DRILL LOG HOLE NO. TD-3 SHEET NO. 3 OF 7

| PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 200.00m | ELEV | ATION | 252.00m |
|--------------|----------------------------|------------|--------|---|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODIN | NATE | N 14 ⁰ 34'24"; E 121 ⁰ 26'13.2" | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| CASING DEPTH | 96.00m | DATE | | | DRILLED | Palm | a | | |

| | | | | lio | | Core Recovery | | | | SP | T-Tes | st | | | 2 |
|--|-----------|---------|----------------|---------------------------------------|--|--|-------|---------|---|----|-----------|-------------|----|----|----------------------------|
| Scale | Elevation | E Depth | Column Section | Type of Rock or Soil | Description | R Q D D SO 100 R Sock Classification | G.W.L | N-Value | 0 | 10 | N-1 20 | Value 30 | 40 | 50 | WPT-Test (Lugeon Value) |
| - 61 - 62 - 63 - 64 - 65 | | | | erate and shale | | (100), (100), (100), (100), (100), (100), (100), (100), (100), (100), | | | | | | | | I | Lu'=4.5 (Pc=7.0) |
| - 66 - 67 - 68 - 69 - 70 | | | | Alternation of conglomerate and shale | Below 67.50m, core becomes more hard than above section, because observed slightly slaking not extremely in shale layers. | (400a (100a (100a (100a (100a (100a (100a (100a (100a (100a (100a (100a (100a (100a (110a) | | | | | | | | | Lu'=4.2 (Pc=7.9) |
| - 74 | 178.20 | 73.80 | | | Bedding planes dipping 55°. 73.80-80.70m | (100) (100) (100) (100) (100) (100) (100) | | | | | | | | | Lu'=4.5 (Pc=6.2 |
| - 75 - 76 - 77 - 78 - 79 - 80 | 171.30 | 80.70 | | Conglomerate | Gray firm conglomerate, with rubbles of 0.5-5cm in diameter. Partly thin layers of fine to coarse grained sandstone and shale with bedding planes of 60° in dip. | (4004, 1300) (4004, 1100) (14004, 1100) (4004, 1100) (4006, 1100) (4008, 44004, 1400) | | | | | | | | | Lu'=7.0 (Pc=4.8 |
| 81 82 83 84 85 | | | | tone | 80.70-90.0m Gray sandstone, medium to very coarse grained, very firm and massive, with bedding planes of 60°in dip. | (400), (1 | | | | | | | | | Lu'=4.8 (Pc=4.8) |
| 86 87 88 89 | 162.00 | 90.00 | | Sand Stone | | (100) (100) (100) (100) (100) (100) (100) (100) (100) | | | | | | | | [| Lu'=3.6 (Pc=5.5) |

DRILL LOG HOLE NO. TD-3 SHEET NO. 4 OF 7

| PROJECT | Study on Water Res | sources Develop | ment for Metro Manila | DEPTH | 200.00m | ELEV | ATION | 252.00m |
|--------------|----------------------------|-----------------|---|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODINATE | N 14 ⁰ 34'24"; E 121 ⁰ 26'13.2" | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| CASING DEPTH | 96.00m | DATE | | DRILLED | Palm | a | | |

