0								
	96.50																
97.00			8	F	50°,55°	R,pl	FeO	100	55							3	97
	97.50															2 ≀ 3	
98.00			9	F	50°	R,pl		70	20				CH	1	2		98
	98.50																
99.00			11	F	50°,60°	R,pl	calc,cl	100	33							3	99
100.00	100.00	**Hole terminated at 100.00 m**															100

Lugeon Value 9.0

Lugeon Value 10.0

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SRC Lab, NEA Started: 2061.12.05 Completed: 2062.02.01

Drilled by: B.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 1 of 10

DRILL HOLE NO.: B-3 LOCATION: L/B
COORDINATES: X:3092706.40 Y: 525417.22 Z: 328.50
INCLINATION: 45° DIRECTION: 287°
DRILLING MACHINE: Long Year CASING DEPTH : 2.80 m (NW)
DRILLING METHOD: Rotary Drilling / Wire line System WATER TABLE: 21 m

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
1.00	1.50		From 0.00 m - 1.0 m Sludge (Crushed Dolomite in the size of gravel and sand) From 1.0 m - 1.5 m Fz + MB grey hard and fresh dolomite	F-sw			Feo		33	8							1
2.00	2.70		From 1.5 m - 2.15 m Fz + MB grey hard and fresh dolomite Rest of the material is sludge of sand and silt size obtained by crushing of dolomite	F-Sw	30°,10°	Sm	calc		54	10				CM	2	3	3 ~ 4 2
3.00	3.70		From 3.0-3.7 m FZ + MB, grey hard dolomite in the size of gravels Rest grey dolomite	F	50°	R	Calc	>5	100	14					2	3	4 3
4.00	4.30		From 3.7 m - 4.0 m FZ + MB Rest grey hard dolomite	F	70°	R	calc	10	100	21				CH	2	2	3 4
5.00	5.90		Grey, hard dolomite	F	50°	R	calc	2	100	82				B	2	2	2 5
6.00	7.00		From 5.90 m - 6.47 m grey hard dolomite From 6.47 m - 7.0 m FZ + MB	F	60°	sm-R	calc	>5	100	31				CH	2	2	3 6 4 7
7.00	7.55		Grey, hard dolomite	F	60°,70°	Sm	calc	7	100	30							3
8.00	8.30		Grey, hard dolomite From 8.12 m - 8.17 m - MB	F	50°-70°	Sm	calc	7	100	60							8
9.00	9.50		From 8.30 m - 9.00 m Sludge obtained by crushed dolomite From 9.00 m to 9.50 m FZ+ MB				Calc		33	0				CM	2	3	4 9
10.00	9.80		Fz + MB	F					100	0							10

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SRC Lab, NEA Started:2060.09.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 2 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
11.00	11.00		Grey hard dolomite From 9.80 m - 10.22 m sludge From 10.12 m - 10.48 m FZ + MB	F	70°,10°	Sm	none	>3	62	27	Lugeon Value 35.86			CM	2	3	4
12.00	12.10		Grey hard dolomite From 11.20 m - 11.35 m FZ + MB	F	50°	R	calc	3	100	68							
13.00	13.00		Grey, hard dolomite From 12.80 m - 13.0m Fz + MB	F	50°,35° 70°	R	calc	2	100	60				CH	1 ≀ 2	2	2 ≀ 3
14.00			Grey, hard dolomite	F	40°,60°	R	none	3	100	77							
15.00	14.85		Grey DolomiteFrom 15.10m-15.15m	F					100	0							
16.00	15.15		Grey hard dolomite	F	40°	R	none	2	100	89				B	1 ≀ 2	2	2
17.00	16.60		Grey dolomite From 16.80 m - 17.20 m Fz + MB Gravel to cobble size fragments	F	50°	R	Feo	4	100	26	Lugeon Value 34.56			CM	1 ≀ 2	3	3 ≀ 4
18.00	17.05		Grey, hard dolomite From 17.95 m - 18.65 m MB	F	40°	R	FeO	>6	100	23							
19.00	19.40		Grey, hard dolomite	F	40°	R	none	1	100	98				CH	1 ≀ 2	2	3
20.00	19.95																

