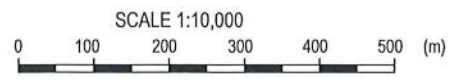
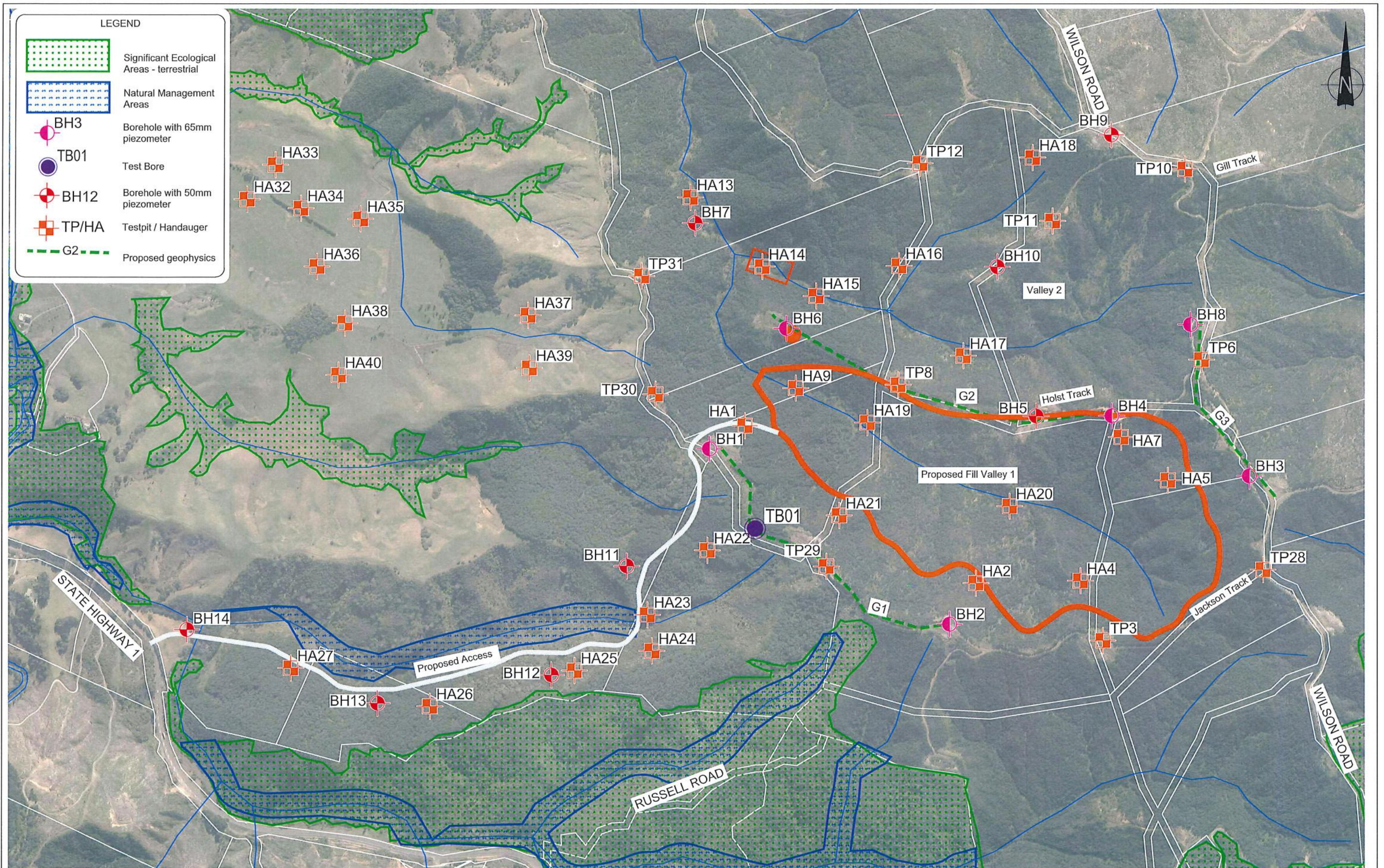


Appendix A: Figures

- Figure 1: Site Investigation Plan



Aerial photo sourced from Auckland Council GIS Website.
 Property boundaries sourced from Land Information New Zealand data as at 16-Feb-2017
 (Crown Copyright Reserved).

| | | | |
|--|--|---|--|
| Tonkin+Taylor 105 Carlton Gore Road, Newmarket, Auckland www.tonkintaylor.co.nz | DRAWN: RBS Apr.19 DRAFTING CHECKED: APPROVED: CADFILE: 1005069.1120-F1.dwg SCALES (AT A3 SIZE): 1:10,000 PROJECT No. 1005069.1120 | WASTE MANAGEMENT NZ GEOTECHNICAL INVESTIGATION AUCKLAND REGIONAL LANDFILL PROJECT Site Investigation Plan | |
| | FIG. No. Figure 1 | REV. 0 | |

Appendix B: Field Investigations

- T+T Engineering Log Terminology
- Machine borehole logs and core photos
- Hand auger borehole logs
- Test pit logs
- Lugeon Test Results

Engineering log terminology

General

Soil and rock descriptions follow the “Guidelines for the field classification and description of soil and rock for engineering purposes” by the New Zealand Geotechnical Society (2005). Refer to this document for methods of field determination.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|------------------|----------------|------|----------------|-------------|-----------|---|-----------|------------------------|------------------|--|-------------|---------------------|-----------|-------------|-----------|-----------------|-----------|------------------|-----------|--------------------|------------|----------------------------|--------------|------------------|-------------|---------------|-----------|--------------|-------------|------------|------------|------------------------|------------------------|------------|
| <h3>Water</h3> | <h3>Graphic logs</h3> <p>The graphic log shows soil and rock types. The defect log indicates the location, orientation and abundance of defects of all types.</p> <p>Typical material symbols:</p> <table border="0"> <tr> <td> Organic material</td> <td> Igneous rock</td> </tr> <tr> <td> Clay</td> <td> Mudstone</td> </tr> <tr> <td> Silt</td> <td> Siltstone</td> </tr> <tr> <td> Sand</td> <td> Sandstone</td> </tr> <tr> <td> Gravel or Conglomerate</td> <td> Metamorphic Rock</td> </tr> </table> | Organic material | Igneous rock | Clay | Mudstone | Silt | Siltstone | Sand | Sandstone | Gravel or Conglomerate | Metamorphic Rock | <h3>Tests</h3> <ul style="list-style-type: none"> N=22:SPT uncorrected blow count for 300 mm 75/12:Undrained shear strength (peak /residual as measured by field vane. <p>Laboratory test(s) carried out:</p> <table border="0"> <tr><td>PMT</td><td>Pressuremeter test</td></tr> <tr><td>LT</td><td>Lugeon test</td></tr> <tr><td>LV</td><td>Laboratory vane</td></tr> <tr><td>AL</td><td>Atterburg limits</td></tr> <tr><td>UU</td><td>Undrained triaxial</td></tr> <tr><td>PSD</td><td>Particle size distribution</td></tr> <tr><td>c' Ø'</td><td>Effective stress</td></tr> <tr><td>CONS</td><td>Consolidation</td></tr> <tr><td>DS</td><td>Direct shear</td></tr> <tr><td>COMP</td><td>Compaction</td></tr> <tr><td>UCS</td><td>Unconfined compression</td></tr> <tr><td>IS₅₀</td><td>Point load</td></tr> </table> | PMT | Pressuremeter test | LT | Lugeon test | LV | Laboratory vane | AL | Atterburg limits | UU | Undrained triaxial | PSD | Particle size distribution | c' Ø' | Effective stress | CONS | Consolidation | DS | Direct shear | COMP | Compaction | UCS | Unconfined compression | IS₅₀ | Point load |
| Organic material | Igneous rock | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clay | Mudstone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Silt | Siltstone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sand | Sandstone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gravel or Conglomerate | Metamorphic Rock | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PMT | Pressuremeter test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LT | Lugeon test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LV | Laboratory vane | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AL | Atterburg limits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UU | Undrained triaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PSD | Particle size distribution | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c' Ø' | Effective stress | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CONS | Consolidation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DS | Direct shear | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMP | Compaction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UCS | Unconfined compression | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IS₅₀ | Point load | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <h3>Core recovery</h3> <p>Expressed as percentage of the length of the core run recovered.</p> | <h3>Installation type</h3> <table border="0"> <tr> <td> Standpipe</td> <td> Slotted screen</td> </tr> <tr> <td> VWP</td> <td> Bentonite seal</td> </tr> <tr> <td> Filter pack</td> <td></td> </tr> </table> | Standpipe | Slotted screen | VWP | Bentonite seal | Filter pack | | <h3>Sample type</h3> <table border="0"> <tr> <td> SPT</td> <td> Core</td> </tr> <tr> <td> Thin-wall tube</td> <td> Other</td> </tr> <tr> <td> Bulk sample</td> <td> Core or Sample loss</td> </tr> </table> | SPT | Core | Thin-wall tube | Other | Bulk sample | Core or Sample loss | | | | | | | | | | | | | | | | | | | | | | |
| Standpipe | Slotted screen | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VWP | Bentonite seal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filter pack | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | Core | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thin-wall tube | Other | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bulk sample | Core or Sample loss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Soil description

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-----------------------------|----------|--|----------|---|----------|---|--|--|--|----------------------------|-----------|-----------|------|----------|------|----------|----------|------|----------|-----------|-------|-----------|------------|------------|------------|----------|------|-------|--|--|--|-----------------------------|-----------|------------|--------|----------|-------|---------|-----------|--------------|----------|----------|-------|----------|-----------|------------|------|
| <h3>Moisture content</h3> <table border="0"> <tr><td>D</td><td>Dry, looks and feels dry</td></tr> <tr><td>M</td><td>Moist, no free water on hand when remoulding</td></tr> <tr><td>W</td><td>Wet, free water on hand when remoulding</td></tr> <tr><td>S</td><td>Saturated, free water present on sample</td></tr> </table> | D | Dry, looks and feels dry | M | Moist, no free water on hand when remoulding | W | Wet, free water on hand when remoulding | S | Saturated, free water present on sample | <h3>Consistency/undrained shear strength</h3> <table border="0"> <tr> <td></td> <td></td> <td>S_u (kPa)</td> </tr> <tr><td>VS</td><td>Very soft</td><td>< 12</td></tr> <tr><td>S</td><td>Soft</td><td>12 to 25</td></tr> <tr><td>F</td><td>Firm</td><td>25 to 50</td></tr> <tr><td>St</td><td>Stiff</td><td>50 to 100</td></tr> <tr><td>VSt</td><td>Very stiff</td><td>100 to 200</td></tr> <tr><td>H</td><td>Hard</td><td>> 200</td></tr> </table> | | | S_u (kPa) | VS | Very soft | < 12 | S | Soft | 12 to 25 | F | Firm | 25 to 50 | St | Stiff | 50 to 100 | VSt | Very stiff | 100 to 200 | H | Hard | > 200 | <h3>Density index</h3> <table border="0"> <tr> <td></td> <td></td> <td>SPT(N) - uncorrected</td> </tr> <tr><td>VL</td><td>Very loose</td><td>0 to 4</td></tr> <tr><td>L</td><td>Loose</td><td>4 to 10</td></tr> <tr><td>MD</td><td>Medium dense</td><td>10 to 30</td></tr> <tr><td>D</td><td>Dense</td><td>30 to 50</td></tr> <tr><td>VD</td><td>Very dense</td><td>> 50</td></tr> </table> | | | SPT(N) - uncorrected | VL | Very loose | 0 to 4 | L | Loose | 4 to 10 | MD | Medium dense | 10 to 30 | D | Dense | 30 to 50 | VD | Very dense | > 50 |
| D | Dry, looks and feels dry | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Moist, no free water on hand when remoulding | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| W | Wet, free water on hand when remoulding | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Saturated, free water present on sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | S_u (kPa) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VS | Very soft | < 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Soft | 12 to 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | Firm | 25 to 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| St | Stiff | 50 to 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VSt | Very stiff | 100 to 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard | > 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SPT(N) - uncorrected | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VL | Very loose | 0 to 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | Loose | 4 to 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MD | Medium dense | 10 to 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | Dense | 30 to 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VD | Very dense | > 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Proportional terms definition (Coarse soils)

| Fraction | Term | % of soil mass | Example |
|-------------|-----------------------------------|-------------------|-------------------------------------|
| Major | (UPPER CASE) | Major constituent | GRAVEL |
| Subordinate | (lower case) | > 20 | Sandy |
| Minor | with some... with minor... | 12 - 20 5 - 12 | with some sand with minor sand |
| | with trace of... (or slightly)... | < 5 | with trace of sand (slightly sandy) |

Grain size criteria

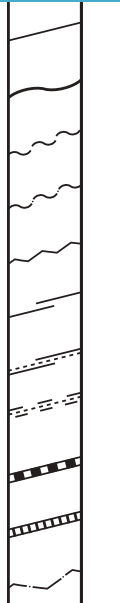
| Type | Coarse | | | Fine | | |
|------------------------|----------|---------|--------------------------|--------------------------|------|-------|
| | Boulders | Cobbles | Gravel | Sand | Silt | Clay |
| | | | Coarse Medium Fine | Coarse Medium Fine | | |
| Size range (mm) | 200 | 60 | 20 6 | 2 0.6 0.2 | 0.06 | 0.002 |



Engineering log terminology

Rock description

| Significant defects | |
|---------------------|---------------------------|
| B | Bedding |
| J | Joint |
| Sc | Schistosity |
| Cl | Cleavage |
| BZ | Broken zone/crushed zone |
| F | Fault |
| Fg | Fault with gouge |
| SZ | Shear zone |
| Iz | Infilled seam |
| XD | Extremely weathered seam |
| DD | Drilling - induced defect |



| Weathering | |
|------------|----------------------|
| UW | Unweathered |
| SW | Slightly weathered |
| MW | Moderately weathered |
| HW | Highly weathered |
| CW | Completely weathered |
| RS | Residual soil |

| Defect shape | |
|--------------|------------|
| ST | Stepped |
| UN | Undulating |
| PL | Planar |

| Roughness of defect surface | |
|-----------------------------|--------------|
| R | Rough |
| SM | Smooth |
| SL | Slickensided |

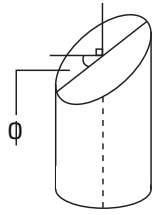
| Field strength | | | |
|----------------|-------------------|-----------|--------------------------|
| | | UCS (MPa) | I ₅₍₅₀₎ (MPa) |
| EW | Extremely weak | < 1 | N/A |
| VW | Very weak | 1 - 5 | N/A |
| W | Weak | 5 - 20 | N/A |
| MS | Moderately strong | 20 - 50 | 1 - 2 |
| S | Strong | 50 - 100 | 2 - 5 |
| VS | Very strong | 100 - 250 | 5 - 10 |
| ES | Extremely strong | > 250 | > 10 |

Defect coding

Type
 Angle (perpendicular to core axis)
J 60°, PL, SL, T, CV, STIFF GREEN CLAY

Infilling description
 (as per soil description)

Infilling/coating type
 Aperture
 Roughness
 Shape



Defect Orientation: for vertical unoriented boreholes defect orientation is measured normal to core axis e.g horizontal = 0°(see diagram). For angled boreholes defect orientation is measured relative to core axis e.g parallel to core axis = 0°.

| Aperture | | |
|-----------|-------------------|---------------|
| | | Aperture (mm) |
| T | Tight | nil |
| VN | Very narrow | 0 - 2 |
| N | Narrow | 2 - 6 |
| MN | Moderately narrow | 6 - 20 |
| MW | Moderately wide | 20 - 60 |
| W | Wide | 60 - 200 |
| VW | Very wide | > 200 |

| Infillings and coatings | | |
|-------------------------|----------------------|---|
| CG | Clay gouge | Joints have openings between opposing faces of intact rock substance in excess of 1 mm filled with clay gouge. Clay is generally described in terms of soil properties. |
| CV | Clay veneers | Joints contain clay coating whose maximum thickness does not exceed 1 mm. Note: Describe clay in terms of soil properties. |
| PL | Penetrative limonite | Joint traces are marked in terms of well defined zones of slightly to moderately weathered ferruginised rock-substance within the adjacent rock. |
| FeSt | Limonite stained | Joint surfaces are stained or coated with limonite, although the rock substance immediately adjacent to the joints is fresh. |
| CT, SC | Coated | Joints exhibit coatings other than clay or limonite, e.g. Carbonate (CT) or Silica (SC). |
| CL, CS, CC | Cemented | Joints are cemented with limonite (CL), Silica (CS), or Carbonates (CC). |
| CN | Clean | Joint surface show no trace of clay, limonite, or other coatings. |

| Spacing | |
|-----------------|--------------|
| Term | Spacing |
| Very wide | > 2 m |
| Wide | 0.6 - 2 m |
| Moderately wide | 200 - 600 mm |
| Close | 60 - 200 mm |
| Very close | 20 - 60 mm |
| Extremely close | > 20 mm |

| Excavator penetration | |
|-----------------------|---|
| Easy | 1 |
| Moderate | 2 |
| Difficult | 3 |

RQD: Rock Quality Designation - percentage of core run consisting of sound rock longer than 10 cm.

BH1 Log

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 1 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|--|---|-----------------|---------------|-----------------|-------------------|--------------------------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Fill | 0.0m: Fine to coarse GRAVEL; trace wood, trace light brown clay; grey. Loosely packed, wet [roading material] | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| Residual Soil | 0.3m: No Recovery (core loss) | | UW | US | HQTT | 0 | | 147 | | | | | | | | | | | | |
| | 1.5m: Push Tube | | UW | US | PT | 100 | | | | | | | | | | | | | | |
| | 2.0m: CLAY, some silt; orange brown mottled grey. Stiff, wet, high plasticity | | UW | US | SPT | 77 | 0/1 1/1 1/1 N=4 | | 146 | | | | | | | | | | | |
| | 2.35m: No recovery (core loss) | | UW | US | | | | | | | | | | | | | | | | |
| | 2.45m: CLAY, some silt; orange brown mottled light grey, trace light pink streaks. Stiff, wet, high plasticity | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 2.8m: Sandy CLAY, some silt; light brown mottled orange brown. Firm, wet, moderate to high plasticity. Sand, fine | | UW | US | SPT | 100 | 28/11 kPa | | 145 | | | | | | | | | | | |
| | 3.0m: Silty CLAY; orange brown mottled grey. Firm, wet, high plasticity | | UW | US | SPT | 100 | 0/0 0/0 0/0 N=0 | | | | | | | | | | | | | |
| | 3.7m: Sandy CLAY, minor silt, with some thin (100mm) beds of CLAY minor silt; grey minor orange brown mottles. Firm to stiff, wet, moderate to high plasticity. Sand, fine | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 4.0m: CLAY, minor silt some thin bands of sandy clay; reddish brown, mottled light grey. Stiff, wet, high plasticity | | UW | US | HQTT | 100 | | | 144 | | | | | | | | | | | |
| | 4.15m: Minor fine to medium gravel, black staining | | UW | US | | | | | | | | | | | | | | | | |
| 4.15m: Sandy SILT, minor clay, reddish brown. Stiff, saturated, low plasticity. From 4.25m becoming silty fine SAND; reddish brown. Loose, wet | | UW | US | | | | | | | | | | | | | | | | | |
| 4.5m: Push Tube | | UW | US | PT | 100 | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Box 1, 0.0-4.5m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 2 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|--|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| CW Pakiri | 5.0m: Fine SAND, trace silt; brown minor orange brown to reddish brown laminations, trace carbonaceous laminations. Medium dense, wet. | | | | SPT | 100 | 2/1 3/4 4/6 N=17 | | 5.5 | | | | | | | | | | | |
| | 5.45-5.75m: Reddish brown | | | | HQTT | 100 | | | 6.0 | | | | | | | | | | | |
| | 6.0m: Light brown, with reddish brown and black staining | | | | SPT | 100 | 120/18 kPa 1/2 2/3 3/4 N=12 | | 6.5 | | | | | | | | | | | |
| | 6.45m: Silty fine SAND; brown, with orange brown and reddish brown, and trace black staining. Medium dense, wet. | | | | HQTT | 100 | | | 7.0 | | | | | | | | | | | |
| | 6.75m: Fine SAND, minor medium to coarse SAND | | | | SPT | 100 | UTP 2/2 3/3 3/3 N=12 | | 7.5 | | | | | | | | | | | |
| | 6.75m: Fine SAND, trace to minor silt; brown, minor orange brown and black (carbonaceous) laminations. Medium dense, wet | | | | HQTT | 100 | | 8.0 | | | | | | | | | | | | |
| | 9.0m: Silty fine SAND; brown, minor reddish brown and black staining. Loose, wet | | | | SPT | 100 | 1/2 2/2 2/3 N=9 | | 9.0 | | | | | | | | | | | |
| | 9.60m: Reddish brown staining along defect | | | | | | | 9.5 | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 3 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|---|---------------|-----------------|-------------------|---------------------------|--------|-----------|-------------|------------|-----------------------|---------|---|----------------------------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering LW MW HW CW US MS HS CS UW MW HW CW EW | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) 25 50 75 | Water Level | Casing | Installation | Core Box No | |
| CW Pakiri | 10.0m: Fine to medium SAND, trace silt; brown, minor orange brown and black (carbonaceous) laminations. Medium dense, wet | | | HQTT | 100 | | | 10.5 | | | | | | | | | | | |
| | 11.0m: Silty fine SAND; light brown, minor orange brown and black (carbonaceous) laminations. Medium dense, wet 11.28 - 11.30m: Fine to medium SAND; brown | | | SPT | 100 | 2/3 4/5 5/4 N=18 | 137 | 11.0 | | | | | | | | | | | |
| HW Pakiri | 11.3m: Highly weathered, light brown mottled orange brown SILTSTONE. Extremely weak. [SILT, minor fine sand. Very Stiff, wet, low plasticity] | | | HQTT | 100 | | | 11.5 | | | 19 | | | | | | | | |
| | 11.65m: Highly weathered, light brown and orange brown, fine to medium SANDSTONE. Extremely weak. [Fine to medium SAND, trace silt. Tightly packed, wet]. 11.75m-11.8m: Dark orange brown and brown | | | | | | 136 | 12.0 | | | | | | | | | | | |
| | 11.8m: Highly weathered, light brown and orange brown, fine SANDSTONE, minor thin (50mm) to moderately thick (250mm) beds of highly weathered, grey, SILTSTONE. Extremely weak. [Interbedded fine SAND and SILT] | | | | | | | 135 | 13.0 | | | | 12.30m: BZ, Rec as f-m angular gvl 12.70m: J, 0° dip, PL, SL, N, FeSt 12.80m: J, 5° dip, PL, SM, T 13.00m: J, 90° dip, UN, R, VN, FeSt 13.02m: J, 30° dip, PL, R, VN, FeSt 13.20m: J, 70° dip, UN, R, VN, FeSt 13.35m: J, 60° dip, UN, SL, VN, FeSt, polished 13.45m: J, VCS, 70, UN, SL to SM, VN, black (carbonaceous staining) 13.50 - 13.80m: J, 70 to 85, UN, R to PL, R, VN, FeSt | | | | | | |
| | 12.9m: Highly weathered fine to medium SANDSTONE. Extremely weak. [Fine to medium SAND, minor silt. Tightly packed, wet] | | | HQTT | 100 | | | 135 | 13.5 | | | | | | | | | | |
| | 13.5m: Highly weathered fine to coarse SANDSTONE. Extremely weak to very weak. [Fine to coarse SAND, trace silt. Tightly packed, wet] | | | | | | | 134 | 14.0 | | | | | | | | | | |
| | 14.5m: Extremely weak. Recovered as fine to coarse SAND 14.6m: Highly weathered fine to coarse SANDSTONE. Extremely weak. Discontinuities very closely spaced. [Fine to coarse SAND, trace silt. Tightly packed, wet] | | | HQTT | 100 | | | 133 | 14.5 | | | 20 | 14.00 - 14.50m: J, VCS, 60 to 80, UN, SM, VN, FeSt 14.10 - 14.50m: J, Orthog, 80 deg, UN, R, VN, FeSt 14.50 - 14.95m: J, 90° dip, UN, R, Open, FeSt 14.95 - 15.10m: J, VCS, orthog, UN, R to ST, SM, VN, FeSt | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 4 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|--|----------------|-------------|--------|--------------|-------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| HW Pakiri | 15.0m: Highly weathered fine SANDSTONE. Extremely weak. [Fine SAND, minor silt. Tightly packed, wet] | | UW | US | HQTT | 100 | | 132 | 15.0 | | | 63 | 15.20m: J, 0° dip, UN, SM, T, FeSt 15.30 - 15.35m: BZ, 0° dip, UN, R, VN, orthogonal 60 and 70 deg, ST, SM & UN, SM | | | | | | Box 5, 12.7-15.7m | |
| | 15.1m: Moderately weathered, grey, SILTSTONE. Extremely weak. [SILT, hard, fissile] | | UW | US | | | | | | | | | 15.70m: J, 80° dip, UN, SM, T, FeSt 15.85m: J, 70° dip, UN, R, T, FeSt | | | | | | | |
| | 15.2m: Moderately weathered, grey, fine SANDSTONE, grading to fine to coarse SANDSTONE from 15.4m. Extremely weak. [Fine SAND, grading to fine to coarse sand. Tightly packed, wet] | | UW | US | | | | | | | | | 16.05m: J, -70° dip, UN, R, T, FeSt 16.20m: BF, 2° dip, PL, R, T, CN 16.21m: J, 5° dip, UN, SM, VN, FeSt 16.25m: J, Orthog, 0, UN, SM & 60, UN, R, T to VN, FeSt 16.40m: J, 0, UN, SL, VN, FeSt | | | | | | | |
| | 16.2m: Moderately weathered, dark grey, SILTSTONE. Extremely weak | | UW | US | | | | | | | | | 16.75m: J, Orthog 60 deg, UN, SM, VN, FeSt | | | | | | | |
| | 16.25m: Moderately weathered, brown, fine grading fine to coarse SANDSTONE from 16.5m. Extremely weak to very weak. | | UW | US | | | | | | | | | 17.00 - 17.12m: J, VCS, 0 to 40 deg, UN, SL to R, VN, FeSt 17.12 - 17.14m: BZ 17.14 - 17.35m: J, VCS, orthog, 70 deg, PL, SM to UN, SL, T to VN, black st (manganese), FeSt | | | | | | | |
| | 17.0m: Moderately weathered, brown, SILTSTONE. Extremely weak to very weak | | UW | US | | | | | | | | | 53 | 17.60m: J, 3° dip, ST, SL, VN, FeSt 17.80m: J, 15° dip, UN, R, VN, FeSt 17.85m: J, 85° dip, UN, SM, T, FeSt | | | | | | |
| | 17.3m: Moderately weathered brown fine SANDSTONE, minor very thin (10mm to 60mm) beds of dark grey SILTSTONE. Extremely weak to very weak | | UW | US | | | | | | | | | 0 | 17.90m: J, 2, ST, SM, VN, FeSt 17.95m: J, 90° dip, UN, R, VN, FeSt | | | | | | |
| | 18.0m: No recovery (core loss) | | UW | US | | | | | | | | | 0 | | | | | | | |
| | 19.1m: Highly weathered brown with minor reddish brown streaks fine to medium SANDSTONE. Extremely weak [rock disintegrates into fine to medium SAND, trace silt with light pressure] | | UW | US | | | | | | | | | 0 | 19.10 - 19.30m: BZ, Recovered as fine to coarse gravel 19.30 - 19.50m: J, ExCS, anastomatic 60 to 90, UN, SL to PL, R, VN, FeSt | | | | | | |
| | 19.5: No Recovery (core loss) | | UW | US | | | | | | | | | 0 | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 5 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| HW Pakiri | 20.0m: No recovery (core loss) | | UW | US | HQTT | 26 | | 20.5 | | | 0 | | | | | | | | |
| | 20.6m: Highly weathered brown fine to coarse SANDSTONE. Extremely weak. [Recovered as silty fine to coarse SAND. Wet] 20.75 - 20.95m: Brownish grey, fine to coarse SANDSTONE. Extremely weak. [breaks down with light to moderate pressure by hand to a silty fine to coarse SAND] | | UW | US | HQTT | 100 | | 127 | 21.0 | | | 26 | 20.60 - 21.00m: BZ, Dominant ExCS 60, UN, R, T, CN to FeSt | | | | | | |
| | 21.1m: Highly weathered, brown with reddish brown staining, fine to medium SANDSTONE. Extremely weak 21.45 - 21.55m: Light greyish brown, fine to coarse, SANDSTONE. Extremely weak [rock disintegrates easily by hand to fine to medium SAND, trace coarse sand and fine gravel] | | UW | US | HQTT | 100 | | 125 | 21.5 | | | 60 | 21.10m: J, 5° dip, ST, R, VN, FeSt 21.10 - 21.28m: J, VCS, UN, SM to R, VN, FeSt 21.28 - 21.35m: J, ExCS, UN, SM, VN, FeSt 21.45m: J, Orthog, 70, UN, R, T to VN, CN to FeSt 21.55m: J, 50° dip, UN, R, VN, FeSt | | | | | | |
| MW Pakiri | 21.55m: Moderately weathered, brown, fine to coarse SANDSTONE. Very weak. | | UW | US | HQTT | 100 | | 126 | 22.0 | | | 60 | 21.75 - 21.76m: J, 55° dip, UN, R, VN, FeSt (2x ExCS) 21.85m: DD, 30° dip, UN, R, T, CN 21.90 - 21.95m: J, ExCS, 50 to 70, UN, SM, VN to N, FeSt 22.10m: J, -50° dip, UN, R, T, CN | | | | | | |
| | 21.75m-22.1m: Slightly weathered, dark blue grey, fine to medium SANDSTONE | | UW | US | HQTT | 100 | | 125 | 22.5 | | | 30 | 22.20m: J, -50° dip, UN, SM, VN, FeSt 22.25m: J, 60° dip, UN, R, VN, FeSt, Black (manganese? specks) 22.30 - 22.32m: BF, ExCS, 0, UN, SM, VN to N, FeSt 22.60m: J, Orthog, 20 & 50, UN, R, VN, FeSt | | | | | | |
| | 22.3 - 22.32m: SILTSTONE | | UW | US | HQTT | 100 | | 124 | 23.0 | | | 53 | 22.70 - 22.75m: BZ, Rec c gvl 22.75m: BF, 0° dip, UN, SM, VN, FeSt, brown sandy silt veneer 22.95m: J, Orthog 70 and 80, UN, R, T to VN, FeSt 23.05 - 23.15m: J, ExCS, 40 to 70, UN, SM to R, T, FeSt | | | | | | |
| | 22.7-22.75m: SILTSTONE | | UW | US | HQTT | 100 | | 123 | 23.5 | | | 53 | 23.26 - 23.33m: BZ 23.40 - 23.60m: J, VCS, 60, UN, R, T, FeSt | | | | | | |
| | 22.8m-23.05m: Slightly weathered blue-grey fine to coarse SANDSTONE | | UW | US | HQTT | 100 | | 124 | 24.0 | | | 53 | 23.80m: J, 50° dip, UN, R, T, FeSt, black (manganese) st 23.95m: J, 5° dip, UN, R, T, FeSt | | | | | | |
| | 23.26m-23.33m: SILTSTONE | | UW | US | HQTT | 100 | | 123 | 24.5 | | | 53 | 24.20m: J, 60° dip, PL,R,T,FeSt 24.22m: J, 10° dip, UN,SM,T,FeSt 24.40m: J, 40° dip, to 70, UN, R, T, FeSt, black st 24.47m: J, 60° dip, UN, R, T, black st 24.55m: DD 24.60m: J, ExCS, 60 to 90, PL, R & UN, R, T, FeSt 24.75m: J, 80° dip, UN,R,T,FeSt 24.87m: BF, 10, UN,SM,T,FeSt 24.92 - 24.95m: BZ | | | | | | |
| | 24.82m-24.87m: Fine SANDSTONE 24.93m-24.95m: SILTSTONE | | UW | US | HQTT | 100 | | 123 | 24.9 | | | 53 | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Box 7, 19.5-23.4m