| | | | | lis | | Core Recovery | П | | SPT-Test | |
|----------------------|-----------|--------|----------------|----------------------|--|---|------------------|---|-----------------------|----------------------------|
| Scale | Elevation | Depth | Column Section | Type of Rock or Soil | Description | Rock Classification | G.W.L N-Value | | | WPT-Test (Lugeon Value) |
| (m) | (m) | (a) | 0 | Typ | | 0 50 100 | | 0 | N-Value 10 20 30 4 | 0 50 |
| 91 92 93 94 | | | | | 90.00-109.10m Gray firm conglomerate, with rubbles of 0.5-4cm in diameter. A few calcite veins noted dipping 50-60°. | (100) (100) (100) (100) (100) (100) (100) | | | | Lu'=4.2 (Pc=9.3) |
| 95 - 96 - 97 | | | | | | (100) (100) (100) | | | | Lu=4.3 |
| - 98 - 99 | | | | Conglomerate | | (100) (100) (100) | | | | |
| 100 | | | :::: | 3 | | 11000 | | _ | | |
| 101 | | | :::: | | | 11007 | | - | | |
| -102 | | | | | | (1 do), 1100) | | | | Lu=5.0 |
| 103 | | | :::: | | | (100) (100) | | | | Lu-3.0 |
| 104 | | | :::: | | | [100] (100 <u>%</u> | | | | |
| -105 | | | :::: | | | (100), (100) | | | | |
| 106 | | | :::: | | | (100) | | | | |
| - | | | :::: | | | (100) (100) | | | | Lu'=4.0 |
| -107 | | | :::: | | | (1.00), (1.00) | | | | Lu -4.0 |
| -108 | | | | | | (100) | | | | |
| - | 142.90 | 109.10 | | | 109.10-170.60m | (100) | | | | |
| -110 - | | | | | Gray hard shale, partly greenish or | 0.00 | | | | |
| -111 | 1 | | | | reddish. A few calcite veins noted | 000 | | | | Lu'=5.3 |
| -112 | | | | | dipping 30°and60°. In 109.60-129.60m, noted bedding | (100) | | | | (Pc=5.0) |
| -113 | | | | | planes of 60° in dip with cracks | (100) | | | | |
| 114 | | | | Shale | parallel. | (100) | | - | 1-1-1- | 7 |
| 115 | | | | Sh | | i iooj CM | | - | | |
| -116 | | | | | | (100) | | | | |
| -117 | | | | | | [100] | | - | | Lu'=2.0 (Pc=5.1) |
| 118 | | | | | | 1100) | | | | |
| 119 | | | | | | 1100) | | _ | | |
| 120 | | | | | | (100) (100) | | | | |

DRILL LOG HOLE NO. TD-3 SHEET NO. 5 OF 7

| I | PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 200.00m | ELEV | /ATION | 252.00m |
|---|--------------|----------------------------|------------|--------|---|-------------|----------|------|--------|---------|
| Ī | SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 14 ⁰ 34'24"; E 121 ⁰ 26'13.2" | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| ſ | CASING DEPTH | 96.00m | DATE | | | DRILLED | Palm | a | | |

| | | | | lic | | Core Recovery | | | SPT-Test | |
|------------------------------|-----------|-------|----------------|----------------------|---|---|-------|---------|------------------|----------------|
| Scale Scale | Elevation | Depth | Column Section | Type of Rock or Soil | Description | R Q D N | G.W.L | N-Value | 0 10 20 30 40 50 | (Lugeon value) |
| 120 | | | | 500 | | 0 50 100 | | | 0 10 20 30 40 50 | |
| -121 -122 -123 -124 | | | | | | (100) (100) (100) (100) (100) (100) (100) | | | Lu'=7 (Pc=5 | |
| -125 -126 -127 | | | | | In 125.50-129.30m, alternation | (100) (100) (100) (100) (100) | | | Lu'=€ | 6.6 |
| -128 -129 | | | | | with fine to medium grained sandstone layers of 20-60cm in thickness. | (100), 110d) (100), 110d) (100), (100), | | | | |
| -130 | | | | | L. 120 (0.170 (0), and the disc. | (100) | | | | \exists |
| -131 | | | | | In 129.60-170.60m, noted bedding planes of 45-55° in dip with some | (100) (100) | | | Lu'=4 | |
| -132 -133 | | | | | cracks parallel. | ()-GO _A | | | (Pc=S | 5.0) |
| -134 | | | | | | 1100) | | | | |
| -135 | | | | Shale | | (1de) (100) | | | | _ |
| -136 | | | | S | | 1100 | | | Lu'=3 | |
| -137 | | | | | | (190) | | | (Pc=6 | 6.0) |
| 138 | | | | | Slightly cracky and fragile in | (100) (100) | | | | |
| -139 | | | | | 137.30-138.40m and 140.00- | (100)CM | | | | |
| -140 | | | | | 141.90m. | (100) | | | | |
| -141 | | | | | | (100) (100) | | | Lu'=1 | 11.0 |
| -142 -143 | | | | | In 141.90-146.50m, alternation | (100), [100] | | | | |
| -144 | | | | | with medium grained sandstone layers of 10-70cm in thickness. | [190] | | | | |
| -145 | | | | | layers of 10-700m in unickness. | (100) | | | | _ |
| -146 | | | | | | 11003 | | | | |
| -147 | | | | | | 1000 | | | Lu'=4 (Pc=9 | |
| -148 | | | | | | (1-00) | | | | |
| -149 | | | | | | 1100 | | | | |
| 150 | | . 8 | | | | (100 <u>1</u> | | | | |