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Sl-Silt

SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 3 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
	20.80		Grey, hard dolomite From 19.95 m - 20.25 m MB	F	40°	R	none	3	100	35							
21.00	21.80		Grey, hard dolomite From 21.45 m - 21.80 m MB	F		R	none	1	100	43							
22.00			From 22.30 m - 22.45 m MB	F	75°	R	none	4	100	54				CM	1 ≀ 2	2 ≀ 3	3 ≀ 4
23.00	23.15		Grey, hard dolomite From 23.35 m - 23.45 m MB	F	45°, 25	R	FeO	2	100	40							
24.00	23.65		Grey, hard dolomite. From 23.65m - 23.75 m and 24.10m - 24.30 m MB	F	85°	R	Feo	3	100	29							
	24.90		Grey, hard dolomite. From 24.30m - 24.50 m MB	F	30°	R	none	>5	100	0					2	2 ≀ 3	4
25.00	24.75		Grey, hard dolomite From 25.70 m - 25.90 m MB	F	70°	R	None	2	100	39				CH	1 ≀ 2	2	3
26.00	25.90		MB grey, hard dolomite	F	70°	R	none	>4	100	41							
27.00	27.00		Highly jointed and MB grey, hard dolomite	F	70°	R	FeO	>6	100	0				CM	1 ≀ 2	2 ≀ 3	3 ≀ 4
28.00	27.65		Grey, hard dolomite From 73.90 m - 28.00 m MB+Fz	F	40°	R	FeO	>6	100	0							
29.00	28.40		Grey, hard dolomite From 28.40 m - 28.55 m MB	SW		R	FeO	1	100	25							
	29.20		Grey, hard dolomite	F	50°,70°	R	FeO	6	100	44				CH	1 ≀ 2	2	3
30.00	30.00																

Lugeon Value 4.49

Lugeon Value 3.19

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 4 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Grey, hard dolomite	F	30°,60°	R	FeO, Calc	3	100	60	Lugeon Value 4.53			CH	1~2	2	3
31.00																	31
														B			2
	31.50																
32.00			Grey, hard dolomite From 32.30 m - 32.60 m MB	F	40°	R	Cl	4	100	40							32
	32.60													CH	1~2	2	3
33.00			Grey, hard dolomite From 32.60 m - 32.80 m and 33.55 m - 33.75 m MB	F	40°	R	none	5	100	0							33
	33.75															3	4
34.00																	34
			Grey, hard dolomite From 34.30 m - 34.60 m MB	F	30°	R	none	5	100	29						2	3
	34.60																
			Grey, hard dolomite	F			none		100	100				B		2	1
35.00	35.00																35
			Grey, hard dolomite From 35.00 m - 35.50 m MB	F	40°	R	none	1	100	40				CM		3	3~4
36.00	36.00																36
			Grey, hard dolomite	F	50°,70°	R	none	3	100	66				B	1	2	2
37.00																	37
	37.50																
38.00			Grey, hard dolomite From 38.75 m - 39.05 m MB	F	45°-50°	R	none	3	100	58	Lugeon Value 5.33						38
														CH			3
39.00																	39
	39.00																
			Grey, hard dolomite From 39.05 m - 39.20 m MB	F		R	none		100	58							
40.00																	40

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.09.22 Completed:2060.10.02

Drilled by:S.R. Timilsina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 5 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Joints/m	Core Recovery % REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
	40.60													CH	1	2	3
41.00	41.80		MB grey, hard dolomite	F	30°	R	none	3	100	16				CM	1	2 ≀ 3	4
42.00	42.15		MB + Fz grey, hard dolomite	F	20°	R	none	1	100	0				CH	1	2	3
			MB grey, hard dolomite From 42.75 m - 43.35 m Coreless (Coreless may be due to fractured zone and grinding of rock fragments during drilling	F	30°	R	none	1	50	11				CM	1	2~3	4
43.00	43.35																
			Grey, hard dolomite From 43.35 m - 43.45 m; 43.80 m - 43.90 m and 44.40 m - 44.65 m MB	10°				2	100	0					1	2 ≀ 3	3 ≀ 4
44.00	44.65																
45.00			MB + Fz grey, hard dolomite						53	14					1 ≀ 2	3	4
	45.50																
46.00			Grey, hard dolomite From 45.50 m - 45.90 m MB+FZ						100	21							
	46.10		Grey, hard dolomite From 46.10 m - 46.90 m MB+Fz						50	0				CM	1 ≀ 2	2 ≀ 3	3 ≀ 4
47.00	47.10		MB + Fz grey, hard dolomite						100	0							
	47.30														2	3	4
48.00			Grey, hard dolomite From 47.30 m - 48.00 m MB+Fz						62	0							
	48.60		MB + Fz grey, hard dolomite						100	0					1 ≀ 2	2 ≀ 3	3 ≀ 4
49.00	49.25																
			Grey, hard dolomite From 49.25 m - 49.40 m MB+FZ						16	0							
50.00																	