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 6 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
(NZTM2000) 1741422.54 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
R.L. COLLAR: 148.00m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|--|--------|-----------|-------------|--------------------------|-----------------------|--|---|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| MW Pakiri | 25.0m: Moderately weathered, brown fine to coarse SANDSTONE. Very weak. Discontinuities closely spaced. | | UW | US | HQTT | 100 | | | | | 2000 600 200 20 | 53 | 25.10 - 25.50m: J, CS, 5 to 50, UN, SM to R, T, FeSt to CN | | | | | | | |
| | | | | | | | | 25.5 | | | | | 25.50 - 25.65m: J, VCS to ExCS, 50 to 60, PL, R to UN, R, T, FeSt | | | | | | | |
| | | | | | | | | 122 | | | | | 25.80 - 25.90m: J, CS, 30 to 70, UN, R, T, FeSt | | | | | | | |
| | 26.45 - 26.47m: SILTSTONE 26.47 - 26.52m: Fine SANDSTONE | | | | | | | 26.0 | | | | | 83 | 26.00m: J, 70° dip, UN, SM, VN, black st, minor FeSt 26.10m: J, 20-50, UN, R, T, black st | | | | | | |
| | 26.52m: Moderately weathered brown fine to medium SANDSTONE. Extremely weak to very weak | | | | | | | 26.5 | | | | | | 26.35 - 26.65m: J, Orthog, 60, UN, SM, T to VN, black st, FeSt | | | | | | |
| | | | | | | | | 121 | | | | | | 26.75 - 26.85m: J, ExCS, 70, UN, SM, T, FeSt 26.90m: J, 80° dip, UN, SM, T, black st | | | | | | |
| | 27.0m-27.1m: Moderately weathered, brown, fine SANDSTONE | | | | | | | 27.0 | | | | | | 27.00 - 27.10m: BZ, Orthog 70 & 50, UN, SM, PL, R, T to VN, FeSt 27.10 - 27.15m: J, VCS, 0-20, UN, SM, T, FeSt 27.30m: J, 70° dip, UN, R, T, black st, FeSt | | | | | | |
| | | | | | | | | 27.5 | | | | | | 27.45 - 27.75m: J, VCS, 0-5, UN, SM to R, T, FeSt, orthogonal 60, PL, R & 90, UN, SM, FeSt | | | | | | |
| | 27.7m-27.75m: Moderately weathered, grey SILTSTONE. Very weak 27.75m-27.79m: Black carbonaceous laminations | | | | | | | 120 | | | | | | 27.98m: J, Orthog, 70, Wavy, UN, SM to R, VN to T, black St, FeSt 28.10m: J, 40° dip, UN, R, T, black st, FeSt | | | | | | |
| | | | | | | | | 28.0 | | | | | | 28.30 - 28.50m: J, 80° dip, UN, SM, VN, FeSt | | | | | | |
| | | | | | | | 119 | | | | | | 28.75 - 29.05m: J, Orthog, 60, - 60 & 90, UN, SM to PL, R, T, black st | | | | | | | |
| | | | | | | | 28.5 | | | | | | 29.15 - 29.50m: J, Orthog, 70-80, ExCS, UN, SM, VN, brown silt, black st, FeSt 29.50m: J, 50° dip, and orthog 60 dip, UN, SM, VN, brown sandy silt, FeSt 29.70m: J, 50° dip, UN, SM, T, FeSt | | | | | | | |
| | | | | | | | 118 | | | | | | 29.75m: J, 50° dip, UN, SM, T, FeSt | | | | | | | |
| | | | | | | | 29.5 | | | | | | | | | | | | | |
| | | | | | | | 29.0 | | | | | | | | | | | | | |
| | | | | | | | 29.7m-30.0m: Dark grey with black carbonaceous laminations from 29.7m to 29.83m. | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 7 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|--|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| MW Pakiri | 30.0m: Moderately weathered, light brownish grey, fine to medium SANDSTONE. Very weak. | | | | | | | | | | | | | | | | | | | |
| | 30.3-30.4m: Lense of brown, fine to medium, SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 30.4m: Light brown | | | | | | | | | | | | | | | | | | | |
| | 31.25m: Light brownish grey | | | | | | | | | | | | | | | | | | | |
| | 31.1m-31.12m: SILTSTONE | | | | | | | | | | | | | | | | | | | |
| | 31.99m-32.05m: Moderately weathered dark grey SILTSTONE. Very weak | | | | | | | | | | | | | | | | | | | |
| | 32.65-33.0m: Moderately weathered, light brown, fine SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 33.3m: Moderately weathered, brown, fine to coarse SANDSTONE. Extremely weak | | | | | | | | | | | | | | | | | | | |
| | 34.1-34.2m: Coarse SANDSTONE. Extremely weak | | | | | | | | | | | | | | | | | | | |
| | 34.2m-34.5m: Fine SANDSTONE. Extremely weak | | | | | | | | | | | | | | | | | | | |
| 34.5-34.9m: Moderately weathered, light grey fine SANDSTONE. Very weak | | | | | | | | | | | | | | | | | | | | |
| 34.9m-35.1m: Moderately weathered, dark brown, fine SANDSTONE | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Box 10, 29.0-31.8m

Box 11, 31.8-34.5m

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 8 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|--------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| MW Pakiri | 34.9-35.1 [Cont'd] MW, dark brown fine SANDSTONE interbedded with light greyish brown fine SANDSTONE. Extremely weak. | | | | HQTT | 100 | | | | | | 43 | UN, SL to SM, brown silt | | | | | | | |
| | 35.1m: Moderately weathered, brown, fine to medium SANDSTONE. Extremely weak to very weak. | | | | | | | | | | | | 35.10 - 35.25m: J, 70° dip, ExCS to VCS, UN, SM, VN to N, brown silty sand, FeSt | | | | | | | 35.25 - 35.45m: BZ |
| | 35.25m-35.45m: Fine SANDSTONE | | | | | | | | | | | | 35.45 - 35.90m: J, 90° dip, VCS, UN, SM, VN, CN to FeSt | | | | | | | |
| | 35.45m to 35.9m: Fine to coarse SANDSTONE | | | | | | | | | | | | 35.90 - 36.00m: BZ, ExCS, 70 to 90, UN, SL to SM, VN, FeSt, black st | | | | | | | |
| | 35.9m: Grey SILTSTONE with thin lenses of brown fine SANDSTONE. Extremely weak to very weak | | | | | | | | | | | | 36.10 - 36.40m: SZ, 90° dip, UN, SM to SL, Open, brown silty SAND with angular f-m gvl | | | | | | | |
| | 36.1m: Brown, fine to medium, SANDSTONE. Extremely weak to very weak | | | | | | | | | | | | 36.40m: J, -50° dip, PL, R, VN, black st | | | | | | | |
| | 36.4-36.55m: Recovered as fine to medium SAND, wet. | | | | | | | | | | | | 36.55m: J, 50° dip, PL, R, VN | | | | | | | |
| | 36.55m: Brown, fine to coarse SANDSTONE, becoming fine to medium SANDSTONE from 36.7m. Extremely weak | | | | | | | | | | | | 36.70 - 36.90m: BZ, Rec m-c angular gvl | | | | | | | |
| | 36.9m: No Recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 37.25m: Moderately weathered, brown, fine to medium SANDSTONE. Very weak. | | | | | | | | | | | | 37.25 - 37.50m: J, 50° dip, VCS, UN, SM, VN, FeSt | | | | | | | |
| | 37.5m: Moderately weathered, brown fine to coarse SANDSTONE. Very weak | | | | | | | | | | | | 37.60 - 37.61m: J, 60° dip, UN, SM, VN, CN to FeSt & black st | | | | | | | |
| | | | | | | | | | | | | | 37.75m: J, -20° dip, UN, SM, VN, FeSt | | | | | | | |
| | 38.4m: Moderately weathered, brown, fine SANDSTONE. Very weak | | | | | | | | | | | | 37.85 - 38.10m: J, 90° dip, UN, R, VN, FeSt | | | | | | | |
| 38.62m: Moderately weathered, brown, fine to medium SANDSTONE. Very weak | | 37.85m: J, 70° dip, UN, SM, VN, FeSt | | | | | | | | | | | | | | | | | | |
| | | 38.15m: J, 60° dip, UN, R, VN, minor FeSt | | | | | | | | | | | | | | | | | | |
| | | 38.20m: J, 20° dip, UN, R, VN, minor FeSt | | | | | | | | | | | | | | | | | | |
| | | 38.25 - 38.75m: J, 80° dip, VCS, UN, SL to PL, R, T to N, black st & FeSt | | | | | | | | | | | | | | | | | | |
| | | 38.80m: J, 90° dip, UN, SM, T, VN, black st | | | | | | | | | | | | | | | | | | |
| | | 38.90m: J, -60° dip, UN, SM, VN, CN minor black st | | | | | | | | | | | | | | | | | | |
| | | 38.95 - 39.15m: J, 80° dip, & Orthog 80, UN, SM, black st, FeSt | | | | | | | | | | | | | | | | | | |
| | | 39.15 - 39.35m: J, 90° dip, VCS, UN, SM, T, black st | | | | | | | | | | | | | | | | | | |
| | | 39.30 - 39.90m: J, 70° dip, VCS, UN, SM, T, FeSt | | | | | | | | | | | | | | | | | | |
| | | 39.60 - 39.85m: J, 90° dip, UN, SM, VN, FeSt | | | | | | | | | | | | | | | | | | |
| | | 39.85m: J, 60° dip, PL, SM, VN, FeSt, faint striations (slickensided) | | | | | | | | | | | | | | | | | | |
| 39.9m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 9 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|--|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| MW Pakiri | 40.0m: No recovery (core loss) | | UW | US | HQTT | 60 | | | | | | | | | | | | | | |
| | 40.5m: Moderately weathered, light brown, fine SANDSTONE. Very weak | | UW | US | HQTT | 100 | | 40.5 | | | | | | 40.50 - 40.65m: BZ, Rec f-c gvl | | | | | | |
| | 40.75m: Moderately weathered, brown, fine to medium SANDSTONE. Very weak | | UW | US | HQTT | 100 | | 41.0 | | | | | | 40.65 - 41.05m: J, 85° dip, PL, R, T, FeSt 40.65m: J, 20° dip, UN, SM to PL, SM, FeSt 40.75m: BF, 0° dip, UN, SL, T, FeSr 41.05 - 41.20m: BZ 41.20m: J, Orthog 5, UN, SL, FeSt, 70, UN, R, VN & 90, ST, SM, T, FeSt | | | | | | |
| SW Pakiri | 40.9m to 42.1m: Moderately weathered, interbedded grey SILTSTONE with thin light brown fine sandstone laminations and brown fine SANDSTONE. Very weak | | UW | US | HQTT | 100 | | 41.5 | | | | | 41.25 - 41.60m: J, 80° dip, VCS, UN, SM, VN, FeSt | | | | | | | |
| | 42.1m: Slightly weathered, grey, minor orange brown staining, fine SANDSTONE. Very weak | | UW | US | HQTT | 100 | | 42.0 | | | | | 41.60 - 41.72m: BZ 41.80 - 41.86m: BZ 41.90 - 42.10m: BZ | | | | | | | |
| UW Pakiri | 42.3m: Unweathered, grey, fine SANDSTONE with thin black carbonaceous laminae. Weak | | UW | US | HQTT | 100 | | 42.5 | | | | | 42.25m: J, 60° dip, UN, SM, VN, FeSt | | | | | | | |
| | 42.45m: Unweathered, dark grey SILTSTONE and fine grained SANDSTONE. Weak. Beds are moderately thin to moderately thick (100mm to 350mm) | | UW | US | HQTT | 100 | | 43.0 | | | | | 42.44m: J, 2° dip, UN, SM, T, CN 42.45m: BF, 2° dip, UN, SL, T, CN | | | | | | | |
| | | | UW | US | HQTT | 100 | | 43.5 | | | | | 43.00m: BF, 0° dip, ST, SM, T, CN 43.15m: BF, 1° dip, PL, R to UN, SM, T, CN 43.30m: BF, 0° dip, ST, SM, T, CN 43.38m: BZ, 0° dip, UN, SM, T, CN | | | | | | | |
| | | | UW | US | HQTT | 100 | | 44.0 | | | | | 43.60m: J, 10° dip, UN, SM, T, CN 43.80m: J, 60° dip, UN, SM, T, VN, CN 43.85m: J, -70° dip, PL, R, T, CN 43.90 - 44.20m: J, 85° dip, PL, R, T, CN | | | | | | | |
| | | | UW | US | HQTT | 100 | | 44.5 | | | | | 44.20m: J, 0° dip, UN, SM 44.35m: J, 60° dip, UN, SM, T, CN 44.50m: J, 0° dip, ST, SM, T, CN 44.77 - 44.83m: J, ExCS, 0 - 20, UN, SM, T, CN 44.80m: J, 0° dip, UN, SL, VN, grey silt | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH1

SHEET: 10 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 19/03/2018

FINISH DATE: 23/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977896.86 mN
 (NZTM2000) 1741422.54 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 148.00m
 R.L. COLLAR: 148.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | |
|----------------------|--|---|---|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|---|------|------------------------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | |
| UW Pakiri | 45.0m: Unweathered interbedded dark grey SILSTSTONE and fine grained SANDSTONE. Weak | | UW | MS | HQTT | 100 | | | 45.0 | | 2000 | 84 | 45.00 - 45.20m: J, 90° dip, & orthog 90, PL, R, T, black staining to 45.1m | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 45.20m: J, 0° dip, UN, SM, VN, CN | | | |
| | | | | | | | | | | | | | | | | | | | | 45.35m: J, 70° dip, UN, SM, T, FeSt | | | |
| | | | | | | | | | | | | | | | | | | | | 45.40m: J, 50° dip, UN, SM, T, CN | | | |
| | | | | | | | | | | | | | | | | | | | | 45.60m: DD, 0° dip | | | |
| | | | | | | | | | | | | | | | | | | | | 45.70m: J, 80° dip, Wavy PL, R, T, CN & orthog 80, ST, SM, T, CN | | | |
| | | | | | | | | | | | | | | | | | | | | 46.0 | 102 | 46.0 | 46.25m: J, 70° dip, UN, SM, VN, CN |
| | | | | | | | | | | | | | | | | | | | | 46.5 | 46.30 - 46.40m: BZ, Orthog, 20 to 90, UN, SM, T, CN & PL, R, N, grey silt | | |
| | | | | | | | | | | | | | | | | | | | | 46.40 - 46.70m: J | | | |
| | | | | | | | | | | | | | | | | | | | | 47.0 | 101 | 47.0 | 47.10m: J, 60° dip, UN, R, T, CN |
| 47.5 | 47.40m: J, 80° dip, VCS, UN, SM, T, CN | | | | | | | | | | | | | | | | | | | | | | |
| 48.0 | 100 | 48.0 | 47.80 - 48.40m: J, 80° dip, VCS, UN, SM, VN, CN minor grey silt | | | | | | | | | | | | | | | | | | | | |
| 48.5 | 48.40 - 49.10m: J, 80° dip, VCS, UN, SM, VN, CN minor grey silt | | | | | | | | | | | | | | | | | | | | | | |
| 49.0 | 99 | 49.0 | 49.10m: J, 60° dip, UN, SL, T - VN, CN | | | | | | | | | | | | | | | | | | | | |
| 49.5 | 49.25m: J, 30° dip, Wavy, PL, R, T, CN | | | | | | | | | | | | | | | | | | | | | | |
| 49.99m: Target depth | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Mon 9 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.99m

Scale 1:25

Rev.: A

General Log - 5/04/2019 11:16:26 a.m. - Produced with Core-GS by GeRoc

Box 15, 43.6-46.3m
Box 16, 46.3-49.1m
Box 17, 49.1-50.0m

BH2 Log

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 1 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | |
|-----------------|--|--|--|-----------------|-------------------|---------------------------|--------|-----------|-------------|------------|-----------------------|---------|--|----------------------------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering UW W MW M CW C | Rock Strength US S MS M ES E EW EW | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) 25 50 75 | Water Level | Casing | Installation | Core Box No |
| Fill | 0.0m: Fine to coarse angular GRAVEL, some sand, minor silt. Brown. Tightly packed, wet. | | | | | | 204 | | | | | | | | | | | |
| | 0.1m: BOULDER; brown. Boulder is moderately weathered, brown, fine to coarse SANDSTONE. Weak. | | | | | | 204 | | | | | | 0.30m: J, 25° dip, UN, SM, VN, FeSt 0.35 - 0.61m: BZ 0.35m: J, 10° dip, UN, SM, VN, FeSt 0.64m: J, 10, UN, SM, VN, CN 0.68 - 0.70m: J, 10 to 15, UN, SM, VN, CN 0.85m: J, 15° dip, UN, SM, VN, FeSt | | | | | |
| | 2.16m: Silty fine SAND; light brown mottled orange brown. Loose, moist to wet | | | HQTT | 100 | | 202 | | | | | | 1.23m: J, 10, UN, SM, VN, FeSt 1.23 - 1.40m: BZ 1.40m: J, 15, UN, SM, VN, CN 1.52m: J, 15, UN, SM, VN, FeSt 1.58m: J, 10, UN, SM, VN, FeSt 1.68m: J, 30° dip, UN, SM, VN, CN 1.80m: J, 25° dip, UN, SM, VN, FeSt 1.84 - 1.90m: J, 25 to 35, UN, SM, VN to N, FeSt 1.96m: J, 60° dip, UN, SM, VN to N, FeSt 1.96 - 2.15m: BZ | | | | | |
| | 2.45m: No recovery (core loss) | | | | | | 2.5 | | | | | | | | | | | |
| Residual Soil | 3.0m: Silty fine SAND; brown. Loose to medium dense, moist to wet | | | SPT | 100 | 1/2 2/2 3/3 N=10 | 201 | | | | | | | | | | | |
| | 4.05m: Fine to medium SAND; light brown mottled orange brown. Loose to medium dense, moist to wet | | | HQTT | 61 | | 200 | | | | | | | | | | | |
| | 4.5m: Fine to medium SAND; light brown mottled orange brown. Medium, dense, moist to wet | | | SPT | 100 | 2/2 4/4 5/4 N=17 | 4.5 | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-3.9m

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 2 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------------------------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| CW Pakiri | 4.94m [Cont'd]: Fine SAND, trace silt; light greyish brown mottled orange brown. Medium dense, moist to wet | | | | HQTT | 100 | | 199 | 5.5 | | | | | | | | | | |
| | 6.1m: Interbedded SILT; light greyish brown mottled orange brown, stiff to very stiff, moist, low plasticity and fine SAND; light greyish brown, loose to medium dense, moist. Moderately thinly bedded. | | | | SPT | 100 | 1/1 2/3 3/3 N=11 | 198 | 6.0 | | | | | | | | | | |
| | 7.45m: Clayey SILT; light greyish brown. Stiff to very stiff, moist, low to moderate plasticity | | | | SPT | 100 | 1/2 3/4 7/8 N=22 | 197 | 7.5 | | | | | | | | | | |
| MW-HW Pakiri | 7.95m: Moderately weathered to highly weathered, brown, SILTSTONE. Very weak to weak | | | | | | | 196 | 8.0 | | | | | | | | | | |
| | 8.15m: Moderately weathered to highly weathered, brown, fine to coarse SANDSTONE. Very weak to weak | | | | | | | | | | | | | | | | | | |
| | 8.3m: Becomes brown and grey | | | | HQTT | 100 | | | 8.5 | | | | | | | | | | |
| | 8.61m to 8.71m: Highly weathered | | | | | | | | | | | | | | | | | | |
| SW Pakiri | 8.74m to 9.40m: Moderately weathered | | | | | | | 195 | 9.0 | | | | | | | | | | |
| | 9.4m: Slightly weathered, grey SILTSTONE. Weak | | | | | | | | 9.5 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