DRILL LOG HOLE NO. TD-3 SHEET NO. 6 OF 7

| | PROJECT | Study on Water Res | sources D | evelop | ment for Metro Manila | DEPTH | 200.00m | ELEV | /ATION | 252.00m |
|---|-------------|----------------------------|-----------|--------|---|-------------|----------|------|--------|---------|
| | SITE | Transfer Tunnel No.1 Route | COODIN | NATE | N 14 ⁰ 34'24"; E 121 ⁰ 26'13.2" | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| С | ASING DEPTH | 96.00m | DATE | | | DRILLED | Palm | a | | |

| | | | | li | | Core Recovery | | -633 | | SI | T-Te | st | | | 1 |
|------------------------------|-------------|---------|----------------|----------------------|--|--|-------|---------|---|----|------|-------|----------|-----|----------------------------|
| Scale Scale | E Elevation | E Depth | Column Section | Type of Rock or Soil | Description | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | G.W.L | N-Value | 0 | 10 | N- | Value | 40 | 50 | WPT-Test (Lugeon Value) |
| 150 | | | | | | (100x | | | | 10 | 20 | 30 | 40 | 30 | |
| -151 -152 -153 -154 | | | | | | (100) (100) (100) (100) (100) (100) (100) (100) | | | | | | | | | Lu'=3.7 (Pc=8.0) |
| 155 | | | | | | 4.00 | | | | | | | | | |
| -156 -157 | | | | | Calcareous red shale noted in | (100) (100) (100) | | | | | | | | | |
| 158 | | | | | 155.00-169.30m. | (100) 1000 | | | | | | | | | Lu=7.1 |
| 159 | | | | | | (100) [100] | | | | | | | - | | |
| 160 | | | | Shale | | hibon CM | | | | - | - | + | - | - | |
| 161 | | | | | | [100] | | | | + | | - | + | | |
| - -162 | | | | | | (100) (100) (100) | | | | | | | | | Lu'=6.1 |
| -163 -164 | | | | | Below 162.80m, calcite veins and pools rich. | (1.00), [1.00] | | | | | | | | | |
| 165 | | | | | 11. | 11001 | | | - | - | - | + | - | _ | |
| -166 | | | | | | 1100 | | | - | _ | - | - | - | 200 | |
| 167 | | | | | Calcareous gray shale noted in | (1.00) (1.00) | | | | _ | _ | _ | _ | | 'Lu'=4.5 |
| -168 | | | | | 169.30-169.90m. | (3-00) | | | | | | | | | (Pc=5.1) |
| - | | | | | In 169.90-170.60m, low core | (100) (100) | | | | | | | | | |
| 169 | | | | | recovery with fragments of green calcareous shale. Possibly minor | (100) | | | | | | | | | |
| -170 | 81.40 | 170.60 | | | fault. | 4.003 D | | | | | 1 | | | - | |
| -171 | | | | | 170.60-177.90m | (90) | | | | | | + | - | | |
| -172 | | | 井 | | Dark white limestone. | 1901 | | | - | + | + | + | + | | Lu'=3.3 (Pc=5.1) |
| 173 | | | | 120 | In 170.60m, brownish surface of crack observed. | (100) | | | - | - | + | - | + | - | . / |
| - -174 | | | | tone | CIACK OUSEIVEU. | 100j | | | - | _ | _ | - | - | | |
| -175 | | | | Limestone | 177.90-200.00m | [75] [70] | | | - | - | - | - | - | | |
| - -176 | | | 4 | | Gray to light gray shale, hard and | (1.00) (100)CM | | | 1 | - | - | - | - | | |
| - -177 | | | | | / calcareous, with bedding planes of | (100) (100) | | | | - | _ | | _ | | Lu'=3.2 (Pc=5.1) |
| -178 | 74.10 | 177.90 | | snc | 45°in dip. It looks fragile along thin foliated layers of dark gray shale, | (100) (100) | | | | - | + | - | + | | |
| -179 | | | | Calcareous Shale | caused by release of in-situ stress | (100), (100) | | | - | - | - | + | \dashv | | |
| | 0 1 | | | Ca | during drilling operation. | (1 dox (1 dox) | | | | | | | | | |