Lugeon Value 15.09

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Sl-Silt

SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 6 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Joints/m	Core Recovery % RQD %: REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing	
			From 49.40 m - 50.75 m coreless (Coreless may be due to fractured zone and grinding of rock fragments during drilling															
	50.75																	
51.00			Sludge						3	0								51
	51.80																	
			MB + Fz grey, hard dolomite						100	18					1 ~ 2	3	4	
52.00																		52
	52.60																	
			Grey, hard dolomite From 52.60 m - 52.75 m and 52.90 m - 53.25 m MB+Fz						100	0								
53.00																		53
	53.25		Grey, hard dolomite	F	40°	R	none	4	83	0				CM	1 ~ 2	2 ~ 3	3 ~ 4	
54.00	53.85		MB + FZgrey, hard dolomite	F					95	0								54
55.00	54.90		Grey, hard dolomite	F	40°,50°	R	none	5	100	25				CH	1 ~ 2	2	3	55
	55.50																	
56.00			Grey, hard dolomite From 56.20 m - 56.30 m MB+FZ	F	20°,25°	R	FeO	2	100	71				CM	2	3	4	56
	56.80																	
57.00			Grey, hard dolomite From 56.30 m - 56.55 m MB 57.15 m - 57.30 m MB+FZ	F	40°,20°	R	Cl	2	100	58								57
	57.30														2	2	2 ~ 3	
			Grey, hard dolomite	F	35°	R	Cl	2	100	42								
58.00																		58
	58.80																	
			Grey, hard dolomite From 58.30 m - 58.80 m MB+FZ	F	70°	R	FeO		56	0				CH	2	2 ~ 3	3	
59.00																		59
	59.05		Grey, hard dolomite	F	70°	R	Cl	4	100	62					1 ~ 2	2	2 ~ 3	
	59.80																	
60.00																		60

Lugeon Value 2.11

Lugeon Value 2.71

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 7 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
			Grey, hard dolomite	F	35°,50°	R	Cl	5	100	59				CH	1 ≀ 2	2	3 ≀ 4
61.00	60.65		Grey, hard dolomite From 60.65 m - 60.90 m MB+FZ	F	70°	R	Cl	4	73	0				CM	2	3	4
62.00	61.75		Grey, hard dolomite From 61.75 m - 62.05 m MB+FZ	F	30°,40°	R	FeO	3	82	13				D	3	3	5
63.00	62.60		Grey, hard dolomite	F	60°	R	none		100	0							
64.00	63.10		Grey, hard dolomite From 63.60 m - 63.90 m MB	F					84	19							
65.00	64.40		Grey, hard dolomite From 64.70 m - 65.00 m MB	F					100	16				CM	1 ≀ 2	2 ≀ 3	3 ≀ 4
66.00	65.00		Grey, hard dolomite From 65.75 m - 65.90 m MB	F					89	0							
67.00	65.90		MB grey, hard dolomite	F					68	0							
68.00	67.00		Grey, hard dolomite From 67.90 m - 68.00 m MB From 67.00 m - 67.90 m coreloss Coreloss is due to fractured zone	F					5	0							
69.00	68.00		Grey, hard dolomite	F	40°,60°	Sm	none	3	100	80				B	1	2	2
70.00	69.00		Grey, hard dolomite	F	50°	Sm	Cl	2	100	66							