12/04/2018, 6.54m

Box 2, 3.9-7.5m

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 3 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|--|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------------------------|--|--|---------------------------------------|----------------|-------------|--------|------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| SW Pakiri | 9.4m: [Cont'd]: Slightly weathered, grey SILTSTONE. Weak | | UW | MS | HQTT | 100 | | 194 | 10.5 | | 2000 600 200 50 20 | 54 | 10.03m: J, 45° dip, UN, SM, VN, CN 10.15m: J, 15° dip, UN, SM, VN, CN 10.27m: J, 15° dip, ST, SM, VN to N, CN 10.39m: J, 20° dip, UN, SM, VN to N, CN 10.50m: DD 10.61m: J, 10, UN, SM, VN, FeSt 10.70m: J, 10, UN, SM, VN, CN 10.75 - 10.85m: BZ | 25 50 75 | | | | Box 3, 7.5-10.5m | |
| | 11.6m: Slightly weathered, grey, fine SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 193 | 11.5 | | | 54 | 10.95m: J, 15° dip, UN, SM, VN to N, CN 11.03 - 11.13m: BZ 11.25m: J, 15° dip, PL, SM, VN-N, CN 11.37m: J, 15° dip, UN, SM, VN to N, CN 11.48m: J, 15° dip, PL, SM, VN to N, CN 11.58m: J, 15° dip, UN, SM, VN to N, CN 11.68m: J, 15° dip, UN, SM, VN to N, CN 11.84m: J, 15° dip, PL, SM, VN to N, CN | | | | | | |
| | 11.90 - 12.00m: Brown, fine SANDSTONE. Very weak | | UW | MS | HQTT | 100 | | 192 | 12.0 | | | 83 | 11.90m: J, 15° dip, PL, SM, VN to N, FeSt 11.93 - 11.96m: BZ 12.13m: J, 20° dip, UN, SM, VN, CN 12.19m: J, 35° dip, UN, SM, VN, CN 12.31m: J, 15° dip, UN, R, VN, CN 12.52 - 12.54m: J, 10 to 15, UN, SM to R, VN, CN 12.64m: J, 20° dip, UN, SM, VN, CN | | | | | | |
| | 12.0m: Slightly weathered, grey fine to coarse SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 191 | 12.5 | | | 83 | 13.00m: J, 20° dip, UN, SM, VN, FeSt 13.03m: J, 10° dip, UN, SM, VN to N, FeSt | | | | | | |
| | 12.52m: Slightly weathered, grey, fine to medium SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 190 | 13.0 | | | 90 | 13.80m: J, 30° dip, VCS, UN, SM, VN, FeSt 14.00 - 14.25m: J, 70° dip, UN, R, VN, FeSt 14.50 - 14.55m: J, Orthog, 10 to 30, UN, SM, VN, Upper contact 30, UN, SM, VN, brown silt. Lower contact 30, UN, SM, N-VN, dark brown sandy silt, FeSt | | | | | | |
| 13.5m: Slightly weathered, grey fine to coarse SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 190 | 14.0 | | | 90 | 14.90m: BF, 20° dip, UN, SM, VN, grey sandy silt 14.93m: BF, 20° dip, UN, SM, VN, trace grey silt | | | | | | | |
| 14.9m to 15.0m: Carbonaceous fine to medium SANDSTONE | | UW | MS | HQTT | 100 | | 190 | 14.5 | | | 90 | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 4 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--|-----------------------|---|---------------------------------------|----------------|-------------|--------|-------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | |
| UW-SW Pakiri | 15.0m: Unweathered to slightly weathered, grey, carbonaceous, fine to medium SANDSTONE. Weak to moderately strong 15.20 - 15.40m: 15.2m: Grey, fine to medium SANDSTONE | | UW | SM | HQTT | 100 | | 189 | 15.5 | | 2000 600 400 200 100 50 20 | 93 | 15.15m: J, 25° dip, UN, SM, VN, minor FeSt, 1cm carbonaceous layer 15.38m: J, 60° dip, UN, SL, T, CN 15.40m: BF, 15° dip, UN, SL, VN, grey silty fine sand 15.50m: BF, 20° dip, PL, R, VN, FeSt 15.58 - 15.59m: J, 20° dip, ExCS, PL, R, VN, CN 15.65m: DD | 25 50 75 | | | | Box 5, 13.2-15.5m | |
| | 15.4m: Unweathered to slightly weathered, grey SILTSTONE, grading to fine grained carbonaceous SANDSTONE from 15.45m. Weak to moderately strong 15.50 - 15.90m: grey, fine to medium SANDSTONE. Weak | | UW | SM | HQTT | 100 | | 188 | 16.0 | | | 100 | 16.60m: J, 20° dip, UN, R, VN, FeSt | | | | | | |
| | 15.9m: Grading to unweathered to slightly weathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts of dark grey siltstone. Weak to moderately strong | | UW | SM | HQTT | 100 | | 187 | 16.5 | | | 100 | | | | | | | |
| | 16.55m-16.61m: Slightly weathered, brown, fine to coarse SANDSTONE | | UW | SM | HQTT | 100 | | 186 | 17.0 | | | 100 | | | | | | | |
| | 18.4m: Fine to coarse SANDSTONE, trace fine to medium gravel clasts | | UW | SM | HQTT | 100 | | 185 | 17.5 | | | 100 | 19.15m: BF, 20° dip, UN, SM, VN, light grey silty fine sand | | | | | | |
| | 19.15m: Unweathered grey fine to medium SANDSTONE. Weak to moderately strong 19.25m to 19.35m: Fine to coarse SANDSTONE | | UW | SM | HQTT | 100 | | 185 | 18.0 | | | 91 | 19.86 - 19.98m: J, 20° dip, VCS, UN, SM to PL, R, VN, FeSt and black carbonaceous st | | | | | | |
| | 19.5m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 19.5m to 19.7m: Trace fine to coarse gravel size clasts | | UW | SM | HQTT | 100 | | 185 | 18.5 | | | | | | | | | | |
| | 19.86m-19.98m: Slightly weathered, brown, fine to coarse SANDSTONE | | UW | SM | HQTT | 100 | | 185 | 19.0 | | | | | | | | | | |
| | | | UW | SM | HQTT | 100 | | 185 | 19.5 | | | | | | | | | | |
| | | | UW | SM | HQTT | 100 | | 185 | 19.5 | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 5 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|--|--|-------------|--------|--------------|-------------|-------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 20.0m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong 20.24 - 20.31m: Moderately thin (70mm) bed of grey, SILTSTONE | | | | | | | 184 | | | | | | 20.24m: BF, 15° dip, UN, SM, VN, CN 20.31m: BF, 15° dip, UN, SL to ST, SM, VN, CN 20.45m: BF, 20 PL, R, T, CN, & DD (hammer break) 0, UN, R, T, CN | | | | | | |
| | 20.31m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | HQTT | 100 | | 20.5 | | | | 91 | | | | | | | | |
| | 20.45m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | 21.0 | | | | | | | | | | | | |
| | 21.35m: Unweathered, grey, coarse SANDSTONE. Weak to moderately strong. 21.60 - 21.65m: Fine SANDSTONE | | | | | | | 183 | | | | | | | | | | | | |
| | 21.65m: Unweathered, dark grey, SILTSTONE, minor thin beds of fine SANDSTONE. Weak to moderately strong | | | | | HQTT | 100 | | 21.5 | | | | 90 | 21.65m: BF, 20° dip, UN, SM to ST, SM, VN, CN 21.75m: BF, 20° dip, UN, SL, VN, trace grey silt | | | | | | |
| | 21.75m: Unweathered fine SANDSTONE, grading to fine to coarse SANDSTONE from 22.15m. Weak to moderately strong | | | | | | | 22.0 | | | | | | | | | | | | |
| | 22.32m: Unweathered dark grey SILTSTONE, minor very thin to moderately thin (20mm to 100mm) beds of fine SANDSTONE. Weak to moderately strong | | | | | | | 182 | | | | | | | 22.32m: BF, 35° dip, UN, R, T, VN, CN 22.45m: BF, 20° dip, PL, R, VN, minor black carb st | | | | | |
| | 22.63m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 22.75 - 22.85m: Trace fine to medium gravel size clasts | | | | | | | 22.5 | | | | | | | 22.60m: BF, 15° dip, UN, SL to ST, SM, VN, CN | | | | | |
| | 22.93m: CONGLOMERATE, some thin beds of fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | 23.0 | | | | | | | | | | | | |
| | 23.63m: Unweathered, grey, fine to medium SANDSTONE. Weak 23.80 - 23.89m: Coarse SANDSTONE 23.92 - 23.95m: Coarse SANDSTONE | | | | | | | 181 | | | | | | | 23.32 - 23.58m: J, 70° dip, UN, R, VN, light grey and light green & light brown silica 23.80m: DD, 0° dip, UN, R, T, CN | | | | | Box 7, 18.4-21.0m |
| | 24.3m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | HQTT | 100 | | 23.5 | | | | | | | | | | | |
| | 24.94m: Unweathered, grey, carbonaceous fine SANDSTONE. Weak | | | | | | | 180 | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 6 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|---|--|---------------|-----------------|-------------------|---------|--------|---|-------------------------|---------------------|--|---------|---|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 25.0m: Unweathered, grey, fine SANDSTONE, grading to fine to coarse SANDSTONE from 25.45m. Weak to moderately strong | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | HOTT | 100 | | | 179 | 25.0 | [Yellow dotted pattern] | [Grey vertical bar] | 2000 600 500 400 300 200 100 20 | 100 | 25.38m: BF, 15° dip, UN, SM, VN, trace grey silt, trace FeSt 25.50m: BF, 15° dip, UN, SL to SM, VN, CN | 25 50 75 | | | | |
| | 25.38m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong | | | | | | | 25.5 | 25.50m: BF, 15° dip, UN, SL to SM, VN, CN | | | | | | | | | | |
| | 26.55m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | 26.0 | | | | | | | | | | | |
| | 26.05m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | 26.0 | | | | | | | | | | | |
| | 26.45m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | 26.5 | | | | | | | | | | | |
| | 26.65m: Unweathered, grey, fine to coarse SANDSTONE, some pockets of fine to medium SANDSTONE. Moderately strong | | | | | | | 27.0 | | | | | | | | | | | |
| | 26.85m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong | | | | | | | 27.0 | | | | | | | | | | | |
| | 27.06m: Unweathered, grey, fine SANDSTONE.. Weak to moderately strong | | | | | | | 27.0 | | | | | | | | | | | |
| | 27.2m: Grading to unweathered, grey, fine to coarse SANDSTONE minor fine gravel size clasts. Weak to moderately strong | | | | | | | 27.5 | | | | | | | | | | | |
| | 29.45m: Unweathered, grey, fine to coarse SANDSTONE, trace fine gravel clasts. Weak to moderately strong | | | | | | | 29.5 | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 7 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
(NZTM2000) 1742110.99 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
R.L. COLLAR: 204.30m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|--|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|----------------------------------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 30.0m: Unweathered grey fine to coarse SANDSTONE some fine gravel size clasts. Weak to moderately strong | | UW | MS | HQTT | 100 | | 174 | | | | 100 | | | | | | | | |
| | 30.3m: Unweathered, grey, carbonaceous fine SANDSTONE. Weak to moderately strong | | | | | | | 30.5 | | | | | | 30.30m: BF, 20° dip, UN, R, T-VN, CN | | | | | | |
| | 30.37m: Grading to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | 31.0 | | | | | | 30.90m: BF, 20° dip, UN, R, T-VN, CN | | | | | | |
| | 30.9m: Unweathered, grey, carbonaceous fine SANDSTONE. Weak to moderately strong | | | | | | | 31.1 | | | | | | | | | | | | |
| | 31.1m: Grading to fine to medium SANDSTONE | | | | | | | 31.17 | | | | | | 31.15m: DD, 0° dip | | | | | | |
| | 31.17m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. | | | | | | | 31.26 | | | | | | | | | | | | |
| | 31.26m: Unweathered grey fine to medium SANDSTONE. Weak to moderately strong | | | | | | | 31.35 | | | | | | | | | | | | |
| | 31.35m: Trace fine gravel size clasts | | | | | | | 31.5 | | | | | | | | | | | | |
| | 31.5m: Unweathered, grey, fine to coarse SANDSTONE. Minor fine to medium gravel size clasts. Weak to moderately strong | | | | | | | 32.0 | | | | | | | | | | | | |
| | 32.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | 32.5 | | | | | | | | | | | | |
| 32.88 - 32.89m: Very thin (10mm) bed of dark grey SILTSTONE | | | | | | | 33.0 | | | | | | | 32.88m: BF, 15° dip, UN, R, T-VN, CN | | | | | | |
| 32.89m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | 33.0 | | | | | | 33.00m: DD, 0° dip | | | | | | | |
| 33.0m: Grading to unweathered, grey, fine to coarse SANDSTONE. Trace to minor fine gravel size clasts. Moderately strong | | | | | | | 33.2 | | | | | | 33.20m: DD, 0° dip, Hammer break | | | | | | | |
| 33.8m: Unweathered, grey, fine to coarse SANDSTONE. Moderately strong | | | | | | | 33.5 | | | | | | 33.80m: DD, 0° dip, Hammer break | | | | | | | |
| 34.34 - 34.35m: Carbonaceous | | | | | | | 34.0 | | | | | | | | | | | | | |
| 34.35m: Unweathered, grey, fine to coarse SANDSTONE, minor fine gravel size clasts. Moderately strong | | | | | | | 34.5 | | | | | | | 34.42m: DD, 0° dip, | | | | | | |
| | | | | | | | | | | | | | | 34.50m: DD, 5° dip | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

Box 11, 29.5-32.1m

Box 12, 32.1-35.0m

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 8 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|--|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|--|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 35.0m: Unweathered, interbedded dark grey SILTSTONE and grey fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 169 | 35.0 | | | 100 | 35.00m: BF, 10° dip, UN, SL, T, CN | | | | | | |
| | 36.0m: Unweathered, dark grey, SILTSTONE, interbedded with some thin to moderately thin beds of fine grained SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 168 | 35.5 | | | 100 | 35.20m: DD, 10° dip, PL, R, T, CN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 167 | 36.0 | | | 100 | 35.55m: BF, 10° dip, UN, SM, T, CN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 166 | 36.5 | | | 100 | 35.85m: BF, 0° dip, UN, SM, T, VN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 165 | 37.0 | | | 100 | 35.86m: J, 10° dip, PL, SM, T, CN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 165 | 37.5 | | | 100 | 36.12m: BF, 10° dip, Wavy, UN, SL, T, CN | | | | | | |
| 38.26m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 165 | 38.0 | | | 100 | 36.26m: BF, 10° dip, Wavy, UN, SL, T, CN | | | | | | | |
| 38.68 - 38.78m: Interbedded dark grey SILTSTONE and grey, fine SANDSTONE | | UW | MS | HQTT | 100 | | 165 | 38.5 | | | 100 | 36.60m: DD, 10° dip, UN, SM to R, T, CN, Hammer break | | | | | | | |
| 38.78m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 165 | 39.0 | | | 100 | 36.88m: BF, 10° dip, UN, SM, T, CN | | | | | | | |
| 39.0m: Unweathered, dark grey, SILTSTONE, interbedded with some thin beds of fine grained SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 37.02m: BF, 20° dip, UN, SL, T-VN, CN | | | | | | | |
| 39.3m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 37.20m: J, 40° dip, PL, R, T, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 37.40m: DD, 10° dip | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 37.75m: J, 40° dip, ST, SL, T-VN, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 38.00m: BF, 0° dip, UN, SM, T, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 38.25m: DD, 0° dip, , Hammer break | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 38.50m: J, 25° dip, ST, R, T-VN, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 38.70m: BF, 5 to 10 dip, UN, SL, T, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 39.00m: DD | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 39.25m: DD, 20° dip, UN, SM, T, CN | | | | | | | |
| | | UW | MS | HQTT | 100 | | 165 | 39.5 | | | 100 | 39.60m: J, 60° dip, PL, R, VN, black st, brown fine sand | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 9 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---|----------------|-------------|--------|--------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 39.3m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 164 | 40.5 | | 2000 | 100 | | | | | | | |
| | 41.1m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel, in fine to coarse sand matrix, with rounded coarse gravel size siltstone lense at 41.35m. Moderately strong | | UW | US | HQTT | 100 | | 163 | 41.0 | | 600 | 100 | | | | | | | |
| | 41.4m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | | | | 163 | 41.5 | | 400 | | | 41.40m: J, 50° dip, ST, SM, T-VN, CN | | | | | |
| | 42.6: Unweathered, grey, carbonaceous fine SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 162 | 42.0 | | 200 | | | 42.00m: DD, 0° dip | | | | | |
| | 42.65m: Unweathered, grey, fine SANDSTONE, grading to fine to coarse SANDSTONE from 42.85m. Weak to moderately strong 43.09 - 43.10m: Very thin (10mm) bed of SILTSTONE | | UW | US | HQTT | 100 | | 162 | 42.5 | | 100 | | | 42.60m: DD, 0° dip | | | | | |
| | 43.1m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | | | | 161 | 43.0 | | 20 | | | 43.10m: BF, 15° dip, PL, SM, VN, CN | | | | | |
| | 43.4m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong 43.5m: Unweathered, interbedded, dark grey SILTSTONE and grey fine SANDSTONE. Weak to moderately strong. Thinly bedded. | | UW | US | | | | 161 | 43.5 | | 20 | | | 43.40m: BF, 15° dip, PL, SM, VN, CN faint striations 43.50m: DD, 10° dip | | | | | |
| | 44.1m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 160 | 44.0 | | 20 | | | 44.08m: J, 20° dip, PL, R, T-VN, CN | | | | | |
| | | UW | US | | | | 160 | 44.5 | | 20 | | | 44.55m: J, 5° dip, UN, SM, T-VN, CN 44.56m: J, 75° dip, UN, SM, T-VN, CN | | | | | Box 15, 40.5-45.0m | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH2

SHEET: 10 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 12/04/2018

FINISH DATE: 16/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977395.83 mN
 (NZTM2000) 1742110.99 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 204.30m
 R.L. COLLAR: 204.30m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation |
| UW Pakiri | 45.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 159 | 45.0 | | 2000 | 100 | 44.75 - 45.15m: J, 70 to 80 dip, UN, R, T-VN, CN | | | | | |
| | 45.14m: Interbedded unweathered, grey SILTSTONE and fine SANDSTONE. Weak to moderately strong. Thinly bedded. | | UW | US | HQTT | 100 | | 159 | 45.14 | | 600 | 100 | 45.15m: BF, 20° dip, UN, SM, T-VN, CN | | | | | |
| | 45.24m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 159 | 45.24 | | 400 | 100 | 45.55m: BF, 30° dip, UN, SM, T-VN, CN | | | | | |
| | 45.98m: Unweathered grey SILTSTONE, interbedded with some very thin to thin beds of fine and fine to medium grained SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 158 | 45.98 | | 200 | 100 | 45.60m: DD | | | | | |
| | 47.0m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 157 | 47.0 | | 200 | 100 | 46.50m: J, 5° dip, UN, SM, T-VN, CN | | | | | |
| | 47.7m: Interbedded, unweathered, grey SILTSTONE and fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 156 | 47.7 | | 200 | 100 | 46.86 - 47.04m: J, 65° dip, UN, R, T-VN, CN | | | | | |
| | 47.7m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 155 | 47.7 | | 200 | 100 | 47.55 - 47.70m: J, 65° dip, UN, R, T-VN, CN | | | | | |
| | 49.5m: END OF BOREHOLE | | UW | US | | | | 155 | 49.5 | | | | 48.00m: DD | | | | | Box 16, 45.0-48.0m Box 17, 48.0-49.5m |

COMMENTS: 65mm I.D. piezometer installed on Thurs 19 April 2018.