DRILL LOG HOLE NO. TD-3 SHEET NO. 7 OF 7

| PROJECT | Study on Water Res | sources Develop | ment for Metro Manila | DEPTH | 200.00m | ELEV | 'ATION | 252.00m |
|--------------|----------------------------|-----------------|---|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODINATE | N 14 ⁰ 34'24"; E 121 ⁰ 26'13.2" | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| CASING DEPTH | 96.00m | DATE | | DRILLED | Palm | a | | |

| (m) (m) | Depth Column Section | or S | | Core Recovery | | SPT-Test | |
|---------------------------------|-------------------------|----------------------|--|--|---------|-----------------|----------------------------|
| 160 | (a) 3 | Type of Rock or Soil | Description | Core Recovery R Q D Rock Classification O 50 100 | N-Value | 0 10 20 30 40 5 | WPT-Test (Lugeon Value) |
| 181 182 183 184 | | | In 181.00-182.00m, low core recovery with fragments in which surface extremely brownish. Possibly fault zone. | (60) (100) CM | | | Lu'=10.2 |
| 186 187 188 189 | | Calcareous Shale | | (100), (100), (150) (160), (16 | | | Lu'=11.2 |
| 191 192 193 194 | | | | (1.00), (60)] (1.00), (50)] (1.00), (1.00), (1.00), (1.00), (1.00), (1.00), (70)] | | | Lu'=12.1 |
| 195 196 197 198 199 | 200.00 | | In 194.50-200.00m, no foliated layers of dark gray shale. Massive and hard with bedding of 40°in dip in upper portion, and of 20-30°in lower portion. | (4.00), (1.00), (50) (60) (50) (1.00), (57) | | | Lu'=12.1 |

DRILL LOG HOLE NO. TD-4 SHEET NO. 1 OF 5

| PROJECT | Study on Water Res | sources De | evelop | ment for Metr | o Manila | DEPTH | 150.00m | ELEV | ATION | 220.00m |
|--------------|----------------------------|------------|--------|---------------|-----------|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 1,612,380; | E 529,970 | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| CASING DEPTH | 24.00m | DATE | | | | DRILLED | Palm | a | | |

| | | | | lic | | Core Recovery | SPT-Test | |
|--|-----------|-------|----------------|----------------------|--|---|------------------------|----------------------------|
| E Scale | Elevation | Depth | Column Section | Type of Rock or Soil | Description | Rock Classification G.W.L O.Value | N-Value | WPT-Test (Lugeon Value) |
| (8) | / | (8) | -75 | | | 0 50 100 0 10 | N-Value 20 30 40 50 | 0 |
| 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 10 10 11 11 11 11 11 11 11 11 11 11 11 | | | | | In 23.50-24.80m and 28.40-29.40m, noted boulders of comparatively soft tuff breccia. | (90) - | 20 30 40 50 | |
| - 29 | 190.00 | 20.00 | | | | deox | | |