Lugeon Value 2.50

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.09.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 8 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing	
71.00	70.35		Grey, hard dolomite	F	60°	Sm-R	None	3	100	57	Lugeon Value 2.00			B	1	2	2	71
72.00	71.95		Grey, hard dolomite From 71.95 m - 72.95 m MB	F	20° 70°, 30°	R	Cl	4	100	27				CH	1 ~ 2	2	3	72
73.00	73.40		Grey, hard dolomite From 74.20 m - 74.40 m MB	F	10°,30°	R	none	5	100	25				CM	1 ~ 2	2 ~ 3	3 ~ 4	73
74.00	74.40		MB grey, hard dolomite	F			none		100	70				CH	1~2	3	4	74
75.00	74.96		Grey, hard dolomite From 75.30 m - 75.50 m MB+FZ From 75.95 m - 76.05 m MB+FZ	F	25°	R	none	1	87	22				CH	1~2	2	3	75
76.00	76.05		Grey, hard dolomite From 76.05 m - 76.25 m and 77.00 m - 77.30 m MB+FZ	F	60°,10°	R	none	4	100	22	Lugeon Value 1.79			CM	1 ~ 2	2 ~ 3	3 ~ 4	76
77.00	77.30		Grey, hard dolomite From 77.75 m - 78.70 m MB+FZ	F	40°	R	none	2	86	8				CH	1 ~ 2	2	3	77
78.00	78.70		MB and highly jointed grey hard dolomite	F	20°,30°	R	none	>5	100	0				CM	1 ~ 2	3	4	78
79.00	79.60		Highly fractured and MB Dolomite	F					100	0				CH	1 ~ 2	2	3	79
80.00																		80

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilsina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 9 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
	80.05		Grey, hard dolomite	F	40°,20°	R	none	4	100	49				CH	1 ≀ 2	2	3
81.00	81.05		Highly fractured and MB grey, hard dolomite	F					70	0				CM	2	3	4
82.00	81.90		MB + Fz grey, hard dolomite	F					100	0							
83.00	82.90		Grey, hard dolomite	F	40°,60°	R	Cl	4	100	31				CH	1	2	2 ≀ 3
84.00	84.05		Grey, hard dolomite From 84.50 m - 84.65 m MB	F	50°	R	Calc	3	100	62				CM	1	2~3	4
85.00	85.20		Grey, hard dolomite	F	50°,60°	R	Calc, FeO	4	100	60	Lugeon Value 2.10						
87.00	86.85		Grey, hard dolomite	F	30°,60°	Sm-R	none	4	100	70	Lugeon Value 1.50			CH	1	2	2 ≀ 3
88.00	88.35		Grey, hard dolomite From 88.35 m - 88.45 m MB	F	40°-60°	Sm-R	none	4	100	60							
89.00																	
90.00																	

81 82 83 84 85 86 87 88 89 90

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SRC Lab, NEA Started:2060.9.22 Completed:2060.10.02

Drilled by:S.R. Timilshina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar

BORE HOLE LOG

SHEET 10 of 10

DRILL HOLE NO.: B-3 LOCATION: Dam Axis (L/B)

Depth, m	Run Depth, m	Log	Description of Rock/Soil	Alteration/Weathering	Description of Discontinuities: Orientation	Roughness	Filling Material	Core Recovery % RQD %: Joints/m	REC %	RQD %	Permeability (Lugeons)	Other Tests	Remarks/Test Results	Rock Mass Classification: Classification	Weathering	Hardness	Joint spacing
91.00	91.10		Grey, hard dolomite From 90.95 m - 90.75 m MB	F	60°-70°	Sm-R	none	6	100	91				CH	1	2	3
92.00	92.65		Grey, hard dolomite From 91.70 m - 91.85 m and 92.30 m - 92.65 m MB	F	40°	Sm-R	None	3	100	40							
93.00									7								
94.00	94.00		MB grey, hard dolomite	F					17	0				CM	1 ~ 2	3	4
95.00	94.85		MB + Fz grey, hard dolomite	F					100	0							
96.00	95.50		MB + Fz grey, hard dolomite						35	0							
	96.00		Grey, hard dolomite From 96.00 m - 96.60 m MB	F	40°	R	none	1	100	12					1	2	3
97.00	96.80		Grey, hard dolomite From 97.45 m - +97.60 m MB	F	70°	R	none	2	100	87							
98.00	97.60		Grey, hard dolomite	F	50°,70°	R	none	4	100	90	Lugeon Value 2.55			B	1	2	2
99.00	98.95		Grey, hard dolomite	F	70°	R	none	3	100	78							
100.00	100.55																

ABBREVIATIONS: F- Fresh, SW-Slightly Weathered, MW-Moderately Weathered, HW-Highly Weathered, CW-Completely Weathered, MB-Mechanical Break, Pl-Planar, Sm-Smooth, R-Rough, FeO-Iron Oxide, Cl-Clay, Si-Silt

SRC Lab, NEA Started:2060.09.22 Completed:2060.10.02

Drilled by:S.R. Timilsina/T.Neupane Logged by: S.Shrestha Reviewed by: J. M. Tamrakar