Hole Depth
49.5m

Scale 1:25

BH3 Log

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 1 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | |
|--|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|--|----------------|-------------|--------|--------------|-------------|--|--|
| | Soil Classification, colour, consistency / density, moisture, plasticity | Rock: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | |
| Fill | 0.0m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | | | |
| | 0.1m: Clayey SILT, trace fine to medium gravel, trace rootlets; Light brown. Very stiff, wet, moderate plasticity | | | | | | | | | | | | | | | | | | | | | |
| CW Pakiri | 0.3m: SILT, minor fine sand, some thin beds of silty fine SAND; light brown and light grey mottled dark orange brown. Very stiff, wet, low plasticity to non plastic | | | | | | | | | | | | | | | | | | | | | |
| | 1.1m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | | | |
| | 1.5m: Push Tube | | | | | | | | | | | | | | | | | | | | | |
| | 2.0m: SILT, some fine sand, trace clay; light greyish brown mottled orange brown. Very stiff, wet, high plasticity | | | | | | | | | | | | | | | | | | | | | |
| | 2.45m: SILT, some fine sand, trace clay, trace very thin beds of light grey sandy SILT; light brown mottled orange brown. Very stiff, wet, high plasticity | | | | | | | | | | | | | | | | | | | | | |
| | 3.0m: Push Tube | | | | | | | | | | | | | | | | | | | | | |
| 3.5m: SILT, minor fine sand, trace clay, trace very thin beds of sandy SILT; light brown mottled orange brown. Very stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | | | | | |
| 4.65m-4.70m: Dark reddish brown limonite staining 4.7m: Orange brown minor light grey mottles | | | | | | | | | | | | | | | | | | | | | | |
| 4.77m: SILT, some fine sand, some very thin to thin beds of silty fine SAND; light brown mottled orange brown. Very stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-4.0m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 2 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|--|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| HW Pakiri | 5.0m: Highly weathered, light brown SILTSTONE, some thin to moderately thin beds of fine SANDSTONE. Extremely weak, easily scratched by fingernail [SILT, some thin to moderately thin beds of silty fine SAND; light brown. Very stiff to hard, low plasticity] | | | | HQTT | 100 | | 240 | 5.5 | | | 0 | 5.00 - 6.00m: J, Very closely spaced, orthogonal, 10 to 70 dip, UN, SM to R, VN, FeSt | | | | | | |
| | 6.3m: No recovery (core loss) | | | | SPT | 100 | 3/8 10/13 13/13 N=49 Solid | | 6.0 | | | | | | | | | | |
| SW Pakiri | 6.45m: Highly weathered, light brown SILTSTONE, some thin to moderately thin beds of fine SANDSTONE. Extremely weak, easily scratched by fingernail [SILT, some thin to moderately thin beds of silty fine SAND; light brown. Very stiff to hard, low plasticity] | | | | HQTT | 100 | | 239 | 6.5 | | | 19 | 6.45 - 6.60m: J, VCS, 70 to 90, UN, SM, VN, FeSt, some VCS, T to VN, UN, SM, CN to FeSt | | | | | | |
| | 7.55m: Slightly weathered interbedded SILTSTONE and fine grained SANDSTONE. Very weak to weak | | | | | | | 238 | 7.5 | | | | | | | | | | |
| | 8.1m: No recovery (core loss) | | | | | | | | 8.0 | | | | | | | | | | |
| | 8.2m: Slightly weathered, grey, fine SANDSTONE, minor thin to moderately thin beds of grey SILTSTONE. Very weak to weak | | | | | HQTT | 93 | | 237 | 8.5 | | | 36 | | | | | | |
| | 8.62 - 8.70m: Carbonaceous | | | | | | | | 9.0 | | | | | | | | | | |
| | 8.85 - 9.00m: Carbonaceous | | | | | | | | 9.5 | | | | | | | | | | |
| | 9.25m: Slightly weathered, grey, SILTSTONE, some very thin beds of fine SANDSTONE. Very weak to weak | | | | | | | 236 | 9.5 | | | 90 | 9.70m: B, 20° dip, PL, R, T-VN, trace brown silt 9.82m: J, -15° dip, UN, SM, T-VN, trace brown silt 9.83m: J, -5° dip, ST, SM, T-VN, trace brown silt 9.95m: J, 2, UN, R, VN, brown silt | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 3 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | |
|-----------------|--|---|--|---------------------------|-----------------|-------------------|---------|--------|-----------|---------------------------------------|---------------------------------------|---------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|------|------|------|------|------|----|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Fracture Spacing (mm) | RQD (%) | Defect Log | | | | | | | | | | | | |
| SW Pakiri | 10.0m: Slightly weathered, grey, fine SANDSTONE, minor thin to moderately thin beds of grey SILTSTONE. Very weak to weak | | UW MW SW CS US MS SS EW | S VS MS VS EW | HQTT | 100 | | 235 | 10.5 | | 2000 600 200 100 50 20 | 90 | 10.05m: J, 10° dip, UN, SM, T-VN, trace brown silt 10.17m: J, 10° dip, UN, R, T-VN, trace brown silt 10.22m: J, -15° dip, UN, SM, T-VN, trace brown silt 10.35m: J, 70° dip, UN, SM-R, T-VN, trace brown silt 10.38m: J, 5° dip, UN, SM, T-VN, trace brown silt 10.70m: J, 5° dip, UN, SM, T-VN, brown silt, DD 10.78m: J, 0 to 5, UN, SL, T-VN, FeSt 10.85m: J, 80° dip, UN, SM, T-VN, FeSt 10.88 - 10.90m: J, 5° dip, UN, R, T-VN, CN 11.02m: B, 5 to 10, UN, SM, T-VN, trace brown silt 11.22m: B, 5° dip, UN, R, T-VN, trace brown silt 11.30m: B, 10° dip, UN, S, T-VN, trace brown silt 11.38m: B, 5° dip, UN, SM, VN, FeSt 11.60 - 11.67m: J, 5° dip, UN, SM - SL, VN, brown silt 11.65m: J, 40° dip, UN, SL, VN, brown silt 11.76m: J, 40° dip, UN, SL, VN, brown silt 12.05m: B, 0° dip, UN, SL, T-VN [DD] 12.07m: J, 45° dip, UN, SM, T-VN, CN 12.15m: B, 5, UN, SM to ST, SM, T-VN, CN 12.25m: J, 5, ST, SM, T - VN, CN 12.30 - 12.35m: BZ 12.43 - 12.85m: B, VCS, 5, UN, SL to R, VN, brown silt 12.50m: J, 20° dip, UN, R, VN, FeSt 12.95m: J, 40° dip, UN, SM, VN, brown silt 13.10 - 13.25m: B, 5 to 20, UN, SL to SM, T to VN, CN 13.35 - 13.40m: BZ 13.44m: B, 10, UN, SL, T-VN, CN 13.50 - 13.65m: J, VCS, 5, PL, R, VN, CN 13.65 - 13.80m: J, 5 to 80, UN, SM VN, trace brown silt 13.80 - 13.85m: BZ 13.94m: B, 10, UN, SL, VN, brown silt 13.98m: J, 70° dip, UN, SM, T, CN 14.10 - 14.20m: J, 60° dip, 60, UN, SL, VN, brown silt, & orthog 60, UN, R, T - VN, CN 14.28m: J, 30° dip, PL, R, VN, brownish grey CC 14.40m: J, 60° dip, UN, R, T-VN, CN 14.55 - 14.70m: J, VCS to ExCS, 20 to 60, UN, SM to R, T to VN, CN to grey clayey silt 14.87m: B, 30° dip, UN, SL, T, CN 14.90m: J, 10, UN, SL, T, CN | 25 50 75 | | | | | | | | | | | |
| | 10.5m: Slightly weathered, grey, SILTSTONE, minor thin to moderately thin beds of grey fine SANDSTONE. Very weak to weak | | | | | | | | | | | | | | | | | | | | HQTT | 100 | 234 | 11.0 | 73 |
| | 11.7m: Slightly weathered, grey, fine SANDSTONE, minor moderately thin beds of grey SILTSTONE. Very weak to weak | | | | | | | | | | | | | | | | | | | | HQTT | 100 | 12.0 | 23 | |
| | 12.31m: Slightly weathered, grey, fine SANDSTONE, some thin beds of grey SILTSTONE. Weak | | | | | | | | | | | | | | | | | | | | HQTT | 100 | 12.5 | 231 | |
| UW-SW Pakiri | 13.94m: Unweathered to slightly weathered, grey fine SANDSTONE. Weak 13.98 - 14.02m: Carbonaceous | | UW MW SW CS US MS SS EW | S VS MS VS EW | HQTT | 100 | | 14.0 | | 2000 600 200 100 50 20 | 43 | | | | | | | | | | | | | | |
| | 14.15m: Unweathered to slightly weathered, grey fine to medium SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | HQTT | 100 | 14.5 | | | |
| | 14.88m: Lense of grey SILTSTONE | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 4 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | |
| UW-SW Pakiri | 14.15m [Cont'd]: Unweathered to slightly weathered, grey fine to medium SANDSTONE. Weak 15.05 - 15.12m: Lenses of grey SILTSTONE | | UW | MS | HQTT | 100 | | 230 | 15.5 | | 2000 600 200 100 50 20 | 70 | 15.10m: DD 15.25m: B, 15° dip, ST, SM, T-VN, CN 15.34m: J, 10° dip, UN, SM, VN, trace brown sandy SILT 15.45m: J, 30° dip, UN, SL, T-VN, CN 15.46m: B, 20° dip, PL, SM to UN, SM, VN, greyish brown sandy SILT 15.64m: J, 15° dip, UN, SM, T, CN 15.70m: J, 65° dip, UN, SL, T-VN, CN 15.72m: J, 15° dip, UN, SM to ST, SM, VN, grey CC 15.73 - 15.78m: J, VCS, orthog, 60 to 80, UN, SL to ST, SM, T-VN, CN 15.86m: B, 15° dip, ST, SM, VN, brown clay veneer 15.87m: J, 75° dip, UN, SL, T-VN, CN 15.94m: J, 60° dip, PL, SM to UN, SL, VN, trace grey silt 16.10m: B, 15, UN, R, VN, CN 16.35m: B, 15° dip, UN, R, T-VN, CN 16.36m: J, 40° dip, UN, SM T-VN, CN 16.38m: B, 15° dip, ST, SM, T-VN, CN 16.47m: J, 15, ST, SM, VN, CN 16.47 - 16.50m: BZ, Rec m-c gvl 16.75m: J, 15° dip, UN, R, VN, trace brown silty CLAY 16.92m: J, 40° dip, UN, R, T-VN, CN 16.95m: J, 20° dip, ST, SM, T-VN, CN 17.00m: J, 10, UN, SM, T-VN, CN 17.10m: J, 40° dip, UN, R, T, CN 17.11 - 17.18m: J, 15° dip, ST, SM, to UN, R, VN to N, grey silt 17.23m: J, 20° dip, UN, SM to ST, SL, N, grey silty clay 17.25m: J, 70° dip, UN, R, T-VN, FeSt 17.27 - 17.35m: J, Orthog, 5 to 40 dip, UN, SM to R, VN to N, brown sandy silt, FeSt 17.55m: J, 40° dip, UN, SM, N to MN, gravelly fine sand, FeSt 17.56m: J, 40° dip, PL, R, T-VN, minor FeSt 17.80m: J, 15, ST, SM, VN, CC 17.88m: J, 50° dip, UN, SM, T-VN, CN 17.90m: J, 10° dip, ST, SM, T-VN, CC 18.00 - 18.01m: J, 15° dip, UN, SM to PL, R, T-VN, CC 18.13m: B, 15° dip, ST, SM, T, CN | | | | | | | | | | | | | | | | | | | |
| | 15.25m: Unweathered to slightly weathered, dark grey, SILSTONE, minor thin to moderately thin (30mm to 120mm) beds of grey fine SANDSTONE. Weak 15.51 - 15.58m: Carbonaceous, trace fine gravel clasts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15.94m: Unweathered to slightly weathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 17.27 - 17.35m: Slightly weathered, brown. Very weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18.0m-18.13m: Carbonaceous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 18.5m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.0m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.33m: Conglomerate is fine gravel in fine to coarse sand matrix. Matrix supported | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.68m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong. 19.86 - 19.90m: Slightly carbonaceous 19.92m: Grey, fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 5 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|---|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 19.92m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | | | | | | | | | | | | | | | | | |
| | 21.15m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong 21.34 - 21.37m: Carbonaceous | | UW | | | | | | | | | | | | | | | | | |
| | 21.4m: Unweathered, dark grey, SILTSTONE, some thin beds of carbonaceous, fine SANDSTONE. Weak to moderately strong | | UW | | | | | | | | | | | | | | | | | |
| | 21.65m: Unweathered, grey, fine SANDSTONE, grading to fine to coarse SANDSTONE from 21.75m. Minor thin to moderately thin (50mm to 80mm) beds of dark grey SILTSTONE. Weak to moderately strong 21.65 - 21.69m: Carbonaceous | | UW | | | | | | | | | | | | | | | | | |
| | 22.83m: Unweathered, grey, fine SANDSTONE, becoming fine to medium SANDSTONE from 24.0m. Weak to moderately strong 23.95 - 24.00m: Carbonaceous | | UW | | | | | | | | | | | | | | | | | |
| | 24.1m: Unweathered, grey, CONGLOMERATE. Conglomerate is minor fine gravel in fine to coarse SAND matrix. Matrix supported. Weak to moderately strong | | UW | | | | | | | | | | | | | | | | | |
| 24.8m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 6 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | |
|--|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-------------------------|-------------------------|------------------------|----------------------------------|---------|----------------|-------------|--------|---|-------------------|---|----|---|----|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | Description & Additional Observations | | | |
| UW Pakiri | 24.8m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE, grading to fine to coarse SANDSTONE from 25.2m. Weak to moderately strong | | UW | S | HQTT | 100 | | 220 | 25.5 | [Yellow dotted pattern] | 2000 | 25.15m: DD, 5° dip, UN, R, T, CN | 25 | | | | | Box 9, 23.6-26.4m | | | | |
| | 25.20 - 25.45m: Trace fine gravel size clasts | | | | | | | | | | 500 | | | | | | | | 25.50m: DD | 50 | | |
| | 25.60 - 25.70m: Trace fine gravel size clasts | | | | | | | | | | 200 | | | | | | | | | | 25.75m: DD, 0° dip, Hammer break | 20 |
| | 25.80 - 26.05m: Trace fine to medium gravel size clasts of dark blackish grey and green SILTSTONE | | | | | | | | | | 100 | | | | | | | | | | | |
| 26.9m: Unweathered, grey, fine to coarse SANDSTONE, trace fine to medium gravel size clasts. Weak to moderately strong | | UW | S | HQTT | 100 | | 219 | 26.0 | [Yellow dotted pattern] | 2000 | 26.35m: DD, 0° dip | 25 | | | | | | | | | | |
| 26.50m: DD, 0° dip, Hammer break | | | | | | | | | | 500 | | | | | | | 26.90m: DD, 20° dip, Hammer break, UN, R, T, CN | 50 | | | | |
| 27.40m: DD, 0° dip, Hammer break | | | | | | | | | | 200 | | | | | | | | | 27.45m: J, 60° dip, UN, R, VN, black staining | 20 | | |
| 28.05m: DD, 0° dip, Hammer break | | | | | | | | | | 100 | | | | | | | | | | | 28.70 - 28.95m: J, 75° dip, UN, R, VN, black staining | 96 |
| 28.00 - 28.50m: Trace fine gravel size clasts | | UW | S | HQTT | 100 | | 218 | 27.0 | [Yellow dotted pattern] | 2000 | 28.75m: black staining | 25 | | | | | | | | | | |
| 28.85m: Lense (medium gravel size) of green SILTSTONE. Very weak, easily scratched by fingernail | | | | | | | | | | 500 | | | | | | | 28.80m: J, 50° dip, UN, R, VN, black staining | 20 | | | | |
| 29.00 - 29.40m: Trace fine gravel size clasts | | | | | | | | | | 200 | | | | | | | | | 29.55m: DD, 5° dip | 93 | | |
| | | | | | | | | | | 100 | | | | | | | | | | | | |
| | | UW | S | HQTT | 100 | | 217 | 27.5 | [Yellow dotted pattern] | 2000 | Lugeon Test @ 27.0m | 25 | | | | | | | | | | |
| | | | | | | | | | | 500 | | | | | | | | | | | | |
| | | | | | | | | | | 200 | | | | | | | | | | | | |
| | | | | | | | | | | 100 | | | | | | | | | | | | |
| | | UW | S | HQTT | 100 | | 216 | 28.5 | [Yellow dotted pattern] | 2000 | | 25 | | | | | | | | | | |
| | | | | | | | | | | 500 | | | | | | | | | | | | |
| | | | | | | | | | | 200 | | | | | | | | | | | | |
| | | | | | | | | | | 100 | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 7 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|---|--|----|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 30.0m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 30.25m to 30.7m: Carbonaceous laminae | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 30.8m: Grading to fine to medium SANDSTONE | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 31.05m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 31.35m to 31.5m: Trace fine gravel size clasts | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 31.55m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in a matrix of fine to coarse sand. Matrix supported. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 32.5m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 32.88m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 33.4m: Grading to fine to coarse SANDSTONE | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| | 33.80 - 34.15m: Calcite vein, VN, 70 deg dip. | | UW | US | HQTT | 100 | | | | | | | | | | | | | | |
| 34.0m: Grading to fine to coarse SANDSTONE, trace fine gravel size clasts | | UW | US | HQTT | 100 | | | | | | | | | | | | | | | |
| 34.6m to 34.8m: Fine to medium SANDSTONE | | UW | US | HQTT | 100 | | | | | | | | | | | | | | | |
| 34.92m: Grey SILTSTONE | | UW | US | HQTT | 93 | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 8 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

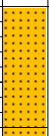
CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|---|--|---------------|-----------------|-------------------|---------|--------|-----------|---|--|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 35.0m: Unweathered, grey, SILTSTONE. Weak to moderately strong | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | HOTT | 100 | | | 210 | 35.5 |  | 2000 600 400 200 100 50 20 | 93 | CN | | 25 50 75 | | | | |
| | 35.4m: Grading to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 35.9m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 36.8m: Grading to fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | |
| | 37.25m - 37.27m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in a matrix of fine to coarse sand. Matrix supported | | | | | | | | | | | | | | | | | | |
| | 37.27m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 38.75m: Grading to fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | |
| | 39.25m: Unweathered, grey CONGLOMERATE. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported | | | | | | | | | | | | | | | | | | |
| | 39.32m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 39.7m to 39.9m: Fine to medium SANDSTONE | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 13, 34.3-36.9m

Box 14, 36.9-39.9m

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 9 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
 (NZTM2000) 1742966.42 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
 R.L. COLLAR: 245.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|--|---|---|--|--|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 39.32m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW MW SW CW US MS SS MW SW CW EW | US MS SS MW SW CW EW | HQTT | 100 | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| | 40.25m to 40.3m: Trace fine gravel size clasts | | | | | | | | | | | | | | | | | | |
| | 40.4m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 41.2m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 41.58m: Unweathered, grey, fine SANDSTONE, thin (50mm) bed of grey SILTSTONE at 41.71m. Weak to moderately strong 41.58 - 41.66m: Carbonaceous | | | | | | | | | | | | | | | | | | |
| | 41.90 - 42.00m: Carbonaceous | | | | | | | | | | | | | | | | | | |
| | 42.0m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | |
| | 42.38 - 42.50m: Minor very thin to moderately thin (20mm to 80mm) beds of dark grey SILTSTONE 42.50 - 42.55m: Carbonaceous | | | | | | | | | | | | | | | | | | |
| 42.8m: Unweathered, grey, SILTSTONE, some thin to moderately thin beds of carbonaceous fine to medium grained SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| 43.5m: Interbedded, unweathered, grey SILTSTONE & fine SANDSTONE. Weak. | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH3

SHEET: 10 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977815.49 mN
(NZTM2000) 1742966.42 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 245.50m
R.L. COLLAR: 245.50m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|---------------------|---|---|-----------------|---------------|-----------------|-------------------|---------------------|---------------|-----------|---------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|----|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| UW Pakiri | 45.0m: Unweathered, grey SILTSTONE, some thin to moderately thin beds of fine SANDSTONE. Weak | | UW | MS | HQTT | 100 | Lugeon Test @ 45.0m | 199 | 45.0 | [Graphic Log] | 2000 | 600 | 200 | 45.00m: DD | 25 | | | | | |
| | 47.6m: Interbedded, unweathered, grey SILTSTONE & fine SANDSTONE. Weak. Beds are very thin to moderately thin | | | | | | | | | | | | | | | | | | | UW |
| 49.5m: Target depth | | UW | MS | HQTT | 100 | 196 | 49.5 | [Graphic Log] | 2000 | 600 | 200 | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on 3 May 2018. Shear vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

General Log - 5/04/2019 11:16:32 a.m. - Produced with Core-GS by GeRoc

Box 17, 45.0-47.6m

Box 18, 47.6-49.5m

Rev.: A

BH4 Log

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 1 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|---|---|---|-----------------|---------------|-----------------|-------------------|----------|---------------------------------------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Pakiri Formation | 0.0m: Fine SAND, minor silt, some rootlets; reddish brown. Very loose, moist | | | | | | | | | | | | | | | | | | | |
| | 0.7m: No recovery (core loss) | | | | HQTT | 46 | | | 193 | | | | | | | | | | | |
| | 1.5m: Fine SAND, with minor silt, with trace rootlets; reddish brown with black streaks. Very loose; moist | | | | PT | 74 | | 77/13 kPa | 192 | | | | | | | | | | | |
| | 2.3m: SILT, some fine sand, trace rootlets; light greyish brown with some black streaks. Firm, moist, low plasticity | | | | SPT | 100 | | 1/1 1/1 0/1 N=3 | | | | | | | | | | | | |
| | 2.65m: Silty fine SAND; light greyish brown and reddish brown, minor black streaks. Loose to medium dense, moist to wet. | | | | HQTT | 100 | | | 191 | | | | | | | | | | | |
| | 3.6m: Fine to medium SAND, with minor silt; light greyish brown and orange brown, minor black streaks. Loose to medium dense, wet | | | | SPT | 100 | | 16/0 kPa 1/2 2/2 3/4 N=11 | | | | | | | | | | | | |
| | 4.00 - 4.10m: grades to some fine gravel | | | | HQTT | 42 | | | 190 | | | | | | | | | | | |
| | 4.1m: SILT, some fine sand, trace clay; light grey. Soft to firm, moist, non-plastic to low plasticity | | | | | | | | | | | | | | | | | | | |
| 4.30m: Sand is absent, becomes firm to stiff. | | | | | | | | | | | | | | | | | | | | |
| 4.40m: Some yellowish brown staining, becomes low-plasticity. | | | | PT | 100 | | 21/0 kPa | 189 | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-4.5m

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 2 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | ROCK DEFECTS | | | | | | | | | | | | | |
|---|---|--|--|--------------------------------------|--------------|------------------------------------|-----------|--|------------|-----------------------|---------|--|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering <small>UW MW SW CW US SLS USL USV USW</small> | Rock Strength <small>US SLS USL USV USW</small> | Sampling Method Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| Pakiri Formation | 5.0m: SILT, trace clay; light grey, with orange mottling. Firm to stiff, moist, low plasticity 5.70 - 5.75m: sandy SILT; orange brown. | | | SPT | 66 | 1/1 1/1 4/5 N=11 | | 5.5 | | | | | | | | | | |
| | 5.2m: Fine SAND, trace silt; greyish brown, some black streaks. Medium dense, moist 5.3-5.45m: No recovery (core loss) | | | | | | | | | | | | | | | | | |
| | 5.6m: Completely weathered, brown, fine to medium SANDSTONE. Extremely weak. [Fine to medium SAND, trace fine to medium gravel; brown some reddish brown bands] | | | HQTT | 72 | | | 5.60 - 5.70m: BZ, 40° dip, UN, R, VN, VCS, FeSt, some fine gravel | | | | | | | | | | |
| | 6.0m: SILT, minor clay; light grey. Stiff, moist, low plasticity. | | | | | 2/3 4/5 6/5 N=20 | | 6.0 | | | | 5.90 - 6.00m: BZ, 40° dip, UN, R, VCS, black staining | | | | | | |
| | 6.15m: Fine to medium SAND; greyish brown, with orange brown and black bands. Medium dense, moist. | | | SPT | 100 | | | 6.10m: J, Narrow (3mm) FeSt joint | | | | | | | | | | |
| | 6.45m: Highly weathered, brown, fine to medium SANDSTONE. Very weak. | | | | | | | 6.55m: J, 0-40° dip, UN, R, VN, black st 6.68m: J, 0° dip, UN, R, VN, black st 6.70m: J, 45° dip, UN, R, VN, black st 6.83m: J, 30-45° dip, intersecting joints, UN, R, VN, black st 6.93m: J, 45° dip, UN, R, VN, black st 7.02m: J, 5° dip, curved??, UN, R, VN, black st 7.07m: J, 15° dip, UN, R, VN, black st 7.20m: J, 30° dip, SC, R, VN, black st, some FeSt 7.30m: J, 30° dip, UN, R, VN, black staining; intersecting J 45° UN, R, VN, black st 7.35m: J, 30° dip, UN, R, VN, black st 7.40 - 7.50m: DD, Rec f-c gvl | | | | | | | | | | |
| | 7.5m: No recovery (core loss) | | | SPT | 0 | 2/4 5/6 6/5 N=22 Solid | | 7.5 | | | | | | | | | | |
| | 7.95m: Highly weathered, brown, fine to coarse SANDSTONE. Very weak. | | | HQTT | 57 | | | 7.95 - 8.40m: BZ, Intersecting joints, 0-90° dip, UN, R, VCS-CS, black staining. Joints have been ground during drilling | | | | | | | | | | |
| | 8.55m: No Recovery (core loss) | | | | | | | 8.5 | | | | | | | | | | |
| | 9.0m: Highly weathered, brown, fine to coarse SANDSTONE. Extremely weak to very weak. | | | SPT | 0 | 2/5 6/9 13/15 N=43 | | 9.0 | | | | | | | | | | |
| 9.85 - 9.95m: some grey silt through broken zone. | | | | | | | 9.5 | | | | | 9.45 - 9.80m: B, 0-75° dip, bedding planes 10-15mm apart, UN, R, VN, ECS, FeSt 9.85 - 9.95m: BZ, fine to coarse angular gravel, Fe staining | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 2, 4.5-9.5m

11/05/2018

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 3 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|------------------|--|--|-----------------|---------------|-----------------|-------------------|---|--------|-----------|-------------|------------|-----------------------|---|--|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| Pakiri Formation | 10.0m: Highly weathered, brown, fine to coarse SANDSTONE. Extremely weak to very weak. | | UW | US | HQTT | 90 | | | | | | | 9.95 - 10.50m: B, 10-90° dip, UN, R, bedding ExCS, 10-15 mm apart, FeSt | | | | | | |
| | 10.50 - 10.55m: some grey, sandy silt. Non-plastic. | | | | SPT | 100 | 5/10 15/15 20 for 75mm N>=50 | 183 | 10.5 | | | | | | | | | | |
| | 10.95m: Moderately weathered, light brown stained reddish brown, fine SANDSTONE. Very weak. | | | | HQTT | 100 | | | 11.0 | | | | 10.95 - 11.45m: J, 0-90° dip, highly jointed, FeSt gravel infill VN-N, VCS-CS | | | | | | |
| | 11.50m: Unweathered, grey, fine to medium SANDSTONE. Some carbonaceous banding. Weak to moderately strong 11.75m: 20mm banded grey siltstone. | | | | HQTT | 100 | | | 182 | 11.5 | | | | 11.50m: B, 10° dip, UN, R, VN, grey silt | | | | | |
| | 12.11 - 12.30m: Thin to moderately thin (40mm to 80mm) beds of dark grey SILTSTONE and fine SANDSTONE. | | | | | | | | 12.0 | | | | | 11.85 - 12.00m: DD, rock highly fractured due to drilling 12.11m: B, 15° dip, ST, R, VN, CL 12.28m: J, 15° dip, UN, R, VN, CL | | | | | |
| | 12.30m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. 12.50m: grades to fine to coarse SANDSTONE, trace fine gravel. | | | | HQTT | 100 | | | 181 | 12.5 | | | 88 | 12.90m: J, 75° dip, UN, R, VN, CL 13.12m: B, 30° dip, UN, SM, VN, grey silt 13.25m: B, 10° dip, UN, R, VN | | | | | |
| | 13.12m: Unweathered, grey, SILTSTONE. Weak, carbonaceous banding. 13.25m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong. Carbonaceous banding. | | | | | | | | 13.0 | | | | | | | | | | |
| | 13.30m: becomes fine to medium grained, carbonaceous banding absent. 13.60m: becomes fine to coarse grained, trace fine gravel. | | | | | | | | 13.5 | | | | | 13.55m: DD, 5° dip, UN, R, VN 13.70m: DD, 0° dip, UN, SM, VN, CL 13.83m: DD, 30° dip, UN, R, VN, CL | | | | | |
| | 14.20 - 14.60m: some fine gravel. 14.60m: grades to fine to medium. 14.75m: grades to fine to coarse grained. | | | | HQTT | 100 | | | 180 | 14.0 | | | 93 | 14.01m: DD, 20° dip, UN, R, VN, CL 14.04m: DD, 5° dip, UN, R, VN, CL 14.20m: Calcite vein 1mm thick, 85° 14.50m: J, 75° dip, UN, R, N-VN, some FeSt, quartzite deposits 14.60 - 15.00m: Calcite vein 2 mm thick, 85° | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 3, 9.5-12.5m