DRILL LOG HOLE NO. TD-4 SHEET NO. 2 OF 5

| PROJECT | Study on Water Res | sources Develo | oment for Metro Manila | DEPTH | 150.00m | ELEV | 'ATION | 220.00m |
|--------------|----------------------------|----------------|------------------------|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODINATE | N 1,612,380; E 529,970 | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| CASING DEPTH | 24.00m | DATE | | DRILLED | Palm | a | | |

| | | | - | lioil | | Core Recovery | | | | SPT | -Test | | | |
|--|-------------|---------|----------------|----------------------|--|---|------------|---------|---|-----|------------------|----|----|--|
| 3 Scale | E Elevation | E Depth | Column Section | Type of Rock or Soil | Description | R Q D D So 100 | G.W.L | N-Value | 0 | 10 | N-Value 20 30 | 40 | 50 | WPT-Test (Lugeon Value) |
| - 31 - 32 - 33 - 34 - 35 - 36 - 37 - 40 - 41 - 42 - 43 - 44 - 45 - 46 - 47 - 48 - 49 - 50 - 51 - 52 - 54 - 55 - 56 - 57 - 58 | | | | Tuff Breccia | Gray or light brown tuff breccia with mainly rubbles of fresh to weathered andesite, which is 1-5cm in average diameter, and including same boulders of 20-60cm in diameter. In 30.00-91.00m, mixed of massive core, fragments and soil. Iron stains generally noted on surface of cracks. Especially below parts are soil rich: 42.00-48.00m 51.40-53.00m 65.00-65.60m 82.00-83.00m 88.80-89.20m | (400) (100) | 55.00 9 | | | | | | | Lu=5.6 Lu=5.9 Lu=7.2 Lu'=2.5 (Pc=6.3) |

DRILL LOG HOLE NO. TD-4 SHEET NO. 3 OF 5

| ĺ | PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 150.00m | ELEV | ATION | 220.00m |
|---|--------------|----------------------------|------------|--------|------------------------|-------------|----------|------|--------|---------|
| | SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 1,612,380; E 529,970 | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| | CASING DEPTH | 24.00m | DATE | | | DRILLED | Palm | a | | |

| | | | | lio | | Core Recovery | | | | 5 | SPT- | Test | | | |
|----------------------------------|---|-------|----------------|----------------------|--|--|-------|---------|---|----|------|------------------|----|------|----------------------------|
| Scale Scale | - | Depth | Column Section | Type of Rock or Soil | Description | R Q D D SSification | G.W.L | N-Value | 0 | 10 |) : | N-Value 20 30 | 40 | 50 | WPT-Test (Lugeon Value) |
| - 61 - 62 - 63 - 64 | | | | | ı. | (100). (100). (200). (200). | | | | | | | | 3333 | Lu'=1.9 (Pc=8.0) |
| 65 66 67 68 69 | | | | | | (88) o- (90) o- (86) o- (88) o- | | | | | | | | | Lu'=2.0 (Pc=8.0) |
| 70 71 72 72 73 74 74 | | | | Tuff Breccia | | (86) (| | | | | | | | | Lu'=2.2 (Pc=8.0) |
| 75 76 77 78 78 79 | | | | TuffB | | (84) ÷ (88) ÷ (80) ∴ | | | | | | | | | Lu'=1.9 (Pc=8.3) |
| 80 81 82 83 84 | | | | | In 82.00-83.00m, noted a layer of reddish gray tuff which is fine grained. In 84.00-89.20m, iron stains | (90) ÷ (90) ÷ (90) ÷ (90) ÷ (90) ÷ | | | | | | | | | Lu'=1.8 (Pc=8.3) |
| 85 86 87 88 88 89 | | | | | noted extremely. | (90) 6 (92) 5 (94) 5 (93) 6 | | | | | | | | | Lu'=2.7 (Pc=8.1) |