Box 4, 12.5-15.0m

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 4 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
(NZTM2000) 1742575.86 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
R.L. COLLAR: 193.70m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|---|--|--------------------|-----------------------|-----------------|-------------------|-----------------|---|---------------|--------------|--------------------|--|--|---------------------------------------|---------------|----------------|----------------|---------------|--------------|-------------|
| | Soil: Classification, colour, consistency / density, moisture, plasticity Rock: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | |
| Pakiri Formation | 15.0m: Slightly weathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | [Weathering scale] | [Rock strength scale] | HQTT | 100 | [Testing scale] | 178 | [Graphic log] | [Defect log] | [Fracture spacing] | 96 | 15.00m: DD, ended run break, 40° UN, R, VN, along calcareous bedding, black staining | [Fluid loss scale] | [Water level] | [Casing] | [Installation] | [Core box no] | | |
| | 15.30 - 15.40m: trace fine gravel. | | | | | | 15.5 | | | | 15.25 - 15.65m: BZ, 80° dip, UN, R, MN (10-15mm), infill is fine to coarse gravel, some black silt | | | | | | | | |
| | 15.65 - 15.70m: Slightly weathered, grey, SILTSTONE. Weak to moderately strong | | | | | | 16.0 | | | | 15.35m: DD, 0° dip, UN, R, VN, CL | | | | | | | | |
| | 15.7m: Slightly weathered, grey, fine to medium, SANDSTONE. Weak to moderately strong. | | | | | | 16.13m: DD, hammer break | | | | | | | | | | | | |
| | 16.00m: becomes fine to coarse grained, trace fine to medium gravel. | | | | | | 16.27m: DD, hammer break | | | | | | | | | | | | |
| | 16.3m: Slightly weathered, grey, CONGLOMERATE. Weak to moderately strong. | | | | | | 16.40m: DD, 0° dip, UN, R, VN, CL | | | | | | | | | | | | |
| | 16.4m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | 16.65 - 16.80m: J, 0° dip, UN, R, VN, CL, possible drilling break | | | | | | | | | | | | |
| | 16.72 - 16.78m: layer of coarse grained sandstone. | | | | | | 16.78m: J, 70-90° dip, UN, R, VN, CL, broken along calcite vein | | | | | | | | | | | | |
| | 16.95m: becomes fine to medium grained. | | | | | | 16.95m: DD, hammer break | | | | | | | | | | | | |
| | 17.15m: fine to coarse grained. | | | | | | 17.20m: J, intersecting joints, 85° dip, 75° dip, UN, R, VN, black staining, trace black silt | | | | | | | | | | | | |
| | 17.50m: DD, 0° dip, fracture | | | | | | | | | | | | | | | | | | |
| | 17.70 - 18.00m: BZ, or DD, end of drill run broken | | | | | | | | | | | | | | | | | | |
| | 18.00m: J, 60° dip, UN, R, VN, black staining | | | | | | | | | | | | | | | | | | |
| | 18.20m: J, intersecting joints, 50° dip, UN, R, VN, black staining; J 90° dip, 70° dip, UN, R, VN, black staining | | | | | | | | | | | | | | | | | | |
| 18.55m: Unweathered, grey, SILTSTONE. Weak to moderately strong. | 18.55m: B, 10° dip, ST, SM, VN, CL | | | | | | | | | | | | | | | | | | |
| 18.75m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. Carbonaceous from 18.75m to 18.85m. | | | | | | | | | | | | | | | | | | | |
| 19.20m: becomes fine to coarse grained. | 19.05 - 19.35m: J, 90° dip to 70° dip, UN, R, VN, black and greenish staining, DD around joint | | | | | | | | | | | | | | | | | | |
| 19.30m: trace fine gravel. | | | | | | | | | | | | | | | | | | | |
| 19.50m: gravel absent. | 19.90m: Calcite vein 60° | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 5 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|--|--|--|----------------------------------|---|---|--------------------------|--------------------------|---------------------------------------|---------|---|----------------|-------------|--------|--------------|-------------|--|---|---|---|--|--|--|---|--|---|---|---|---|---|---|--|------------------------------|----------------------------------|---|--------------------------|--------------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | |
| Pakiri Formation | 20.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | UW MW CW US MS CS US MS CS US MS CS US MS CS | 100 | HQTT | 100 | | 173 | 20.5 | [Yellow dotted pattern] | [Vertical line] | 2000 600 200 100 50 20 | 100 | 20.00m: Calcite vein 60° | 25 50 75 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 21.50m: trace fine gravel. | | | | | | | | | | | | | 20.10m: DD, hammer break | | | | | | | 20.10m: Calcite vein 70° | 20.50m: Calcite vein 80° | 20.70m: DD, hammer break | 21.00m: DD, broken with hammer | 21.20m: DD, hammer break | 21.80m: DD, hammer break | 22.00m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break |
| | 22.0m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | | | | | | | | | | | | | 22.00m: DD, broken with hammer | | | | | | | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | |
| | 22.65m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong, trace fine gravel. | | | | | | | | | | | | | 21.00m: DD, broken with hammer | | | | | | | 21.20m: DD, hammer break | 21.80m: DD, hammer break | 22.00m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | |
| | 22.9m: Unweathered, grey, carbonaceous SILTSTONE. Weak to moderately strong. | | | | | | | | | | | | | 21.20m: DD, hammer break | | | | | | | 21.80m: DD, hammer break | 22.00m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | |
| | 23.05m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | | 21.80m: DD, hammer break | | | | | | | 22.00m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | |
| | 23.25m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | | 22.00m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. 22.30m: gravel becomes fine to coarse, gravel is green and black siltstone. | | | | | | | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | |
| | 23.5m: Unweathered, interbedded, grey, fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. Beds are very thin to moderately thin (20mm to 100mm) | | | | | | | | | | | | | 22.30m: J, 90° dip, 150mm long, UN, R, VN, CL, fracturing along gravel surfaces. Broken after drilling through core. | | | | | | | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | | |
| | 23.72m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. 23.85m: trace fine gravel. | | | | | | | | | | | | | 22.70m: J, 70° dip to -70° dip, UN, R, VN, CL | | | | | | | 22.85m: J, 80° dip, calcite vein | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | | | |
| | 24.06m: Unweathered interbedded, grey, fine SANDSTONE and SILTSTONE. Weak to moderately strong. Thinly laminated. 24.30 - 24.35m: Thin bed of SILTSTONE | | | | | | | | | | | | | 22.85m: J, 80° dip, calcite vein | | | | | | | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | | | | |
| 24.35m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | 22.90m: DD, hammer break | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24.5m: Unweathered, grey interbedded fine SANDSTONE and dark grey SILTSTONE. Thinly laminated up to 50mm. | | 23.05m: B, 0-46° dip, UN, R, VN, CL | 23.10 - 23.50m: J, not fully broken, 70-90° dip, not open UN | 23.50m: DD, hammer break | 23.70m: DD, hammer break through siltstone | 24.00m: DD, end of run break | 24.25m: B, 5° dip, PL, R, VN, CL | 24.30m: B, 0° dip, PL, SM, VN, grey silt (ground during drilling) | 24.60m: DD, hammer break | 24.97m: DD, hammer break | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 7, 20.1-22.9m

General Log - 5/04/2019 11:16:35 a.m. - Produced with Core-GS by GeRoc

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 6 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

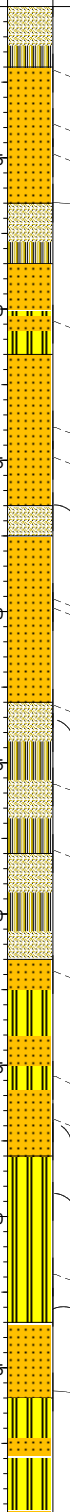
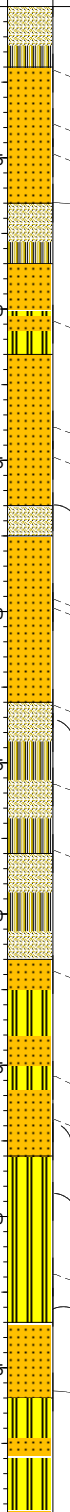
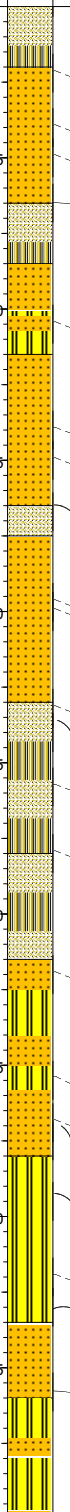
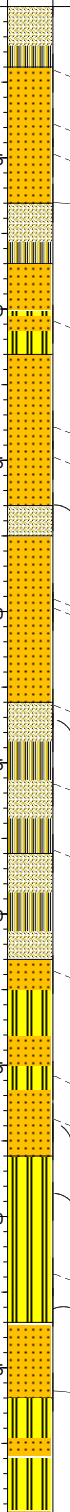
CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | |
|------------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|--|---------------------------------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|-------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | |
| Pakiri Formation | 25.0m: Unweathered, grey interbedded SILTSTONE and fine SANDSTONE. Thinly laminated up to 50mm. | | UW | MS | HQTT | 100 | | 168 | 25.0 |  | 2000 600 200 100 50 20 | 94 | 25.22m: DD, hammer break | | | | 25 | | | | Box 8, 22.9-25.6m |
| | 25.2m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | 25.40m: DD, J 0° dip, UN, R, VN, CL | | | | | | | | |
| | 25.65m: Unweathered, interbedded SILTSTONE and fine SANDSTONE. Very thinly laminated | | | | | | | | | | | | 25.50m: DD, end of run | | | | | | | | |
| | 25.85m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | 25.65m: B, 5° dip, ST, SM, VN, CL | | | | | | | | |
| | 26.00 - 26.15m: Very thin to moderately thin (20 to 80mm) beds of SILTSTONE. | | | | | | | | | | | | 26.05m: DD, hammer break | | | | | | | | |
| | 26.15m: Unweathered laminated, grey, fine to medium carbonaceous SANDSTONE. Weak to moderately strong | | | | | | | | | | | | 26.40m: DD, hammer break | | | | | | | | |
| Pakiri Formation | 26.65m: Unweathered, interbedded, SILTSTONE and fine SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 167 | 26.5 |  | 2000 600 200 100 50 20 | 100 | 26.50m: DD, along B 0° dip, UN, R, VN, CL | | | | 25 | | | | |
| | 26.75m: Unweathered, grey, fine to medium SANDSTONE. | | | | | | | | | | | | 26.67m: J, 25° dip, UN, SM, VN, CL | | | | | | | | |
| | 27.05m: carbonaceous band. | | | | | | | | | | | | 26.97m: DD, 0° dip | | | | | | | | |
| | 27.3m: Unweathered, interbedded grey fine to medium SANDSTONE and SILTSTONE. Weak to moderately strong | | | | | | | | | | | | 27.00m: DD, end of run | | | | | | | | |
| | 27.32m: DD, 0°-30° dip, ST, SM, VN, CL | | | | | | | | | | | | 27.40m: J, 45° dip, UN, SM, VN, CL, along calcite vein 5-0mm thick | | | | | | | | |
| | 27.50 - 27.60m: Calcite vein 45°, >1mm | | | | | | | | | | | | 27.58m: DD, hammer break | | | | | | | | |
| | Thinly to moderately thinly bedded SILTSTONE and fine grained SANDSTONE. | | | | | | | | | | | | 27.80m: DD, hammer break | | | | | | | | |
| | 27.97m: Calcite vein, >1mm | | | | | | | | | | | | 28.15m: Calcite vein, >1mm | | | | | | | | |
| | 28.15m: Unweathered, interbedded, grey, fine to medium SANDSTONE and SILTSTONE. Weak to moderately strong. Beds are moderately thin (80mm to 200mm) | | | | | | | | | | | | 28.20m: DD, hammer break | | | | | | | | |
| | 28.75 - 28.85m: Fine to coarse SANDSTONE | | | | | | | | | | | | 28.55m: DD, 5° dip, UN, SM, VN, CL | | | | | | | | |
| Pakiri Formation | 28.8m: Unweathered, grey SILTSTONE. Weak to moderately strong. | | UW | MS | HQTT | 100 | | 165 | 29.0 |  | 2000 600 200 100 50 20 | 93 | 28.69m: DD, hammer break | | | | 25 | | | | |
| | 28.90 - 29.00m: some lenses of fine to medium grained SANDSTONE. | | | | | | | | | | | | 28.75m: J, 60° dip, UN, R, VN, calcite deposits along vein | | | | | | | | |
| | 29.35m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. Minor carbonaceous laminae | | | | | | | | | | | | 28.95m: J, 30° dip, UN, SM, VN, CL | | | | | | | | |
| | 29.6m: Unweathered, grey, SILTSTONE, minor thin (20 to 60mm) beds of fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | 29.20m: DD, hammer break | | | | | | | | |
| | | | | | | | | | | | | | 29.30m: J, 0-30° dip, UN, R, VN, CL | | | | | | | | |
| Pakiri Formation | 29.58m: B, 5° dip, at top of siltstone, ST, SM, VN, CL | | UW | MS | HQTT | 100 | | 164 | 29.5 |  | 2000 600 200 100 50 20 | 93 | 29.58m: B, 5° dip, at top of siltstone, ST, SM, VN, CL | | | | 25 | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 7 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|------------------|--|---|----------------------------------|----------------|-----------------|-------------------|---------|--------|-----------|------------------|---------------------------------------|-----------------------|--------------------------|---------------------------------------|----------------|-------------|--------|----------------------|---|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | |
| Pakiri Formation | 30.0m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. Some carbonaceous banding. | | UW MM CW US MS EW | US MS EW | HOTT | 100 | | 163 | 30.0 | [Yellow pattern] | 2000 600 200 100 50 20 | 100 | 30.12m: DD, hammer break | 25 50 75 | | | | Box 10, 28, 7-31, 3m | |
| | 30.12m: Unweathered, grey SILTSTONE, some thin (up to 60mm) SANDSTONE beds. Weak to moderately strong. | | | | | | | | | | | | | | | | | | 30.55m: J, 0°-90° dip, UN, SM, VN, CL |
| | 31.1m: Unweathered, fine to medium SANDSTONE. Weak to moderately strong. Some siltstone bedding in top 100mm. | | | | | | | | | | | | | | | | | | 30.70m: DD, hammer break |
| | 31.62m: Unweathered, interbedded, dark grey SILTSTONE and fine to medium SANDSTONE. Weak to moderately strong. Beds are very thin to moderately thin (30mm to 200mm) | | | | | | | | | | | | | | | | | | 31.25m: DD, hammer break |
| | 32.75m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | 31.45m: DD, 5° dip, ST, SM, VM, CL |
| | 32.95m: Unweathered, grey, SILTSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | 31.65m: J, 5° dip, ST, SM, VN, calcite vein |
| | 33.0m: Unweathered, interbedded grey SILTSTONE and fine to medium SANDSTONE. Weak to moderately strong. Very to moderately thin bedding (>80mm). | | | | | | | | | | | | | | | | | | 31.80m: DD, hammer break |
| | 33.5m: Unweathered, grey, SILTSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | 31.97m: B, 10° dip, UN, SL, VN, CL |
| | 33.64m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | 32.0m: DD, hammer break |
| | 33.75m: Unweathered, grey SILTSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | 32.37m: B, 10° dip, UN, SM, VN, CL |
| | 34.0m: Very thinly interbedded fine grained SANDSTONE and SILTSTONE. | | | | | | | | | | | | | | | | | | 32.5m: DD, hammer break |
| | 34.75m: Unweathered, grey, fine to medium SANDSTONE. | | | | | | | | | | | | | | | | | | 33.00m: DD, end of run break |
| | | 33.50m: B, 10° dip, UN, SM, VN, CL | | | | | | | | | | | | | | | | | |
| | | 33.70m: J, 70° dip, UN, R, VN, CL | | | | | | | | | | | | | | | | | |
| | | 34.00m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 34.12m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 34.20m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 34.50m: DD, end of run break | | | | | | | | | | | | | | | | | |
| | | 34.84m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 34.94m: DD, hammer break | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 8 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | |
|---|--|---|--|--|----------------------------|-------------------|---------|--------|-----------|---------------|--|-----------------------|--------------------------|---------------------------------------|----------------|-------------|--------|--------------|---------------------|------|--------------------------|------|--------------------------------|------|--|-----|--------------------------|------|---|------|--|-----|------------------------------------|------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | | | | | | | | | | | | | |
| Pakiri Formation | 34.83-35.0m: Unweathered, grey interbedded, fine to medium grained SANDSTONE and SILTSTONE. Weak to moderately strong. Very to moderately thin bedding. | | UW MW SW CW US MS SS ES US MS SS ES US MS SS ES | US MS SS ES US MS SS ES US MS SS ES US MS SS ES | HQTT | 100 | | 158 | 35.0 | [Graphic Log] | 2000 600 400 200 100 50 20 | 100 | 35.10m: DD, hammer break | 25 50 75 | | | | | Box 12, 34, 1-36.4m | | | | | | | | | | | | | | | | |
| | 35.0m: Unweathered, grey, interbedded, fine to medium grained SANDSTONE and SILTSTONE. Weak to moderately strong. Very to moderately thin bedded (>100mm). | | | | | | | | | | | | | | | | | | | 35.5 | 35.50m: DD, hammer break | | | | | | | | | | | | | | |
| | 36.09m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | | | | 36.0 | 36.85m: DD, 0°-10°, ST, SM, VN | | | | | | | | | | | | |
| | 36.21m: Unweathered, grey SILTSTONE, with some very thin, fine grained SANDSTONE bedding. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | 36.5 | 36.30m: B, 10° dip, UN, SM, VN, CL 36.42m: DD, hammer break | | | | | | | | | | |
| | 36.4m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | | | | | | | | 157 | 36.70m: DD, hammer break | | | | | | | | |
| | 36.82-37.0m: Some thin to very thin siltstone bedding. 37.00m: becomes fine to coarse grained. | | | | | | | | | | | | | | | | | | | | | | | | | | | 37.0 | 36.85m: DD, hammer break 37.00m: B, 10° dip, UN, SM, VN, grey silt | | | | | | |
| | 37.20 - 37.30m: some calcareous streaks. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 37.5 | 37.79m: B, 5° dip, ST, SM, VN, CL 37.80m: B, 5° dip, UN, SM, VN, CL 37.90m: DD, hammer break 38.15m: DD, hammer break | | | | |
| | 37.40m: trace fine gravel. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 156 | 38.56m: B, 10° dip, UN, SL, VN, CL | | |
| | 37.72m: 100mm siltstone bed, becomes fine to medium grained sandstone. 37.85 - 37.90m: carbonaceous streaks. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.0 | 39.00m: becomes fine to medium grained, gravel absent. |
| | 38.00m: becomes fine to coarse grained. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38.30m: becomes fine to medium grained. | | 39.5 | 39.60m: DD, hammer break | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38.54 - 38.56m: siltstone bed, 10°. 38.60m: becomes fine to coarse grained. 38.64 - 38.76m: carbonaceous bands. | | | | 154 | 39.80m: trace fine gravel. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38.80m: trace fine gravel. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39.00m: becomes fine to medium grained, gravel absent. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39.40m: becomes fine to coarse grained. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39.80m: trace fine gravel. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 9 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
 (NZTM2000) 1742575.86 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
 R.L. COLLAR: 193.70m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|---|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------------------|--------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| Pakiri Formation | 40.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | UW | MS | HQTT | 100 | | 153 | 40.0 | [Yellow dotted pattern] | 2000 | 100 | 40.20m: DD, hammer break | 25 | | | | | |
| | 40.80m: trace fine gravel. | | | | | | | | | | | | 40.50m: DD, end of run break | | | | | | |
| | 41.30m: gravel absent. | | | | | | | | | | | | 40.75m: DD, hammer break | | | | | | |
| | 42.10 - 42.20m: trace fine gravel. | | | | | | | | | | | | 41.35m: DD, hammer break | | | | | | |
| | 42.40 - 42.80m: becomes more medium to coarse grained. | | | | | | | | | | | | 41.55 - 41.90m: J, 80° dip, UN, R, VN, black and green staining | | | | | | |
| | 43.55m: Interbedded SILTSTONE and fine to coarse SANDSTONE. Thin to very thin bedding. Weak to moderately strong | | | | | | | | | | | | 42.00 - 42.10m: J, 70° dip, UN, R, VN, black staining penetrates 1-2mm under rock | | | | | | |
| 43.9m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | 42.50m: DD, hammer break | | | | | | | | | | | | | | | | | |
| 44.25m: Interbedded unweathered, grey, fine to medium SANDSTONE and grey and greenish grey SILTSTONE. Very thin to moderately thin bedding. Minor calcite veins | | 43.10m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 43.65 - 43.80m: BZ, possibly crushed during drilling, medium to coarse gravel | | | | | | | | | | | | | | | | | |
| | | 43.70m: J, main joint 75°, UN, R, VN, black staining | | | | | | | | | | | | | | | | | |
| | | 43.90m: DD, hammer break | | | | | | | | | | | | | | | | | |
| | | 44.50m: DD, hammer break | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH4

SHEET: 10 OF 10

DRILLED BY: Lei & Jaz

LOGGED BY: DSAH

CHECKED: ALNA

START DATE: 09/05/2018

FINISH DATE: 14/05/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977990.94 mN
(NZTM2000) 1742575.86 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 193.70m
R.L. COLLAR: 193.70m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|------------------|---|---|--|---|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|-----------------------|------------------------------------|---------------------------------------|----------------|-------------|--------|--------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| Pakiri Formation | 45.0m: Unweathered, grey, interbedded fine to medium SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | S MS SS CS S MS SS CS S MS SS CS S MS SS CS S MS SS CS | HOTT | 100 | | 148 | 45.5 | | 2000 600 200 100 50 20 | 100 | 45.60m: DD, hammer break | 25 50 75 | | | | Box 16, 45.0-48.0m | |
| | 45.15m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. 45.25 - 45.33m: some siltstone beds, >30mm thick. | | | | | | | | | | | | | | | | | | |
| | 45.50m: 10mm carbonaceous bands. | | | | | | | | | | | | | | | | | | |
| | 45.63m: Unweathered, interbedded grey, fine to medium SANDSTONE and grey SILTSTONE. Weak to moderately strong. Very thin to moderately thin bedding (30mm to 240mm) | | | | | | | | | | | | | | | | | | |
| | 45.90m: carbonaceous band. | | | | | | | | | | | | | | | | | | |
| | 46.0m: Unweathered, grey, interbedded fine to medium SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. | | | | | | | | | | | | | | | | | | |
| | 46.15m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong. 46.25 - 46.33m: some siltstone beds, >30mm thick. | | | | | | | | | | | | | | | | | | |
| | 46.50m: 10mm carbonaceous bands. | | | | | | | | | | | | | | | | | | |
| | 46.63m: Unweathered, interbedded grey, fine to medium SANDSTONE and grey SILTSTONE. Weak to moderately strong. Very thin to moderately thin bedding (30mm to 240mm) | | | | | | | | | | | | | | | | | | |
| | 46.90m: carbonaceous band. | | | | | | | | | | | | | | | | | | |
| Pakiri Formation | 46.0m: Unweathered, grey, interbedded fine to medium SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | S MS SS CS S MS SS CS S MS SS CS S MS SS CS S MS SS CS | HOTT | 100 | | 147 | 46.0 | | 2000 600 200 100 50 20 | 100 | 45.97m: B, 15° dip, UN, SM, VN, CL | 25 50 75 | | | | Box 16, 45.0-48.0m | |
| | 46.20m: DD, 0°-15° dip, broken along bedding plane, UN, SM, VN, CL | | | | | | | | | | | | | | | | | | |
| | 46.75m: J, -30° dip, UN, SM, VN, CN | | | | | | | | | | | | | | | | | | |
| | 46.90m: B, 10° dip, UN, SM, VN, CN | | | | | | | | | | | | | | | | | | |
| | 47.40m: DD, 5° dip, UN, SM, T, CN | | | | | | | | | | | | | | | | | | |
| | 47.86m: B, 10° dip, PL, R, VN, CN | | | | | | | | | | | | | | | | | | |
| | 48.20m: B, 5° dip, UN, SL to SM, VN, CN | | | | | | | | | | | | | | | | | | |
| | 48.75 - 48.80m: J, 30° dip, VCS, UN, SM to R, VN, CN | | | | | | | | | | | | | | | | | | |
| | 49.08m: B, 5° dip, UN, SL, T-VN, CN | | | | | | | | | | | | | | | | | | |
| | 49.45m: J, 50° dip, PL, R, T-VN, CN | | | | | | | | | | | | | | | | | | |
| Pakiri Formation | 49.5m: Target depth | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | S MS SS CS S MS SS CS S MS SS CS S MS SS CS S MS SS CS | HOTT | 100 | | 144 | 49.5 | | 2000 600 200 100 50 20 | 93 | | 25 50 75 | | | | Box 17, 48.0-49.5m | |

COMMENTS: 65mm I.D. piezometer installed on Thurs 17 May 2018. Shear vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

General Log - 5/04/2019 11:16:35 a.m. - Produced with Core-GS by GeRoc

Rev.: A

BH5 Log

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 1 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | | |
|--|---|---------------|-----------------|-------------------|------------|--------|-----------|-------------|------------|-----------------------|--------------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| Fill | | | HQTT | 100 | | 161 | 0.0m | | | | | | | | | | |
| | 0.0m: Fine to coarse angular GRAVEL, some clayey silt, minor fine sand; brown. Tightly packed, wet | | | | | | | | | | | | | | | | |
| | 0.2m: SILT, minor clay, trace topsoil inclusions, trace gravel; orange brown, some pockets of brown topsoil. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 0.3m: SILT, minor clay; orange brown mottled grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 0.7m: No recovery (core loss) | | | | | | | | | | | | | | | | |
| | 1.5m - 2.0m: Push Tube | | | | | | | | | | | | | | | | |
| | 0.3m: SILT, minor clay; orange brown mottled grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 2.2m: SILT, minor clay; reddish brown mottled orange brown and light grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 2.4m - 2.45: SILT, minor clay, minor fine sand | | | | | | | | | | | | | | | | |
| | 2.75m - 2.85m: SILT, minor clay, minor fine sand | | | | | | | | | | | | | | | | |
| Residual Soil | | | HQTT | 38 | ● 43/6 kPa | 160 | 0.5m | | | | | | | | | | |
| | 2.85m: No recovery (core loss) | | | | | | | | | | | | | | | | |
| | 3.0m: Push Tube - [jammed inside dill rods] | | | | | | | | | | | | | | | | |
| | 3.1m: SILT, minor clay; reddish brown mottled orange brown and light grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 3.2m-3.35m: SILT, minor clay, minor fine sand; yellowish brown to orange brown trace reddish brown mottles | | | | | | | | | | | | | | | | |
| | 3.55m: SILT, minor clay; reddish brown mottled orange brown and light grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| | 4.3m-4.5m: No recovery (core loss) | | | | | | | | | | | | | | | | |
| | 4.5m-5.0m: Push Tube | | | | | | | | | | | | | | | | |
| | 3.0m: Push Tube - [jammed inside dill rods] | | | | | | | | | | | | | | | | |
| | 3.1m: SILT, minor clay; reddish brown mottled orange brown and light grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | |
| 3.2m-3.35m: SILT, minor clay, minor fine sand; yellowish brown to orange brown trace reddish brown mottles | | | | | | | | | | | | | | | | | |
| 3.55m: SILT, minor clay; reddish brown mottled orange brown and light grey. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | | |
| 4.3m-4.5m: No recovery (core loss) | | | | | | | | | | | | | | | | | |
| 4.5m-5.0m: Push Tube | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0,0-3.8m

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 2 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------------------------------------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| Residual Soil | 5.0m: | Clayey SILT, minor fine sand, trace fine gravel size clasts of light grey silt; reddish brown mottled orange brown and grey. Firm, saturated, low plasticity | | | SPT | 100 | 0/0 0/0 0/0 N=0 | 156 | | | | | | | | | | | |
| | 5.2-5.45m: | SILT, minor fine sand, trace clay; Light brown mottled grey, trace pink mottles | | | | | | | 5.5 | | | | | | | | | | |
| | 5.45m: | SILT, minor clay, trace fine sand; reddish brown mottled orange and grey. Firm, saturated, low plasticity | | | HQTT | 100 | | | | 6.0 | | | | | | | | | |
| | 5.8m: | SILT, some clay, some thin to moderately thin beds of sandy silt; light pink mottled grey, some very narrow beds of orange brown (limonite stained). Firm, saturated, low plasticity | | | SPT | 100 | 40/19 kPa 0/0 0/0 0/0 N=0 | 155 | | | | | | | | | | | |
| | 7.08m: | Silty fine SAND; light pink. Loose, saturated | | | HQTT | 100 | | | | 6.5 | | | | | | | | | |
| | 7.2m: | SILT, some clay, some thin to moderately thin beds of sandy silt; light pink mottled grey. Firm, saturated, low plasticity | | | SPT | 100 | 41/8 kPa 0/0 0/0 0/0 N=0 | 154 | | | | | | | | | | | |
| | 7.65m: | Silty fine SAND; pink. Loose, wet | | | HQTT | 100 | | | | 7.0 | | | | | | | | | |
| | 7.8m: | No recovery (core loss) | | | SPT | 100 | | | | 7.5 | | | | | | | | | |
| | 7.95m: | SILT, some clay; light pink mottled grey. Firm, saturated, low plasticity | | | HQTT | 100 | | | | 8.0 | | | | | | | | | |
| | 8.1m: | Sandy silt; light pink mottled grey, minor orange brown bands. Firm, saturated, low plasticity. Sand is fine | | | SPT | 100 | 47/13 kPa 0/0 1/0 2/1 N=4 | 153 | | | | | | | | | | | |
| | 8.7m: | SILT, minor clay; pink mottled grey. Firm, wet, low plasticity | | | HQTT | 100 | | | | 8.5 | | | | | | | | | |
| | 8.95m: | SILT, minor fine sand; light pink mottled grey, minor orange brown and brown limonite staining. Firm, wet, low plasticity | | | SPT | 100 | | | | 9.0 | | | | | | | | | |
| | 9.1m-9.3m: | SILT, some fine sand; reddish brown | | | HQTT | 100 | | | | 9.5 | | | | | | | | | |
| 9.3m-9.45m: | SILT, trace fine sand; light pink | | | SPT | 100 | | | | | | | | | | | | | | |
| 9.45m: | SILT, minor clay, trace fine sand; reddish brown, becoming pink from 9.6m. Firm, wet, low plasticity | | | HQTT | 100 | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 2, 3.8-5.8m

Box 3, 6.8-9.5m

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 3 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------------------------------------|--------|-----------|-------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| Residual Soil | 10.0m: SILT, some fine sand; pink mottled reddish brown. Firm, wet, low plasticity | | | | HQTT | 100 | | 151 | | | | | | | | | | |
| | 10.5m: Sandy SILT; light pink mottled reddish brown and orange brown, trace black staining. Firm, saturated, low plasticity. Sand is fine | | | | SPT | 100 | 44/6 kPa 0/0 0/1 0/1 N=2 | 10.5 | | | | | | | | | | |
| | 11.50m: Becomes light pink mottled grey | | | | HQTT | 100 | | 11.0 | | | | | | | | | | |
| | 12.0m: SILT; light grey, some dark orange brown streaks. Stiff, wet, low plasticity | | | | SPT | 100 | 60/6 kPa 1/0 1/0 0/2 N=3 | 12.0 | | | | | | | | | | |
| CW Pakiri | 12.1m: SILT, minor fine sand; light brown mottled orange brown, pink from 12.3m to 12.4m. Stiff, wet, low plasticity | | | | SPT | 100 | | 149 | | | | | | | | | | |
| | 12.5m: Sandy SILT; light brown, some dark orange brown and reddish brown staining. Stiff, wet, low plasticity | | | | HQTT | 100 | | 12.5 | | | | | | | | | | |
| | 14.00 - 14.50m: Trace fine to medium gravel size (2mm to 10mm) clasts of stiff light grey silt | | | | SPT | 100 | 82/19 kPa 0/0 0/2 1/1 N=4 | 13.5 | | | | | | | | | | |
| | | | | | HQTT | 100 | | 147 | | | | | | | | | | |
| | | | | | HQTT | 100 | 82/13 kPa | 14.5 | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 4, 9.5-12.0m

Box 5, 12.0-14.5m

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 4 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------------------------|--------|-------------------------|-------------------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| CW Pakiri | 15.0m: SILT, minor fine sand and sandy SILT; light brown some dark orange brown streaks. Stiff, wet, low plasticity | | | | SPT | 100 | 0/1 1/0 1/2 N=4 | 146 | 15.0 | [Yellow with asterisks] | | | | | | | | |
| | 15.60 - 15.70m: Trace fine gravel size clasts of light grey silt | | | | | | | | 15.5 | [Yellow with asterisks] | | | | | | | | |
| | 16.00 - 16.10m: Mottled pink | | | | HQTT | 100 | | 145 | 16.0 | [Yellow with asterisks] | | | | | | | | |
| | 16.50 - 17.00m: Becomes very stiff. Trace coarse sand to fine gravel size clasts of light grey silt | | | | | | 136/28 KPa | | 16.5 | [Yellow with asterisks] | | | | | | | | |
| | 16.65m: Lense of brown fine SAND | | | | SPT | 100 | 0/0 1/1 2/2 N=6 | | 17.0 | [Yellow with asterisks] | | | | | | | | |
| | 16.95 - 17.10m: Minor light pink mottling | | | | HQTT | 100 | | 144 | 17.5 | [Yellow with asterisks] | | | | | | | | |
| | 18.0m: SILT; grey. Very stiff, wet, low plasticity | | | | | | | 18.0 | [Yellow with asterisks] | | | | | | | | | |
| | 18.09m: Sandy SILT; light brown, some orange brown and dark orange brown streaks. Very stiff, wet, low plasticity. Sand is fine | | | | SPT | 100 | 0/0 1/2 2/3 N=8 | 143 | 18.5 | [Yellow with asterisks] | | | | | | | | |
| | 18.50 - 18.55m: Light brown fine SAND | | | | | | | 18.5 | [Yellow with asterisks] | | | | | | | | | |
| | 19.50m: Becomes light brown and grey, some orange brown streaks | | | | HQTT | 100 | | 142 | 19.0 | [Yellow with asterisks] | | | | | | | | |
| | | | | | SPT | 100 | 2/4 3/2 3/3 N=11 | | 19.5 | [Yellow with asterisks] | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 6, 14.5-17.0m

Box 7, 17.0-19.7m

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 5 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering <small>UW MW SW CW US MS SS CS US MS SS CS UW MW SW CW</small> | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) <small>25 50 75</small> | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|---------------|-----------------|-------------------|---------|--------|-----------|------------------------------|--------------|--|---------|---------------------------------------|---|-------------|--------|--------------|-------------|
| | | | | | | | | | | Defect Log | Fracture Spacing (mm) <small>2000 600 200 50 20</small> | RQD (%) | | | | | | |
| CW Pakiri | 20.0m: SILT, minor to some fine sand; light brown and grey, some orange brown and dark brown streaks. Very stiff, wet, low plasticity | | | HQTT | 100 | | 141 | 20.5 | [Yellow with black speckles] | | | | | | | | | |
| HW Pakiri | 21.05m: Silty fine SAND; grey, minor brown and orange brown staining on defects. Medium dense to dense, wet | | | HQTT | 100 | | 140 | 21.0 | [Yellow with black speckles] | | | | | | | | | |
| | 22.25 - 22.35m: Mottled greenish grey | | | | | | 139 | 22.0 | [Yellow with black speckles] | | | | | | | | | |
| | 23.20 - 23.50m: Grey mottled greenish grey | | | HQTT | 100 | | 138 | 22.5 | [Yellow with black speckles] | | | | | | | | | |
| | 24.00 - 24.05m: Greenish grey | | | | | | | 23.0 | [Yellow with black speckles] | | | | | | | | | |
| | 24.20 - 24.25m: Greenish grey | | | | | | | 23.5 | [Yellow with black speckles] | | | | | | | | | |
| | 24.60 - 25.50m: Grey with orange brown and greenish grey staining | | | | | | 137 | 24.0 | [Yellow with black speckles] | | | | | | | | | |
| | | | | | | | | 24.5 | [Yellow with black speckles] | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 8, 19.7-22.3m

Box 9, 22.3-24.9m

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 6 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|------------------|--------------|-----------------------|---------|---------------------------------------|---|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | |
| HW Pakiri | 25.0m: Silty fine SAND; grey, minor brown and orange brown staining on defects. Medium dense to dense, wet | | UW | MS | HQTT | 100 | | 136 | 25.5 | [Yellow pattern] | 2000 | 600 | 200 | 20 | | | | | | |
| | 26.15m: SILT; grey. Very stiff to hard, moist to wet, low plasticity 26.18m: Lense of light grey fine sand | | | | | | | | | | | | | | | | | | | |
| SW Pakiri | 26.4m: Slightly weathered, grey, fine to coarse SANDSTONE. Very weak | | UW | MS | HQTT | 100 | | 26.5 | 26.5 | [Yellow pattern] | 2000 | 600 | 200 | 20 | 26.40m: J, -40° dip 26.46m: J, 30° dip, UN, SM, T-VN, CN | | | | | |
| | 26.55m: Grades to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 27.31m-27.36m: Fine to medium SANDSTONE | | UW | MS | HQTT | 100 | | 134 | 27.0 | [Yellow pattern] | 2000 | 600 | 200 | 20 | 27.00m: DD | | | | | |
| | 27.5m: [Yellow pattern] | | | | | | | | | | | | | | | | | | | |
| | 27.75m: Lense of dark brownish grey SILTSTONE 27.75m-27.8m: Fine SANDSTONE 27.8m-27.8m: Dark brownish grey SILTSTONE | | | | | | | | | | | | | | | | | | | |
| | 27.5m: [Yellow pattern] | | | | | | | | | | | | | | | | | | | |
| | 27.60m: DD | | | | | | | | | | | | | | | | | | | |
| | 27.75m: B, 30° dip, to 10, ST, R, VN, CN 27.79m: J, -20° dip, UN, SM to UN, R, VN, CN 28.00m: J, 50° dip, UN, R, T-VN, CN | | | | | | | | | | | | | | | | | | | |
| 28.25m: J, -40° dip, UN, R, VN, CN 28.30m: J, -44° dip, UN, R, VN, CN 28.44m: J, 60° dip, UN, R, VN, trace brown silty fine sand & UN, SM, T-VN, CN 28.50m: J, 60° dip, UN, SM to PL, R, VN, trace grey silt 28.60m: J, 25° dip, UN, R, VN, CN | | | | | | | | | | | | | | | | | | | | |
| 28.9m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 133 | 28.5 | 29.0 | [Yellow pattern] | 2000 | 600 | 200 | 20 | 29.00m: DD, Hammer break | | | | | |
| 29.28 - 29.31m: Carbonaceous | | | | | | | | | | | | | | | | | | | | |
| 29.31m-29.35m: SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 29.35m: Unweathered, grey, fine to medium SANDSTONE, grading to fine to coarse SANDSTONE from 29.45m. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | |
| 29.88m: Fine to medium SANDSTONE 29.88 - 29.90m: Very thin lenses of grey SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 29.30m: J, 30° dip, UN, SM T-VN, CN 29.35m: B, 0° dip, UN, SM, VN, CN 29.50m: DD, Hammer break | | | | | | | | | | | | | | | | | | | | |
| 29.88m: B, 0° dip, UN, SM, VN, CN | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 10, 24.9-27.6m

Box 11, 27.6-30.0m



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 7 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
(NZTM2000) 1742359.43 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
R.L. COLLAR: 161.20m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|--|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|--|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 29.88m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 131 | | | | | 30.00m: DD, 2° dip, UN, SM, T, CN | | | | | | | |
| | 30.48 - 30.52m: Carbonaceous | | | | | | | 30.5 | | | | | 30.25 - 30.50m: J, 70° dip, UN, SM, VN, grey silt | | | | | | | |
| | 30.72m: Unweathered, dark grey, SILTSTONE, some very thin beds of fine SANDSTONE. Weak | | | | HQTT | 100 | | 130 | | | | 73 | 30.73m: J, 40° dip, UN, SM, T-VN, CN 30.75m: BF, 5° dip, ExCS, UN, SL to SM, VN, grey silt 30.84m: J, 70° dip, UN, SM, T-VN, CN 30.85m: J, 15° dip, UN, SM, VN, grey silt 30.95m: J, 2° dip, UN, SM, VN, grey silt [Drilling polished] 31.10 - 31.40m: J, VCS, 0 to 90, UN, SL to SM, T to VN, CN to grey silt 31.40 - 31.60m: BZ, Rec as f-c angular gravel, lower contact 10, UN, SM 31.59m: J, -60° dip, UN, SM, T-VN, CN 31.60m: J, 80° dip, ST, SM, VN, dark greenish grey CS 31.71m: J, 10° dip, UN, SL, T-VN, CN 31.79m: B, 5° dip, UN, R, VN, minor dark greenish grey CS 31.92m: J, 10° dip, UN, SM, T, CN 31.99m: B, 5° dip, UN, R, T, CN 32.05 - 32.25m: J, 70° dip, UN, R, VN, dark grey and greenish grey staining 32.10m: J, -60° dip, UN, SM, VN, dark brownish grey staining 32.40m: J, 0° dip, UN, R, T-VN, black CC 32.52m: J, 40° dip, UN, R, VN, dark green staining 32.55 - 32.85m: J, 40° dip, curved to 70, UN, R, VN, minor dark green staining 32.90m: J, 60° dip, UN, SM to R, VN, minor dark green staining 32.92m: J, 40° dip, UN, SM, VN, minor dark green st, faint striations 33.00m: DD, 0° dip 33.35m: J, 50° dip, UN, R, T-VN, CN 33.50m: J, -40° dip, UN, R, VN, minor green st 33.53m: J, -30° dip, UN, R, VN, minor green st 33.54m: J, 20° dip, UN, R, T-VN, CN 34.05m: J, 10° dip, UN, R, T-VN, CN | | | | | | | |
| | 31.0m-31.1m: Fine SANDSTONE, carbonaceous from 30.08 to 30.1m. | | | | | | | 31.0 | | | | | | | | | | | | |
| | 31.1m: Unweathered, dark grey, SILTSTONE some thin to moderately thin beds of fine SANDSTONE. Weak | | | | | | | 31.5 | | | | | | | | | | | | |
| | 32.05m: Unweathered, grey, fine SANDSTONE. Weak | | | | | HQTT | 100 | | 129 | | | | 60 | | | | | | | |
| | 32.45m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | 32.5 | | | | | | | | | | | |
| | 32.81m: Unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | 33.0 | | | | | | | | | | | |
| | 33.1m: Grading to fine to coarse SANDSTONE | | | | | | | | 128 | | | | | | | | | | | |
| | 33.35m: Unweathered, grey, coarse SANDSTONE. weak to moderately strong | | | | | | | | 33.5 | | | | | | | | | | | |
| | 33.6m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | 34.0 | | | | 96 | | | | | | | |
| | 33.73m: Unweathered, grey, fine SANDSTONE. Trace fine to medium sand size clasts. Weak to moderately strong | | | | | HQTT | 100 | | 127 | | | | | | | | | | | |
| | 34.5m: Grading to unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | 34.5 | | | | 80 | 34.50m: DD, 5° dip 34.63 - 34.80m: J, 70° dip, UN, R, VN, dark grey to brown staining 34.72m: J, -60° dip, UN, R, VN, dark grey staining | | | | | | |
| 34.75m: Trace dark grey coarse sand size clasts from 34.75m. | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 12, 30.0-32.4m

Box 13, 32.4-35.0m



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 8 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
(NZTM2000) 1742359.43 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
R.L. COLLAR: 161.20m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|-----------------------------------|------------------------------------|-----------------------------------|-------------------------------|------------------------------|---|------------------------------|---------------------------------------|---------------------------------------|---|--|---|-------------|--------|--------------|-------------|---|---------------------------------------|--|--|--|------------------------------|---|------------------------------|---|--|---|--|---|-----------------------------|--|--------------------------------------|--------------------------------|-----------------------------|---|-----------------------------------|------------------------------------|-----------------------------------|-------------------------------|------------------------------|---|------------------------------|---------------------------------------|--------------------------------|---|--|---|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 35.0m: Unweathered, grey, fine to medium SANDSTONE. Trace dark grey coarse sand to fine gravel size clasts from 35.0m to 35.2m. Weak. | | UW | MS | HQTT | 100 | | 126 | 35.0 | | | 2000 600 200 100 50 20 | 80 | 35.00m: J, 70° dip, UN, R, T, CN | 25 50 75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35.4m-35.62m: Minor fine to medium gravel size clasts | | | | | | | | | | | | | 35.10m: J, 60° dip, UN, R, T, CN | | | | | | 35.18m: J, 30° dip, Wavy, UN, R, T-VN, CN | 35.25m: J, 40° dip, PL, R, T-VN, CN | 35.30m: J, 70° dip, UN, R, VN, dark greenish grey st | 35.58m: J, 50° dip, UN, R, VN, dark grey st | 35.70m: J, 50° dip, UN, SM, VN, dark grey silty fine sand | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35.9m: Unweathered, grey, SILTSTONE, minor thin (40mm-60mm) beds of fine SANDSTONE. Weak | | | | | | | | | | | | | 35.89m: B, 2° dip, UN, SL, T-VN, CN | | | | | | 36.00 - 36.05m: DD, Rec f-c gvl | 36.35m: J, 0 to 15 dip, UN, SM, T, CN | 36.52m: J, 50° dip, to 0, UN, SM, T, CN | 36.60 - 36.65m: BZ, Rec c gvl. Upper contact is on orthogonal 70 deg & 0 deg, UN, SL, T-VN, CN, and -70, UN, R | 36.72 - 36.85m: BZ, Rec m-c gvl with J, 60-90, UN, SM to PL, R. Upper contact is on orthogonal 70 deg & 20 deg, UN, SM to SL, T-VN, CN | 37.00m: J, 0, UN, SL, VN, CN | 37.16m: J, 2° dip, UN, SL, VN, brown CS | 37.20m: J, 5 UN, SM, VN, CN | 37.27m: J, 20, UN, R, T-VN, CN to 0, UN, SL, T-VN, CN | 37.34 - 37.50m: BZ, Rec f-c gvl. Gvl surfaces are UN, SL with grey silt, and dark green staining | 37.50 - 37.60m: J, VCS, 0-90, UN, R, to PL, R, T-VN, CN | 37.70m: J, 0, UN, SM, VN, CN [DD] | 37.85 - 37.95m: J, VCS, 50-70, UN, SL, VN, CN | 38.00m: J, 0, UN, SM, T, CN | 38.05m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 38.12m. Weak | 38.19 - 38.20m: Carbonaceous laminae | 38.20 - 38.23m: Fine SANDSTONE | 38.30m: J, 0, UN, SM, T, CN | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill |
| | 38.05m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 38.12m. Weak | | | | | | | | | | | | | 38.30m: J, 0, UN, SM, T, CN | | | | | | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | |
| | 38.19 - 38.20m: Carbonaceous laminae | | | | | | | | | | | | | 38.30m: J, 0, UN, SM, T, CN | | | | | | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | |
| | 38.20 - 38.23m: Fine SANDSTONE | | | | | | | | | | | | | 38.30m: J, 0, UN, SM, T, CN | | | | | | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | |
| | 38.46m-38.58m: SILTSTONE | | | | | | | | | | | | | 38.30m: J, 0, UN, SM, T, CN | | | | | | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | |
| 38.58m: Unweathered, grey, fine SANDSTONE. Carbonaceous from 38.58m to 38.68m. Weak | | 38.30m: J, 0, UN, SM, T, CN | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38.8m: Unweathered, interbedded SILTSTONE and fine SANDSTONE. Weak. Beds are thin to moderately thin (20 to 120mm). | | 38.30m: J, 0, UN, SM, T, CN | 38.35m: J, 60° dip, UN, SM, VN, calcite | 38.46m: B, 2° dip, UN, SM, VN, CN | 38.72m: J, 60° dip, UN, SM, VN, CN | 38.75m: J, 90° dip, PL, R, VN, CN | 38.80m: B, 0, UN, R, T-VN, CN | 38.95m: B, 0, UN, SL, VN, CS | 39.09 - 39.22m: J, 0-40, UN, SM to ST, SM, T-VN, CN | 39.40m: J, 0, UN, SL, VN, CN | 39.60m: J, 2-10 dip, UN, SM, T-VN, CN | 39.70m: J, 5, UN, SM, T-VN, CN | 39.77 - 39.90m: J, VCS, 5, UN, SL, T-VN, CN | 39.90 - 40.00m: J, 80° dip, VCS, UN, SM, VN, grey silt and dark green staining | 39.92m: J, 0° dip, UN, SL, VN, silty fine sand infill | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

General Log - 5/04/2019 11:16:38 a.m. - Produced with Core-GS by GeRoc

Box 14, 35.0-37.7m

25/05/2018, 3:25pm, 39.69m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 9 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|--|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 40.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | SM | HQTT | 100 | | 121 | | | | 40 | 40.00 - 40.14m: J, 70° dip, UN, SM, VN, grey silt, dark grey minor dark green staining 40.16m: J, 10° dip, UN, SM, T-VN, CN 40.32m: J, 10° dip, to 20, UN, SM T-VN, CN | | | | | | | |
| | 40.65-41.25m: Trace fine to medium dark grey gravel size clasts (lenses of siltstone) | | | | | | | | | | | | 40.50m: DD, 30° dip, UN, SM to ST, SM, T, CN 40.52m: J, 60° dip, UN, SM, T-VN, CN 40.55m: J, 35° dip, UN, SM to ST, SM, T-VN, CN 40.58m: J, 60° dip, UN, SL, VN, grey silt, trace calcite | | | | | | | |
| | 40.95-41.1m: Dark grey, fine to coarse SANDSTONE. Weak 41.05m: Lense of dark brown SILTSTONE 41.10 - 43.10m: Very closely spaced to closely spaced (approx. 20mm to 120mm) very narrow calcite veins, approx 40 deg dip | | | | HQTT | 100 | | 120 | | | | 65 | 40.62 - 40.90m: J, 90° dip, UN, R, VN, grey silt, minor green staining 40.75m: J, 30° dip, UN, SM to ST, SM, T-VN, CN & orthog 30, UN, R, T-VN, CN 41.05m: DD, 20° dip, UN, SM, T, CN 41.50 - 41.68m: J, 40° dip, VCS, UN, SM, T-VN, CN to minor calcite 41.60m: J, 90° dip, UN, R, T-VN, CN 41.68 - 41.80m: J, 60° dip, UN, R, T-VN, CN | | | | | | | |
| | 41.55m-41.65m: Grades to fine to medium SANDSTONE | | | | | | | 119 | | | | | 42.00m: DD | | | | | | | |
| | 42.8m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | HQTT | 100 | | 118 | | | | 93 | 42.60m: DD, 10° dip | | | | | | |
| | 42.9m-43.0m: Fine to coarse SANDSTONE | | | | | | | | | | | | | 42.98m: J, 40° dip, UN, SM - R, VN, calcite 43.10m: J, 40° dip, UN, SM, VN, calcite | | | | | | |
| | 43.2m: Unweathered, grey, fine SANDSTONE. Trace coarse sand to fine gravel size clasts from 43.2m to 43.3m. Weak to moderately strong | | | | | | | | | | | | | 43.29m: J, 30° dip, UN, R, T-VN, CN | | | | | | |
| | 43.3m-43.6m: Fine to medium SANDSTONE | | | | | | | | | | | | | 43.30 - 44.40m: J, 80° dip, to 90, UN, SM, VN (approx 2mm), minor calcite, grey silt 43.50m: DD, Orthog 30 and -10, UN, R, T-VN, CN 43.90m: J, 60° dip, UN, SM, T-VN, CN | | | | | | |
| | 44.42 - 44.71m: Calcite vein, narrow (4mm), 90 deg dip | | | | | | | | | | | | | 44.40m: J, 50° dip, to 60, UN, SM, VN, grey silt 44.42m: J, -50° dip, UN, SM, T, CN | | | | | | |
| | 44.52m: Slightly carbonaceous. Minor medium to coarse gravel size lenses of grey SILTSTONE 44.68 - 44.71m: Grey SILTSTONE | | | | | | | | | | | | | 44.71m: B, 5° dip, UN, SM, VN, grey silt | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH5

SHEET: 10 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 15/05/2018

FINISH DATE: 17/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer Site Plan