DRILL LOG HOLE NO. TD-4 SHEET NO. 4 OF 5

| | PROJECT | Study on Water Res | sources Do | evelop | ment for Metro Manila | DEPTH | 150.00m | ELEV | ATION | 220.00m |
|---|--------------|----------------------------|------------|--------|------------------------|-------------|----------|------|--------|---------|
| | SITE | Transfer Tunnel No.1 Route | COODIN | NATE | N 1,612,380; E 529,970 | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| ĺ | CASING DEPTH | 24.00m | DATE | | | DRILLED | Palm | a | | |

| | | | | lios | | Core Recovery | SPT-Test |
|--------------------------------------|-----------|-------|----------------|----------------------|---|---|--|
| Scale | Elevation | Depth | Column Section | Type of Rock or Soil | Description | ica | G.W.L. N-Value WPT-Test (Lugeon Value) |
| (a) | (m) | (n) | | , | | 0 50 100 | 0 10 20 30 40 50 |
| 91 - 92 - 93 - 94 | | | | | In 91.00-120.30m, core-specimens are comparatively hard, partially weathered soft. Totally, slightly to moderately iron stains observed on surface of cracks. | (88) 4 (88) 4 (88) 4 | Lu'=2.9 (Pc=8.1) |
| - 95 - 96 - 97 - 98 - 99 | | | | | Soft weathered core-specimens can be broken by hand. | (57) d. (57) d. (57) d. | Lu'=2.3 (Pc=8.1) |
| -100 -101 -102 -103 -104 | | | | secia | | (100). (100). (100). (100). | Lu'=2.1 (Pc=8.1) |
| -105 -106 -107 -108 -109 | | | | Tuff Breccia | | (88) 4- (90) - (90) - | Lu'=2.3 (Pc=8.1) |
| -110 -111 -112 -113 | | | | | | (94) o- (90) o- (89) o- (75) 4 | Lu'=1.7 (Pc=8.1) |
| -115 -116 -117 -118 -119 | | | | | | (100) (100) (100) (21) (90) | Lu'=1.8 (Pc=8.1) |

DRILL LOG HOLE NO. TD-4 SHEET NO. 5 OF 5

| ĺ | PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 150.00m | ELEV | ATION | 220.00m |
|---|--------------|----------------------------|------------|--------|------------------------|-------------|----------|------|--------|---------|
| | SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 1,612,380; E 529,970 | INCLINATION | Vertical | DRII | LL RIG | LY 44 |
| | CASING DEPTH | 24.00m | DATE | | | DRILLED | Palm | a | | |