CO-ORDINATES: 5977990.27 mN
 (NZTM2000) 1742359.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 161.20m
 R.L. COLLAR: 161.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 45.0m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | | | | | | 116 | | | | 45.00m: B, 2° dip, UN, SM, T-VN, trace grey silt | | | | | | | |
| | 45.14m-45.17m: Grey SILTSTONE | | | | | | | | | | | | 45.15m: J, 0° dip, UN, SL, VN, calcite | | | | | | | |
| | 45.17m: Unweathered, grey, fine SANDSTONE, minor thin to moderately thin beds of fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | 45.5 | | | | 45.43m: DD, 5° dip, Hammer break | | | | | | | |
| | 45.7m-45.8m: Fine to coarse SANDSTONE | | | | HQTT | 100 | | | | | | 100 | 45.60m: DD, 2° dip, Hammer break | | | | | | | |
| | 45.83m-45.86m: Fine to coarse SANDSTONE | | | | | | | | | | | | 45.83m: B, 10° dip, UN, R, T-VN, CN | | | | | | | |
| | 45.95m: Unweathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts. Weak to moderately strong | | | | | | | | 46.0 | | | | | 46.13m: DD, 2° dip, Hammer break | | | | | | |
| | 46.22m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | 46.5 | | | | | 46.35m: DD, 5° dip | | | | | | |
| | | | | | | | | | | | | | | 46.42 - 46.78m: J, 70° dip, ExCS, UN, SM to R, VN, minor brown FeSt and grey silt | | | | | | |
| | | | | | | | | | | 47.0 | | | | 46.50m: DD, 0° dip | | | | | | |
| | | | | | | | | | | 47.5 | | | | 46.95m: J, 60° dip, UN, SM, VN, brown FeSt | | | | | | |
| | 47.1m: Unweathered, dark grey, fine to medium SANDSTONE. Very weak to weak | | | | HQTT | 100 | | | 114 | | | 93 | 47.12 - 47.15m: J, 5 to 30, UN, R, T, CN | | | | | | | |
| | 47.2m: Unweathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts. Weak to moderately strong | | | | | | | | | | | | 47.73m: DD, 0 to 10 deg | | | | | | | |
| | 48.0m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong 48.00 - 48.10m: Minor medium to coarse sand and fine gravel size clasts of dark grey siltstone | | | | | | | | 48.0 | | | | 47.97m: DD, 10° dip, UN, R, T-VN, CN | | | | | | | |
| | 48.50 - 48.52m: Carbonaceous 48.54 - 48.58m: Trace medium gravel size clasts of dark grey siltstone | | | | | | | | 48.5 | | | | 48.00m: B, 0° dip | | | | | | | |
| | 48.56 - 49.05m: Trace medium to coarse sand and fine gravel size clasts of dark grey siltstone. Medium gravel size clast at 48.85m. | | | | HQTT | 100 | | | 49.0 | | | 100 | 48.50m: J, 10° dip, UN, SM, VN, carbonaceous | | | | | | | |
| | 49.5m: Target depth | | | | | | | | 49.5 | | | | 48.92m: DD, 0 to 30 (curved), UN, SM, T, CN | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BH6 Log

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 1 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|---|---|-----------------|---------------|-----------------|-------------------|--|--------------------------|-----------|-------------|---|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Fill | 0.0m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 0.1m: Highly weathered, brown, fine SANDSTONE. Extremely weak, some black carbonaceous staining on defects. [Fine SAND; brown. Tightly packed, wet] | | | | | | | | | | | | | | | | | | | |
| | 0.3m: Fine SAND; brown, minor black carbonaceous staining on defects. Loosely packed, wet. | | | | | | | | | | | | | | | | | | | |
| | 0.55m: SILT, some fine sand; brown. Firm, wet, non plastic to low plasticity | | | | HQTT | 40 | | ● 38/16 kPa | | | | | | | | | | | | |
| | 0.6m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 1.5-2.0m: Push Tube | | | | PT | 100 | | | | | | | | | | | | | | |
| | 2.0m: Fine SAND, minor silt, some black carbonaceous streaks. Pinkish brown, becoming brown with black streaks from 2.04m. Loose, wet | | | | SPT | 100 | | 0/0 0/1 0/1 N=2 | | | | | | | | | | | | |
| | 2.20m: Brown mottled light brown | | | | | | | | | | | | | | | | | | | |
| | 2.35m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | Residual Soil | 2.45m: Fine SAND, minor to some silt; brown mottled light brown, some thin black carbonaceous streaks. Loose, wet | | | | HQTT | 100 | | | | | | | | | | | | | |
| 3.1m: Clayey SILT, minor to some fine sand; light brown becoming orange brown from 3.3m. Firm to stiff, wet, low plasticity. Minor limonite staining | | | | SPT | 77 | | ● 32/6 kPa 0/0 1/0 1/1 N=3 | | | | | | | | | | | | | |
| 3.65m: Fine SAND, trace silt; brown. Loose, wet | | | | HQTT | 100 | | | | | | | | | | | | | | | |
| 4.2m: Sandy SILT; brown mottled light grey and reddish brown. Firm to stiff, wet, low plasticity. Sand is fine | | | | | | | | | | | | | | | | | | | | |
| 4.4m: Fine SAND; light brown. Loosely packed, wet | | | | | | | | | | | | | | | | | | | | |
| 4.5m: Clayey SILT; orange brown. Stiff, wet, moderate to high plasticity | | | | SPT | 100 | | 0/0 0/0 0/1 N=1 | | | | | | | | | | | | | |
| 4.75m: Clayey SILT, minor fine sand; brown becoming light greyish brown from 4.85m | | | | | | | | | | | | | | | | | | | | |
| 4.9m: SILT, some clay; grey. Stiff, wet, low pl | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | 4.30 - 4.34m : Limonite band, recovered as sandy fine gravel | | | | | | | | | |
| | | | | | | | | | | | 4.50 - 4.52m : Limonite band, recovered as orange brown sandy fine gravel | | | | | | | | | |
| | | | | | | | | | | | 112mm Casing to 8.7m | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preseneted shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-4.0m

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 2 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
(NZTM2000) 1741642.79 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
R.L. COLLAR: 128.00m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|---|--|---|-----------------|--|-----------------|-------------------|------------|--------|-----------|-------------|---------------------------------------|-----------------------|---------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Residual Soil | 5.0-5.5m: Push Tube | | UW MW CW | US MS WS MS US MS WS MS US MS WS MS | PT | 100 | | 121 | 5.5 | [X] | 2000 600 200 200 20 20 | | | | | | | | | |
| | 5.5m: SILT & CLAY; light brown mottled orange brown. Stiff, wet, moderate to high plasticity | | | | | | | | | | | | | | | | | | | |
| CW Pakiri | 5.65m: Fine to coarse SAND, trace silt; brown. Loose, wet | | UW MW CW | US MS WS MS US MS WS MS | HQTT | 0 | SPT 100 | 121 | 6.0 | [X] | 2000 600 200 200 20 20 | | | | | | | | | |
| | 5.75m: SILT, minor fine sand, some layers of SILT, some fine sand; light brown with reddish brown limonite staining on defects. Loose, wet | | | | | | | | | | | | | | | | | | | |
| | 6.45m: SILT, trace clay, trace fine to medium sand; light greyish brown. Very stiff to hard, non plastic (fissile) | | | | | | | | | | | | | | | | | | | |
| MW Pakiri | 6.7m: Moderately weathered, brown fine to medium SANDSTONE. Extremely weak to very weak | | UW MW CW | US MS WS MS US MS WS MS | HQTT | 100 | SPT 100 | 119 | 6.5 | [X] | 2000 600 200 200 20 20 | | | | | | | | | |
| | 6.70 - 6.90m: J, 5 to 90, UN, SL to ST, SM, VN, FeSt | | | | | | | | | | | | | | | | | | | |
| | 6.95m: J, 10° dip, 10, PL, R, VN, FeSt, black st | | | | | | | | | | | | | | | | | | | |
| | 7.00m: DD, 0° dip | | | | | | | | | | | | | | | | | | | |
| | 7.13m: J, 0° dip, PL, R, VN, FeSt, brown silt | | | | | | | | | | | | | | | | | | | |
| | 7.28m: J, 10° dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | |
| | 7.35m: J, 60° dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | |
| | 7.45m: J, 90° dip, UN, SM to R, VN, FeSt | | | | | | | | | | | | | | | | | | | |
| | 7.50 - 7.60m: J, 80° dip, to 90, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | |
| | 7.60 - 7.70m: J, 50° dip, UN, SM to R, VN, black st, FeSt | | | | | | | | | | | | | | | | | | | |
| 7.70 - 7.80m: BZ, Rec f-c gvl | | | | | | | | | | | | | | | | | | | | |
| 7.85m: J, 50° dip, UN, SL to SM, VN, black st | | | | | | | | | | | | | | | | | | | | |
| 7.95m: J, 20° dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.05m: J, 60° dip, UN, SM, T-VN, CN & 65, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.20m: J, 25° dip, UN, SM, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.25m: J, 5, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.60m: B, 10° dip, UN, SM, N, dark orange brown fine sand, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.80m: J, 5° dip, ST, SM, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 8.90m: J, 50° dip, UN, R, VN, FeSt & orthog 20, UN, R, VN, V | | | | | | | | | | | | | | | | | | | | |
| 9.00 - 9.20m: J, 50° dip, UN, R, VN, minor FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.10m: J, Curving 50 to -50 deg, UN, SM, VN, minor FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.20m: BZ, Rec f-c gvl | | | | | | | | | | | | | | | | | | | | |
| 9.30m: J, 5, UN, SM, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.55m: J, 30° dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.56 - 9.75m: J, 0 to 90 dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.75m: J, 70° dip, UN, R, VN, FeSt | | | | | | | | | | | | | | | | | | | | |
| 9.88m: B, 20, UN, SM, VN, CN | | | | | | | | | | | | | | | | | | | | |
| 9.92m: J, 20, UN, SM, VN, CN | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preset shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 2, 4.0-6.9m

112mm Casing to 8.7m

Box 3, 6.9-9.8m

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 3 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | | | | | |
|-----------------|---------------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--------------|---|---|-------------|--------|--------------|-------------|--|--|--|
| | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | |
| UW Pakiri | UW | MS | HQTT | 93 | | | | | | | | 10.10m: J, 20° dip, UN, SM, VN, CN | | | | | | | | |
| | UW | MS | | | | | 10.5 | | | | 67 | 10.50m: DD, 0° dip | | | | | | | | |
| | UW | MS | HQTT | 100 | | | 11.0 | | | | 84 | 10.70m: B, 10° dip, UN, SM, VN, CN 10.81m: J, 15° dip, UN, SM, VN, CN | | | | | | | | |
| | UW | MS | | | | | 11.5 | | | | | 11.23m: J, 10° dip, ST, SL, VN, trace grey silt 11.40m: J, 30° dip, ST, R, VN, CN 11.50m: J, 10° dip, ST, R, VN, CN | | | | | | | | |
| | UW | MS | | | | | 12.0 | | | | | 11.88m: B, 10° dip, UN, SM, VN, CN 11.95m: B, 10° dip, UN, SM, VN, grey silt 12.00m: DD, 0° dip 12.20m: DD, 0° dip, Hammer break | | | | | | | | |
| | UW | MS | HQTT | 100 | | | 12.5 | | | | | 94 | 12.55m: DD, 0° dip, Hammer break | | | | | | | |
| | UW | MS | | | | | 13.0 | | | | | | 12.80m: B, 5° dip, UN, SM, VN, CN 12.90m: B, 10° dip, UN, SM, VN, CN | | | | | | | |
| | UW | MS | | | | | 13.5 | | | | | | 13.50m: DD, 0° dip | | | | | | | |
| | UW | MS | HQTT | 100 | | | 14.0 | | | | | 100 | 13.75m: J, 2° dip, UN, SM, VN, CN | | | | | | | |
| | UW | MS | | | | | 14.5 | | | | | | 14.82m: B, 10° dip, ST, SL, VN, CN | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preset shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 4 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|---------------------|---------------|-----------------|-------------------|---------|---|---|-------------|------------|-----------------------|--|---|--|--|--|----------------|-------------|--------|--------------|-------------|--|
| | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | |
| UW Pakiri | UW | MS | HQTT | 100 | | 111 | 14.82m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Thin bed of SILTSTONE at 15.08m. Weak to moderately strong | | | | 15.11m: B, 5° dip, UN, SM, VN, CN | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 111 | 15.11m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 15.50 - 15.56m: Thin (60mm) bed of grey SILTSTONE 15.56 - 15.60m: Carbonaceous, fine to medium SANDSTONE | | | | 15.50m: B, 10° dip, UN, SM to R, VN, CN 15.52m: J, 10° dip, UN, SM, VN, CN | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 111 | 15.6m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported. Weak to moderately strong | | | | | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 111 | 15.65m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 111 | 16.1m-16.2m: Minor fine to medium gravel size clasts | | | | | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 110 | 16.5m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | 16.50m: DD, 0° dip | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 110 | 16.65m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | 16.65m: J, 10° dip, UN, R, VN, CN | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 109 | 17.22m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. 17.28m-17.4m: Fine to coarse SANDSTONE, trace to minor fine gravel size clasts | | | | | 17.50m: J, 20° dip, UN, R, VN, black st | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 109 | 17.4m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong 17.55m: Grades to fine to coarse SANDSTONE | | | | | | | | | | | | | | |
| | UW | MS | HQTT | 100 | | 108 | 18.22m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong 18.23m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong 18.28m: Grades to fine to coarse SANDSTONE | | | | | 18.00m: DD, 0° dip 18.22m: J, 5° dip, to 10, UN, R, VN, CN | | | | | | | | | |
| UW | MS | HQTT | 100 | | 108 | 19.05-19.08m: Carbonaceous 19.08-19.13m: Fine to coarse SANDSTONE with trace to minor fine gravel size clasts | | | | | 18.80m: DD, 40° dip, hammer break 19.05m: J, 10° dip, UN, R, VN, minor black st | | | | | | | | | | |
| UW | MS | HQTT | 100 | | 107 | 19.5m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong 19.75m-19.82m: Fine SANDSTONE 19.70 - 19.80m: Very narrow calcite vein, approx 60 dip | | | | | 19.50m: DD, 0° dip 19.75m: B, 0° dip, to 20, UN, SM, T, CN (hammer break) | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preshefeted shear vane readings have been corrected.

Hole Depth
49.5m

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 5 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | |
|-----------------|---|---|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering UW MW SW CW US MS SS CS UW MW SW CW US MS SS CS | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 20.0m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | HQTT | 100 | | 106 | 20.5 | | | 100 | 20.25m: DD, 0° dip, Hammer break | | | | | | |
| | 21.45m: Unweathered, grey, fine carbonaceous SANDSTONE. Carbonaceous bands are very thin (up to 10mm), dipping approx. 40-50 deg. Weak | | | HQTT | 100 | | 106 | 21.0 | | | 100 | 20.70m: J, 40° dip, PL, R, VN, black st, brown staining penetrates 10mm into rock | | | | | | |
| | 21.7m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | HQTT | 100 | | 105 | 21.5 | | | 100 | 21.00m: DD, 0° dip | | | | | | |
| | 22.40 - 22.50m: Calcite vein, very narrow, approx 40 deg dip | | | | | | 105 | 22.0 | | | 100 | 21.58m: B, 50° dip, PL, R, VN, black CC | | | | | | |
| | 22.5m: Grading to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | 104 | 22.5 | | | 100 | 22.16m: DD, 0° dip, hammer break | | | | | | |
| | 22.53m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong | | | | | | 104 | 23.0 | | | 100 | 22.53m: B, 10° dip, UN, R, VN, grey silt | | | | | | |
| | 23.6m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong 23.67 - 23.72m: Carbonaceous | | | | | | 103 | 23.5 | | | 100 | 23.25m: DD, 0° dip, Hammer break | | | | | | |
| | 23.7m: Grading to fine to medium SANDSTONE 23.85m: Calcite vein, very narrow, approx 60 deg dip | | | | | | 103 | 24.0 | | | 100 | 23.53m: B, 10° dip, UN, R, VN, grey silt | | | | | | |
| | 24.25m: Grading to unweathered, grey, fine to coarse SANDSTONE, trace to minor fine to medium gravel size clasts. Weak to moderately strong | | | | | | 102 | 24.5 | | | 100 | 23.85m: DD, 60° dip, Hammer break along calcite vein | | | | | | |
| | | | | | | | 102 | 24.5 | | | 100 | 24.00m: DD, 0° dip | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preshefeted shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 6 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill

JOB No.: 1005069.1120

LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
(NZTM2000) 1741642.79 mE

DIRECTION: 0°

ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m

R.L. COLLAR: 128.00m

DATUM: NZVD2016

SURVEY: Total
Station\Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|--|---|---|--|---------------|-----------------|-------------------|---------|--------|-----------|-------------------------|---------------------------------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|-------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 25.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW MW SW CW US MS SS CS US MS SS CS US MS SS CS US MS SS CS | HOTT | 100 | | | 101 | 25.0 | [Yellow dotted pattern] | 2000 600 200 100 50 20 | 100 | | | | | | | | Box 9, 23.9-26.7m |
| | 25.33m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel size clasts in matrix of fine to coarse sand. Matrix supported. | | | | | | | | | | | | | | | | | | | |
| | 25.5m: Unweathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| | 25.7m: Grading to fine to medium SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 25.9m: Grading to fine to coarse SANDSTONE, trace fine gravel size clasts. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| | 26.22m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| | 26.40 - 26.85m: Very narrow, approx 70 dip calcite vein | | | | | | | | | | | | | | | | | | | |
| | 26.80 - 26.90m: Very narrow, approx 40 dip, calcite vein | | | | | | | | | | | | | | | | | | | |
| | 26.95m: Grades to fine to medium SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 27.00m: DD, 0° dip | | | | | | | | | | | | | | | | | | | |
| | 27.5m: Grades to fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 27.75m: Unweathered, dark grey, fine carbonaceous SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| | 28.02m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 28.1m. Weak to moderately strong | | | | | | | | | | | | | | | | | | | |
| 28.25m: Unweathered, grey, fine to coarse SANDSTONE, becoming coarse SANDSTONE from 28.4m. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | |
| 28.50 - 28.51m: SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 28.51m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | |
| 28.58 - 28.66m: Carbonaceous | | | | | | | | | | | | | | | | | | | | |
| 28.9m: Grading fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | | | |
| 29.00m: DD, 0° dip | | | | | | | | | | | | | | | | | | | | |
| 29.12m: Unweathered, grey, coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | |
| 29.23m: Unweathered, grey, fine SANDSTONE, grading to fine to coarse SANDSTONE from 29.5m. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | |
| 29.45 - 29.60m: Narrow calcite vein, approx 60 dip. | | | | | | | | | | | | | | | | | | | | |
| 29.50m: Coarse gravel size lense of SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 29.5m: DD, 0° dip | | | | | | | | | | | | | | | | | | | | |
| 29.8m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Matrix supported. | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Presetted shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 7 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------------------|--------|-----------|---------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 29.8m [Cont'd]: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported. Weak to moderately strong | | UW | CS | HQTT | 100 | Lugeon Test @ 28.5m | 96 | 30.00m | [Graphic Log] | [Defect Log] | 93 | 30.00m: DD, 0° dip | | | | | | | |
| | 30.1m: Conglomerate grades to fine gravel in a fine to coarse sand matrix. Matrix supported | | | | | | | | | | | | | | | | | | | |
| | 31.4m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | HQTT | 100 | | 96 | 31.00m | [Graphic Log] | [Defect Log] | 100 | 31.50m: DD, 0° dip | | | | | | | |
| | 31.6m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine gravel, becoming fine to medium gravel from 32.0m in a fine to coarse sand matrix. Matrix supported. | | | | HQTT | 100 | | 95 | 32.00m | [Graphic Log] | [Defect Log] | 100 | 32.35m: B, 40° dip, UN, R, VN, CC | | | | | | | |
| | 32.35m: Unweathered, grey, fine to coarse SANDSTONE, trace fine to medium gravel size clasts from 32.35m to 32.55m. Weak to moderately strong | | | | HQTT | 100 | | 94 | 33.00m | [Graphic Log] | [Defect Log] | 86 | 34.68m: DD, 10° dip, Wavy, UN, SM, T, CN | | | | | | | |
| | 33.25-33.4m: Fine to medium SANDSTONE | | | | | | | | | | | | | | | | | | | |
| | 33.68m-33.82m: Fine to coarse SANDSTONE, with minor fine gravel size clasts 33.81m: Narrow calcite vein, approx 40 dip 33.82 - 33.90m: Fine SANDSTONE | | | | HQTT | 100 | | 93 | 34.00m | [Graphic Log] | [Defect Log] | | 34.42m: B, 20° dip, UN, SM, T, CN | | | | | | | |
| | 33.9m: Unweathered, grey CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to coarse gravel, becoming fine to medium gravel from 34.0m, in a fine to coarse sand matrix. Matrix supported | | | | | | | | | | | | | | | | | | | |
| | 34.3m: Unweathered, interbedded, grey SILTSTONE and fine SANDSTONE. Weak. Beds are thin moderately thin (30mm to 120mm) 34.30 - 34.50m: Calcite Veins, VCS, very narrow (0.1 to 0.5mm) | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 11, 29.7-32.4m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 8 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------------------|--------|------------|---------------|-----------------------|---------|--|----------------|-------------|---------------|--------------|-------------|----|------|---------------|-----|----|---|----|--|--|--|---|------|-----|----|------|---------------|-----|-----|---|----|--|--|--|------------|------|-----|----|------|---------------|-----|------------|--|--|--|--|------|-----|----|------|---------------|-----|--|--|--|--|---|------|-----|----|------|---------------|-----|---|--|--|--|---------------------|------|-----|----|------|---------------|-----|---------------------|--|--|--|-----------------------------------|------|-----|----|------|---------------|-----|-----------------------------------|--|--|--|------------|------|-----|----|------|---------------|-----|------------|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 35.0m: Unweathered, interbedded, grey SILTSTONE and fine SANDSTONE. Weak. Bedding is thin to moderately thin | | UW | MS | HQTT | 100 | Lugeon Test @ 34.5m | 91 | 35.5 | [Graphic Log] | 2000 | 86 | 35.10m: DD, 15° dip, UN, R & orthog 40 deg, UN, SM, T, CN 35.18m: J, 40° dip, PL, R, VN, CN | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 37.60 - 37.80m: Calcite vein, very narrow, approx 90 deg dip | HQTT | | | | | | | | | | | | | | | | 100 | 90 | 36.0 | [Graphic Log] | 600 | 66 | 35.60m: J, -20° dip, PL, SL, VN-N, trace grey silt. Faint striations 35.68m: J, 40° dip, ST, R to UN, SM, VN, CN 35.76m: J, 40° dip, UN, SM to ST, SM, VN, CN 35.94m: J, 50° dip, UN, R, VN, CN 36.00m: DD, -10° dip 36.08m: J, 40° dip, UN, R, Moderately narrow to VN, dark grey silt 36.20m: J, 70° dip, ST, R, VN, trace grey silt 36.25m: J, 40° dip, UN, R, VN, trace silt 36.55m: J, 50° dip, UN, R, T - VN, CN 36.60m: J, 85° dip, UN, SM, VN, CN 36.70m: J, 60° dip, UN, SM to UN, R, T-VN, CN | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 37.95 - 38.75m: Very closely spaced, anastomotic very narrow to narrow calcite veins. | HQTT | 100 | 89 | 37.0 | [Graphic Log] | 200 | 100 | 37.05m: J, 5° dip, UN, SM, T-VN, CN 37.12m: J, -10° dip, UN, SM, T-VN, CN 37.18 - 37.20m: BZ, Rec f-c gvl, upper contact 60, PL, SM, VN, CS & orthog UN, SM, T-VN, CN, lower contact is 10, UN, SM, T-VN, CN 37.25m: J, 50° dip, UN, SM, T, CN 37.37m: J, 10° dip, UN, SM, VN, CN, faint striations 37.50m: DD | 75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38.05m: DD | HQTT | 100 | 88 | 37.5 | [Graphic Log] | 100 | 38.05m: DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38.23m: B, 10° dip, Hammer break on bedding, 10, UN, SM, T, CN | HQTT | 100 | 88 | 38.0 | [Graphic Log] | 100 | 38.23m: B, 10° dip, Hammer break on bedding, 10, UN, SM, T, CN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38.53m: DD, 5° dip, Hammer break on bedding, UN, R, T, CN | HQTT | 100 | 88 | 38.5 | [Graphic Log] | 100 | 38.53m: DD, 5° dip, Hammer break on bedding, UN, R, T, CN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.00m: DD, 10° dip | HQTT | 100 | 88 | 39.0 | [Graphic Log] | 100 | 39.00m: DD, 10° dip | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.25m: DD, 10° dip, Wavy, UN, SL | HQTT | 100 | 88 | 39.5 | [Graphic Log] | 100 | 39.25m: DD, 10° dip, Wavy, UN, SL | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.42m: DD | HQTT | 100 | 88 | 39.5 | [Graphic Log] | 100 | 39.42m: DD | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39.72m: DD | | | HQTT | 100 | 88 | 39.5 | [Graphic Log] | 100 | 39.72m: DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 39.91m: DD | HQTT | | | | | | | | | | | 100 | 88 | 39.5 | [Graphic Log] | 100 | 39.91m: DD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Presetfeted shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 9 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
 (NZTM2000) 1741642.79 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
 R.L. COLLAR: 128.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|---------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|--------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| UW Pakiri | 40.0m: Unweathered, interbedded, grey SILTSTONE and fine SANDSTONE. Weak | | UW | MS | HQTT | 100 | | | 40.5 | [Graphic Log] | [Defect Log] | [Fracture Spacing] | 100 | | | | | | Box 15, 40.1-42.7m | |
| | | | | | | | | | | | | | | | | | | | | 40.10m: DD |
| | | | | | | | | | | | | | | | | | | | | 40.50m: DD |
| | | | | | | | | | | | | | | | | | | | | 40.63m: B, 10° dip, UN, SL, VN, greyish brown CC |
| | | | | | | | | | | | | | | | | | | | | 40.88m: B, 10° dip, UN, SM, T, CN |
| | | | | | | | | | | | | | | | | | | | | 41.02m: DD, Hammer break on calcite vein. Orthog 60 and 90 deg, UN, R, VN, calcite |
| | | | | | | | | | | | | | | | | | | | | 41.25m: DD, 0° dip |
| | | | | | | | | | | | | | | | | | | | | 41.35m: DD, 10° dip, UN, SM, T, CN |
| | | | | | | | | | | | | | | | | | | | | 41.52m: DD, 0, ST, R, T, CN |
| | | | | | | | | | | | | | | | | | | | | 41.84m: B, 10° dip, UN, SM, VN, trace grey silt |
| | | 41.98m: B, 10° dip, UN, SM, T-VN, CN | | | | | | | | | | | | | | | | | | |
| | | 42.00m: DD, 0° dip | | | | | | | | | | | | | | | | | | |
| | | 42.13m: B, 10° dip, UN, SM, T-VN, CN | | | | | | | | | | | | | | | | | | |
| | | 42.5m: [Graphic Log] | | | | | | | | | | | | | | | | | | |
| | | 42.68m: J, 20° dip, UN, R, VN, minor CC | | | | | | | | | | | | | | | | | | |
| | | 43.00m: J, 60° dip, UN, R to ST, SM, VN, CN | | | | | | | | | | | | | | | | | | |
| | | 43.19m: J, 10° dip, UN, SM, T-VN, CN | | | | | | | | | | | | | | | | | | |
| 43.35m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 43.5m. Weak to moderately strong | | 43.5m: [Graphic Log] | | | | | | | | | | | | | | | | | | |
| 43.9m: SILTSTONE, some thin to moderately thin (20mm to 70mm) beds of fine SANDSTONE. Weak to moderately strong | | 44.0m: [Graphic Log] | | | | | | | | | | | | | | | | | | |
| | | 44.10m: DD, 2° dip, Hammer break on bedding: UN, SM, T, CN | | | | | | | | | | | | | | | | | | |
| | | 44.23m: DD, 0° dip, Hammer break on calcite vein?: PL, R, T, CN curved to 80, UN, SM, T, CN | | | | | | | | | | | | | | | | | | |
| | | 44.58m: DD, 0° dip, Hammer break: UN, SL, T, CN | | | | | | | | | | | | | | | | | | |
| | | 45.00m: DD, 0° dip | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH6