| | | | lio | | Core Recovery | SPT-Test | |
|--------------------------------------|--------------------------|---------|----------------------|--|--|------------------|----------------------------|
| E Scale | Elevation Depth | Colu | Type of Rock or Soil | Description | R Q D OSO 100 | 0 10 20 30 40 50 | WPT-Test (Lugeon Value) |
| 121 122 123 | | | ccia | In 120.30-132.00m, comparatively fresh and hard, with some sharp cracks dipping 60-90°. In 120.30-125.00m, iron stains noted on surface of cracks, while not observed extremely brownish color in 125.00-132.00m. | (68) 4 (160) (160) (26) 4 (24) 5 | I | Lu'=1.8 (Pc=8.1) |
| -125 -126 -127 -128 -129 | | | Tuff Breccia | | (88) 4 (94) 5 (94) 5 (94) 5 (96) | | Lu'=2.5 (Pc=8.1) |
| 131 | 38.00 132. 37.60 132. | .00 4 4 | Sand Stone | 132.00-132.40m Dark greenish sandstone, comparatively soft. | (100) | | Lu'=2.8 (Pc=8.1) |
| -135 -136 -137 -138 | 1.00 139. | | Fault | 132.40-139.00m Rock fragments with dark greenish gray (reduction color) sandy clay. Major fault. | (*0) E (*8) | | Lu'=3.0 (Pc=8.1) |
| -140 -141 -142 -143 -144 | | | Sand Stone | 139.00-150.00m Same as 132.00-132.40m, medium to coarse grained, easy to be broken by hammer hitting. In 139.00-140.90m and 142.50-145.50m, cracky caused by influence of fault. | (87) CL (87) CM (88) CM (88) CL | | Lu'=1.8 Pc=8.1) |
| -145 -146 -147 -148 -149 | 0.00 150 | 8 | Sand | In 139.70-140.00m, slickenside and striation noted on surface of cracks dipping 55° and 80°. | (85)4 | | Lu'=2.2 (Pc=8.1) |

DRILL LOG HOLE NO. TD-5 SHEET NO. 1 OF 3

| PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 70.00m | ELEV | /ATION | 158.00m |
|--------------|----------------------------|------------|--------|------------------------|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 1,612,530; E 527,380 | INCLINATION | Vertical | DRII | LL RIG | LY 24 |
| CASING DEPTH | None | DATE | | | DRILLED | Palm | a | | |

| | | | | oil | | Core Recovery SPT-Test | |
|---|------------------|---------|----------------|----------------------|--|--|--|
| 3 Scale | Elevation | E Depth | Column Section | Type of Rock or Soil | Description | R Q D C North Nort | WPT-Test (Lugeon Value) |
| 3 3 4 4 5 6 6 7 7 110 111 111 111 111 111 111 111 111 | 146.00 | 12.00 | | Shale | 0.00-12.00m Gray to greenish gray sandy shale, firm, with bedding planes of 5-10° in dip. | [100] [100] [100] [100] [100] | Lu'=1.8 |
| - 13 - 14 - 15 - 16 - 17 | | | | Sand Stone | 12.00-15.00m Gray firm sandstone, very coarse to medium grained, with graded bedding of 8°in dip. Surface of sharp vertical crack shows brownish color. 15.00-18.50m Low core recovery, although same as 12.00-15.00m. | [80] [80] [84] [90] [90] [84] | Lu'=1.2 (Pc=6.3) Lu'=1.1 (Pc=7.1) |
| - 19 - 20 - 21 - 22 - 23 - 24 - 25 | 139.50 | 18.50 | | Shale | 18.50-25.70m Gray, reddish gray or greenish gray sandy shale, banded, firm but cracky. Surface of sharp vertical crack indicates brownish color. | [192] [190] [100] [100] [100] | Lu'=0.9 (Pc=5.0) |
| 26 | 132.30 131.50 | | | Sand Stone all | 25.70-26.50m Brown soft soil. Possibly fault. 26.50-46.50m Gray sandstone, fine to medium grained, banded and firm. | [150] D [150] [150] [150] [150] | Lu'=1.1 (Pc=8.5) |

DRILL LOG HOLE NO. TD-5 SHEET NO. 2 OF 3

| PROJECT | Study on Water Res | sources De | evelop | ment for Metro Manila | DEPTH | 70.00m | ELEV | ATION | 158.00m |
|--------------|----------------------------|------------|--------|------------------------|-------------|----------|------|--------|---------|
| SITE | Transfer Tunnel No.1 Route | COODIN | IATE | N 1,612,530; E 527,380 | INCLINATION | Vertical | DRII | LL RIG | LY 24 |
| CASING DEPTH | None | DATE | | | DRILLED | Palm | a | | |

| | | | _ | lio | | Core Recovery | | | | | SPT- | Test | | | | |
|--|-------------|---------|----------------|------------------------------------|--|--|-----|-----------|---|---|------|----------------|---------|----|----|----------------------------|
| § Scale | E Elevation | E Depth | Column Section | Type of Rock or Soil | Description | R Q D R C C C C C C C C C | IMO | N-Value | 0 | 1 | 0 | N-Valu 20 3 | ie 0 | 40 | 50 | WPT-Test (Lugeon Value) |
| - 31 - 32 - 33 - 34 | | | | | In 31.60m, brownish surface of sharp crack dipping 85°. | 1100j 1100j 1100j 1100j CM 1100j | | | | | | | | | | Lu'=1.2 (Pc=8.9) |
| 35 36 37 38 39 | | | | Sand Stone | | | 36. | 00 | | | | | | | | Lu'=1.0 (Pc=8.7) |
| 40 - 41 - 42 - 43 - 44 - 45 - 46 | | | | | In 42.30-46.50m, some cracks dipping 60-80° with slightly brownish surface. | political politi | | | | | | | | | | Lu'=0.9 (Pc=5.9) |
| - 47 - 48 - 49 | 108.00 | | | Shale | 46.50-50.0m Gray sandy shale, firm, with graded bedding. Some cracks with slightly brownish surface. | 1100 | | | | | | | | | | Lu'=0.9 (Pc=8.0) |
| - 50 - 51 - 52 - 53 - 54 | 106.50 | 51.50 | | Conglomerate Sand | 50.00-51.50m Gray sandstone, fine to coarse graded, slightly greenish. 51.50-55.20m Gray conglomerate including granules. Below 53.70m, no brownish | 1100) 1100) 1100) | | | | | | | | | | Lu'=1.0 (Pc=8.1) |
| - 55 - 56 - 57 - 58 - 59 | 102.80 | 55.20 | | Alternation of shale and sandstone | surface of cracks. | 1100 CM 1100 1100 1100 | | | | | | | | | | Lu'=1.2 (Pc=8.6) |

DRILL LOG HOLE NO. TD-5 SHEET NO. 3 OF 3

| PROJEC | Т | Study on Water Res | sources D | evelop | ment for Metro Manila | DEPTH | 70.00m | Om ELEVATION | | 158.00m |
|-----------|------|----------------------------|-----------------------------|--------|------------------------|-------------|----------|--------------|--------|---------|
| SITE | | Transfer Tunnel No.1 Route | COODINATE N 1,612,530; E 52 | | N 1,612,530; E 527,380 | INCLINATION | Vertical | DRII | LL RIG | LY 24 |
| CASING DE | EPTH | None | DATE | | | DRILLED | Palm | a | | |

| | | tion | r Soil | | Core Recovery | | SPT-Test | t ue) |
|---|-------|----------------|------------------------------------|---|--|-----------------------------|----------------------------|---------------------|
| E Scale E Elevation Depth Column Section Type of Rock or Soil | | Type of Rock o | Description | R Q D D Sassification N-Value | | N-Value 0 10 20 30 40 50 | WPT-Test (Lugeon Value) | |
| - 61 - 62 - 63 - 64 - 65 | | | Altermation of shale and sandstone | 55.20-70.00m Alternation of sandy shale and sandstone, shale rich (65%) and 50-100cm cycled. Shale is gray, greenish gray or reddish gray, and banded with bedding planes of 10°in dip. | 1991 1992 11000 11000 1991 WO-7-7 | | | Lu'=1.0 (Pc=8.7) |
| - 66 - 67 - 68 - 69 | 70.00 | | Altermation of s | Sandstone is fine tocoarse grained, and gray. In 60.30-70.00m, comparatively cracky. | 90] 1100 903 923 | | | Lu'=0.8 (Pc=6.2) |
| - 69 88.00 | 70.00 | | | | [94] | | | • |
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