SHEET: 10 OF 10

DRILLED BY: Craig

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 07/05/2018

FINISH DATE: 10/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5978241.11 mN
(NZTM2000) 1741642.79 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 127.00m
R.L. COLLAR: 128.00m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|--|---|----|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|--|---|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 45.0m: Unweathered, dark grey, SILTSTONE. Weak | | UW | US | | | | | | | | | | | | | | | | |
| | 45.1m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | | | | | | | | | | | | | | | | |
| | 45.5m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong | | UW | US | | | | | 45.5 | | | | | 45.45m: J, 60° dip, UN, R, T-VN, CN | | | | | | |
| | 45.7m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | 100 | | | | | | | |
| | 45.82m: Grades to fine to medium SANDSTONE | | UW | US | | | | | 81 | | | | | 45.98m: DD, 0° dip, Hammer break | | | | | | |
| | 46.26m: Unweathered, dark grey SILTSTONE, some very thin beds of fine to medium SANDSTONE from 46.33m. Weak to moderately strong | | UW | US | | | | | | | | | | 46.38m: B, 15° dip, UN, SM - R, T-VN, CN 46.50m: DD | | | | | | |
| | 46.4m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | | | | | | | | | | | | | | | | |
| | 46.75m: Calcite vein, very narrow, approx 60 deg dip | | UW | US | | | | | | | | | | | | | | | | |
| | 47.7m: Grades to fine to coarse SANDSTONE | | UW | US | | | | | | | | | | | | | | | | |
| | 47.70m: Calcite vein, very narrow, approx 40 deg dip 47.92 - 47.94m: Fine to coarse SANDSTONE with minor fine gravel size clasts 48.05m: Calcite vein, very narrow, approx 40 deg dip | | UW | US | HQTT | 100 | | | | | | | | 100 | 47.00m: J, 60° dip, UN, SM - R, VN, Calcite | | | | | |
| 48.1m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | | | | | | | | | | | | | | | | | |
| 48.40 - 48.42m: Carbonaceous | | UW | US | | | | | | | | | | | | | | | | | |
| 48.40m: DD, 5° dip | | UW | US | | | | | | | | | | | | | | | | | |
| 48.40m: J, 10° dip, UN, R, T, black CC | | UW | US | HQTT | 100 | | | | | | | | 100 | | | | | | | |
| 48.85m: Grades to fine to coarse SANDSTONE | | UW | US | | | | | | | | | | | | | | | | | |
| 48.95m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong 49.15m: Grading to fine to coarse SANDSTONE 49.28 - 49.32m: CONGLOMERATE. Conglomerate is fine gravel, with trace medium gravel. Matrix supported | | UW | US | | | | | | | | | | | | | | | | | |
| 49.32m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 49.45m. Weak to moderately strong 49.40m: Very narrow calcite vein, approx 50 deg dip | | UW | US | | | | | | | | | | | | | | | | | |
| 49.5m: Target depth | | UW | US | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer installed on Friday 18 May. Shear Vane No. 111. Preseneted shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

General Log - 5042019 11:16:41 a.m. - Produced with Core-GS by GeRoc

Rev.: A

BH7 Log

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 1 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
 (NZTM2000) 1741380.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|------------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Top | 0.0m: Clayey SILT with some rootlets; brown. Soft to firm, wet, Low to moderate plasticity. | | | | | | | | | | | | | | | | | | | |
| Residual Soil | 0.2m: Silty CLAY; dark orange brown. Firm, moist, moderate plasticity. | | | | | | | 74 | | | | | | | | | | | | |
| | 0.56m: Clayey SILT, minor fine sand, trace organics; reddish brown. Firm, moist, low to moderate plasticity | | | | HQTT | 86 | | 0.5 | | | | | | | | | | | | |
| | 0.95m: Clayey SILT, some fine sand, some organics; reddish brown with black streaks. Firm, moist, low to moderate plasticity. | | | | | | | 1.0 | | | | | | | | | | | | |
| | 1.05m: Sandy SILT, trace clay, some organics; reddish brown. Firm, moist, low plasticity. Sand is fine to medium. | | | | | | | 1.5 | | | | | | | | | | | | |
| Pakihī Formation | 2.0m: Silty fine to medium SAND with minor fine gravel. Light brownish orange. Medium dense, moist | | | | | | | 2.0 | | | | | | | | | | | | |
| | 2.7m: Silty fine to medium SAND minor fine to medium gravel; light brown to reddish orange. Medium dense, moist | | | | | | | 2.5 | | | | | | | | | | | | |
| | 2.9m: Silty fine to medium SAND; light brown. Medium dense, moist | | | | | | | 3.0 | | | | | | | | | | | | |
| | 3.0m: Fine to medium SAND, minor silt; brown. Tightly packed, moist | | | | | | | 3.5 | | | | | | | | | | | | |
| Pakihī Formation | 3.4m: Highly weathered, brown, fine to medium SANDSTONE. Very weak | | | | | | | 3.5 | | | | | | | | | | | | |
| | 3.7m: J, 10° dip, UN,R,VW, HW, MN, FeSt | | | | | | | 3.7 | | | | | | | | | | | | |
| | 3.82m: J, 20° dip, PL,SM,VW, MN, CN | | | | | | | 3.8 | | | | | | | | | | | | |
| Pakihī Formation | 3.87m: J, 15° dip, UN,SM,VW, MN, CN | | | | | | | 3.9 | | | | | | | | | | | | |
| | 4.0m: J, 20° dip, PL,SM,VW, MN, CN | | | | | | | 4.0 | | | | | | | | | | | | |
| | 4.50m - 4.90m: No recovery (core loss) | | | | | | | 4.5 | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth
25.5m

Scale 1:25

18/05/2018; 1:10pm 2.73m

Box 1, 0.0-2.8m



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 2 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
(NZTM2000) 1741380.43 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|------------------|--|---|----------------------|----------------------------------|-----------------|-------------------|---------|--------|-----------|-------------|--|-----------------------|---|---------------------------------------|----------------|-------------|--------|------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| Pakiri Formation | 5.0m: Highly weathered, brown, fine to coarse SANDSTONE. Very weak to weak | | UW MW LW CN | US MS LS ES WS EW | HQTT | 73 | | 69 | 5.5 | | 2000 600 400 200 100 50 20 | 8 | 5.10 - 5.25m: J, 35° dip, PL,R,VW-W, T, CN 5.40m: J, 10° dip, PL, R, VW-W, T, CN 5.42m: J, 15° dip, UN,R,VW-W, N, CN 5.48m: J, 15° dip, UN,R,VW-W, N, CN 5.57 - 5.72m: BZ 5.85m: J, 15° dip, UN,R,VW-W, MN, FeSt 5.90m: J, 10° dip, PL,SM,VW-W,MN, FeSt 5.95m: J, 15° dip, UN,SM,VW-W, MN, FeSt 6.05m: J, 15° dip, UN,SM,W, MN, FeSt 6.08m: J, 15° dip, UN,SM,W, MN, FeSt 6.10m: J, 10° dip, PL,SM,W, MN, FeSt 6.12m: J, 10° dip, PL,SM,W, MN, FeSt 6.15m: J, 15° dip, UN,SM,W, MN, FeSt 6.16m: J, 15° dip, UN,SM,W, MN, FeSt 6.18m: J, 15° dip, UN,SM,W, MN, FeSt 6.20m: J, 15° dip, UN,SM,W, MN, CN 7.06m: J, 80° dip, UN,R,W, MN, CN | 25 50 75 | | 96mm | | Box 2, 2, 8-6.2m | |
| | 6.2m: Slightly weathered, grey, fine SANDSTONE. Weak | | | | HQTT | 100 | | 68 | 6.5 | | | 63 | | | | | | | |
| | 7.5m: Slightly weathered, grey, fine to coarse SANDSTONE. Weak | | | | | HQTT | 96 | | 67 | 7.5 | | | 96 | | | | | | |
| | | | | | | | | 66 | 8.5 | | | 100 | | | | | | | |
| | | | | | | | | 65 | 9.5 | | | | | 9.81m: J, 15° dip, UN,SM,W, MN, CN | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth 25.5m
Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 3 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
 (NZTM2000) 1741380.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|------------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| Pakiri Formation | 7.5m [Cont'd]: Slightly weathered, grey, fine to coarse SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 64 | 10.5 | | 2000 600 200 100 50 20 | 100 | 10.28m: J, 75° dip, PL,SM,W, MN-T, CN | | | | | | |
| | 10.72m: Slightly weathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | 10.74m: J, 20° dip, UN,SM,W, MN, CN | | | | | | |
| | 20.8m: Slightly weathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | | 11.12m: J, 60° dip, UN,SM,W, MN, CN | | | | | |
| | 10.95m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | 99 | 11.32m: J, 40° dip, UN,SM,W, MN, CN | | | | | |
| | 12.28m: Unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | | | | | | 11.76m: J, 35° dip, UN,SM,W, MN, CN | | | | | |
| | 12.5m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | 11.89m: J, 35° dip, UN,SM,W, MN, CN | | | | | | |
| | 13.2m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | 12.65m: J, 20° dip, UN,SM,W, MN, CN | | | | | | |
| | | | | | | | | | | | | | 12.85m: J, 30° dip, UN,SM,W, MN-MW, CN | | | | | | |
| | | | | | | | | | | | | | 12.95 - 13.05m: BZ | | | | | | |
| | | | | | | | | | | | | | 13.09m: J, 30° dip, UN,SM,W, MN,CN | | | | | | |
| | | | | | | | | | | | | | 13.96m: J, 25° dip, PL,SM,W, MN, CN | | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth 25.5m

Scale 1:25

Box 4, 9.0-11.7m

Box 5, 11.7-14.6m

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 4 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
 (NZTM2000) 1741380.43 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | |
|---|---|---|--|---------------|-----------------|-------------------|-----------|-----------|-----------|-------------|--------------|-----------------------|---------------------------------------|---------------------------------------|----------------|-------------|-----------|--------------|-------------|------|-----|-----------|----|------|-----------|-----------|-----|-----------|-------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | | | | | | | | | | | | | |
| Pakiri Formation | 13.2m [Cont'd]: Unweathered, grey, fine SANDSTONE. Weak | | UW MM CW US MS CS UW MS CW EW | [Pattern] | HQTT | 100 | [Pattern] | 59 | 15.5 | [Pattern] | [Pattern] | 100 | 15.25m: J, 75° dip, UN,SM-R,W, MN, CN | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | | | | | | | | | | | | | | | | |
| | 15.3m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | HQTT | 100 | [Pattern] | 58 | 16.0 | [Pattern] | [Pattern] | 100 | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] |
| | 18.7m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.15m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | HQTT | 100 | [Pattern] | 56 | 18.0 | [Pattern] | [Pattern] | 100 | [Pattern] | 18.72m: J, 30° dip, UN,SM,W, MN, CN | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] |
| 19.15m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | HQTT | 100 | [Pattern] | 55 | 18.5 | [Pattern] | [Pattern] | 97 | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth 25.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 5 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
(NZTM2000) 1741380.43 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|------------------|---|---|-----------------|--------------------------|-----------------|-------------------|-------------------------------------|--------|-----------|-------------|---|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|---------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Pakiri Formation | 20.0m: Unweathered, grey, fine SANDSTONE. Weak | | UW MM CW | S _u 80-100 | HQTT | 100 | | 54 | 20.5 | | 2000 600 600 600 400 400 20 | 97 | 20.24m: J, 30° dip, UN,SM,W, MN, CN 20.28m: J, 30° dip, UN,SM,W, MN, CN | | | | | | | |
| | 21.53m: Unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | 53 | 21.5 | | | | | | | | | | 100 | Lugeon Test @ 19.5m |
| | 21.9m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | 52 | 22.0 | | | | | | | | | | | |
| | 22.16m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | 51 | 23.0 | | | | | | | | | | | |
| | | 50 | 24.0 | | | 100 | 23.17m: J, 30° dip, UN,SM,W, MN, CN | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth 25.5m
Scale 1:25



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH7

SHEET: 6 OF 6

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 26/03/2018

FINISH DATE: 29/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Wayby Valley

CO-ORDINATES: 5978541.84 mN
1741380.43 mE
(NZTM2000)

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 74.42m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|------------------|--|--|----------------------------|----------------------------|-----------------|-------------------|---------|--------|-----------|-------------|---|-----------------------|---------|---------------------------------------|-----------------------------------|-------------|--------|-------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| Pakiri Formation | 22.16m [Cont'd]: Unweathered, grey, fine SANDSTONE. Weak | | UW MW CW SW EW | US MS CS SS ES | HOTT | 100 | | 49 | 25.5 | | 2000 600 600 600 200 200 20 | 100 | | 25 50 75 | DRY 18/05/2018 1:10pm 2.73m | | | Box 9, 22.8-25.5m | |
| | 25.5m: END OF BOREHOLE | | | | | | | 45 | 29.5 | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer.

Hole Depth
25.5m
Scale 1:25

BH8 Log

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 1 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------------------------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Fill | 0.0m: Fine to coarse GRAVEL; Grey. Loose, moist. Gravel is sub rounded to sub angular. | | | | | | | | 208 | | | | | | | | | | | |
| | 0.30m: No Recovery (core loss) | | | | | | | | 0.5 | | | | | | | | | | | |
| Residual Soil | 1.1m: Clayey SILT, trace gravel; dark red with orange mottling. Firm, moist, moderate plasticity. Gravel, fine-medium, sub rounded to sub angular | | | | HQTT | 46 | | | 207 | | | | | | | | | | | |
| | 1.2m: Sandy SILT; dark red with black mottling. Firm, moist, low plasticity. Sand is fine to medium | | | | | | | | 1.5 | | | | | | | | | | | |
| | 1.80 - 2.00m: No Recovery (core loss) | | | | | | | | 2.0 | | | | | | | | | | | |
| | 2.45m: SILT, some clay; light red with orange mottling. Soft to firm, moist, low to moderate plasticity | | | | PT | 60 | | 53/13 kPa | 2.06 | | | | | | | | | | | |
| | 2.7m: Clayey SILT; light pink with orange mottling. Soft-firm, moist, moderate plasticity | | | | SPT | 100 | | 1/1 1/1 1/1 N=4 | 2.5 | | | | | | | | | | | |
| Residual Soil | 3.30 - 3.50m: No Recovery (core loss) | | | | | | | 3.0 | | | | | | | | | | | | |
| | 3.95m: Fine to medium SAND, some silt; dark red with orange mottling and some black streaks. Loose, moist to wet. | | | | PT | 60 | | 26/3 kPa | 3.5 | | | | | | | | | | | |
| | | | | | SPT | 100 | | 1/1 1/2 2/2 N=7 | 4.0 | | | | | | | | | | | |
| | | | | | HQTT | 100 | | 40/11 kPa | 4.5 | | | | | | | | | | | |
| | | | | | SPT | 100 | | 1/1 2/2 2/2 N=8 | 4.5 | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 2 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------------------------|--------|-----------|-------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|-------------|---------------------------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | Description & Additional Observations |
| Residual Soil | 3.95m [Cont'd]: Fine to medium SAND, some silt, dark red with orange mottling and some black streaks. Loose, moist to wet. | | | | HQTT | 80 | | 203 | 5.5 | | | | | | | | | | |
| | 5.55m: becomes light orange brown | | | | | | | | 6.0 | | | | | | | | | | |
| | 6.00m: Becomes loose to medium dense | | | | SPT | 100 | 1/2 3/2 2/3 N=10 | 202 | 6.5 | | | | | | | | | | |
| CW Pakiri | 6.45m: Fine SAND, minor silt; light brown stained dark orange brown. Loose to medium dense, moist to wet | | | | HQTT | 100 | | 201 | 7.0 | | | | | | | | | | |
| | | | | | SPT | 100 | 1/2 2/2 3/3 N=10 | 201 | 7.5 | | | | | | | | | | |
| | | | | | HQTT | 57 | | 200 | 8.5 | | | | | | | | | | |
| | 9.0m: Fine to coarse SAND; light brown. Loose, moist to wet | | | | SPT | 100 | 1/1 1/2 2/2 N=7 | 199 | 9.0 | | | | | | | | | | |
| | 9.1m: Fine SAND, minor silt; light orange brown. Loose, moist to wet | | | | | | | | 9.5 | | | | | | | | | | |
| | 9.45m: Fine to medium SAND, trace silt; light orange brown. Loose, moist to wet 9.50m: becomes fine to coarse SAND, trace silt | | | | | | | | | | | | | | | | | | |
| | 9.6m: Fine to medium SAND, trace silt; light greyish brown with minor iron staining. Loose, moist to wet | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 3 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | ROCK DEFECTS | | | | | | | | | | | | |
|-----------------|---|-----------------|---------------|--------------------------------------|---------------------------|--------|-----------|-------------|------------|-----------------------|---------|---|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| CW Pakiri | 9.6m [Cont'd]: Fine to medium SAND, trace silt; light greyish brown with minor iron staining. Loose, moist to wet | | | HQTT 95 | | 198 | | | | | | | | | | | |
| | 10.4m: CLAY with minor silt; light greyish brown with trace iron staining. Firm, moist, moderate to high plasticity | | | SPT 100 | 1/2 1/2 3/2 N=8 | 10.5 | | | | | | | | | | | |
| | 10.95m: Fine to medium SAND with trace silt; light greyish brown with minor iron staining. Loose, moist to wet | | | HQTT 90 | | 11.0 | | | | | | | | | | | |
| | 11.62m: Clayey SILT; light greyish brown. Firm, moist, moderate to high plasticity | | | | | 11.5 | | | | | | | | | | | |
| | 11.77m: Silty fine to medium SAND with trace clay. Light greyish brown with minor iron staining. Loose, moist to wet | | | SPT 100 | 2/2 1/1 1/2 N=5 | 12.0 | | | | | | | | | | | |
| | 12.45m: No recovery (core loss) | | | | | 12.5 | | | | | | | | | | | |
| | 12.95m: Fine to coarse SAND; light greyish brown. Loose, moist to wet | | | HQTT 57 | | 13.0 | | | | | | | | | | | |
| | 13.0m: Fine to medium SAND with some gravel and minor silt; light greyish brown with some iron staining. Loose, moist to wet. Gravel, fine-medium, sub rounded to sub angular | | | | | 13.5 | | | | | | | | | | | |
| | 13.35m: Fine to medium SAND with minor silt; light brown with orange mottling. Medium dense, moist to wet | | | SPT 100 | 0/1 1/2 2/8 N=13 | 14.0 | | | | | | | | | | | |
| | 13.95m: CLAY with some gravel. Light brown. Firm, moist, moderate plasticity. Gravel, fine to medium grained, sub angular | | | | | 14.5 | | | | | | | | | | | |
| MW Pakiri | 14.05m: Moderately weathered, grey stained orange brown, fine to medium SANDSTONE. Weak | | | HQTT 100 | | 194 | | | | | | 14.16m: J, 15° dip, UN, SL, W, VN-N, CN 14.30m: J, 15° dip, UN, SL, W, VN-N, FeSt | | | | | |
| SW-MW Pakiri | 14.5m: Slightly weathered, grey with minor zones of brown staining and orange brown stained defects, fine to medium SANDSTONE. Weak 14.80 - 14.85m: brown | | | | | 195 | | | | | | 14.65m: J, 15° dip, UN, R, W, VN-N, CN 14.73m: J, 10, PL, R, N, FeSt 14.78m: J, 30° dip, UN, SM, W, N, FeSt 14.80m: J, 10° dip, UN, SM, W, N, FeSt | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 3, 9.7-14.0m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 4 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|--|--|-----------------|-------------------|---------|--------|-----------|-------------------------|--|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| SW-MW Pakiri | 14.5m [Cont'd]: Slightly weathered, grey with minor zones of brown staining and orange brown stained defects, fine to medium SANDSTONE. Weak | | UW MW CW US MS EW | S MS EW | HQTT | 96 | | 193 | 15.5 | [Yellow dotted pattern] | 2000 600 400 200 100 50 20 | 63 | 15.26m: J, 20° dip, UN, SM, W, N, FeSt | 25 50 75 | | | | | |
| | 15.95m: Slightly weathered, grey, SILTSTONE. Weak. | | | | | | | | | | | | 15.55 - 15.60m: BZ | | | | | | 15.66m: J, 60° dip, UN, SM, W, N, FeSt |
| | 16.03m: Slightly weathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | | | | | 15.82m: J, 10° dip, UN, SL, W, N, CN | | | | | | 15.98m: J, 15° dip, UN, R, W, N, CN |
| | | | | | | | | | | | | | 16.05 - 16.25m: BZ | | | | | | 16.25m: J, 25° dip, PL, R, W, N-MN, FeSt |
| | | | 16.30m: J, 15° dip, PL, R, W, N, FeSt | 16.70m: J, 15° dip, PL, R, W, N, CN | | | | | | | | | | | | | | | |
| | | | 16.75m: J, 35° dip, PL, R, W, N, FeSt | 16.94m: J, 20° dip, PL, SM, W, N-MN, CV | | | | | | | | | | | | | | | |
| | | | 16.94m: J, 20° dip, PL, SM, W, N-MN, CV | 17.07m: J, 10° dip, UN, SM, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 17.07m: J, 10° dip, UN, SM, W, N, FeSt | 17.10m: J, 15° dip, UN, SM, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 17.10m: J, 15° dip, UN, SM, W, N, FeSt | 17.22m: J, 85° dip, UN, R, W, N, CN | | | | | | | | | | | | | | | |
| | | | 17.22m: J, 85° dip, UN, R, W, N, CN | 17.40m: J, 10° dip, UN, R, W, N, CN | | | | | | | | | | | | | | | |
| | | | 17.40m: J, 10° dip, UN, R, W, N, CN | 17.43 - 17.88m: J, 90° dip, UN, R, W, N-MN, CG | | | | | | | | | | | | | | | |
| | | | 17.43 - 17.88m: J, 90° dip, UN, R, W, N-MN, CG | 17.98m: J, 60° dip, UN, SM, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 17.98m: J, 60° dip, UN, SM, W, N, FeSt | 18.00m: J, 60° dip, PL, R, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 18.00m: J, 60° dip, PL, R, W, N, FeSt | 18.18m: J, 55° dip, PL, R, W, VN-N, FeSt | | | | | | | | | | | | | | | |
| | | | 18.18m: J, 55° dip, PL, R, W, VN-N, FeSt | 18.32m: J, 70° dip, UN, SM, W, N, CN | | | | | | | | | | | | | | | |
| | | | 18.32m: J, 70° dip, UN, SM, W, N, CN | 18.66m: J, 15° dip, UN, SM, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 18.66m: J, 15° dip, UN, SM, W, N, FeSt | 18.71m: J, 20° dip, UN, ST, W, N, FeSt | | | | | | | | | | | | | | | |
| | | | 18.71m: J, 20° dip, UN, ST, W, N, FeSt | 19.00m: [Yellow dotted pattern] | | | | | | | | | | | | | | | |
| | | | 19.00m: [Yellow dotted pattern] | 19.90m: J, 15° dip, UN, R, W-MS, N, FeSt | | | | | | | | | | | | | | | |
| | | | 19.90m: J, 15° dip, UN, R, W-MS, N, FeSt | 19.92m: J, 25° dip, UN, R, W-MS, N, FeSt | | | | | | | | | | | | | | | |
| | | | 19.92m: J, 25° dip, UN, R, W-MS, N, FeSt | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 4, 14.0-16.7m

Box 5, 16.7-19.3m

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 5 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|-----------|-----------|-------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| SW-MW Pakiri | 18.2m [Cont'd]: Slightly weathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | [Pattern] | [Pattern] | HQTT | 100 | | 188 | 20.5 | [Pattern] | 2000 | 99 | | | 25 | | | | |
| | 21.0 | 21.5 | | | | | | [Pattern] | 600 | 100 | | | | | | | | | |
| | 22.0 | 22.5 | | | | | | [Pattern] | 200 | 100 | | | | | | | | | |
| SW-MW Pakiri | 22.7m: Grades to fine to coarse SANDSTONE | | [Pattern] | [Pattern] | HQTT | 100 | | 186 | 23.0 | [Pattern] | 200 | 100 | | 25 | | | | | |
| | 23.5 | 24.0 | | | | | | [Pattern] | 600 | 100 | | | | | | | | | |
| | 24.5 | 24.8 | | | | | | [Pattern] | 200 | 90 | | | | | | | | | |
| SW-MW Pakiri | | | [Pattern] | [Pattern] | HQTT | 100 | | 184 | 24.5 | [Pattern] | 200 | 90 | 24.48m: J, 40° dip, PL, R, W-MS, N, FeSt | 25 | | | | | |
| | 24.67 - 25.00m: J, 85° dip, UN, SM, W-MS, T, CN | | | | | | | | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 6, 19.3-22.1m

Box 7, 22.1-24.5m

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 6 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|--|--|-----------------|-------------------|---------|--------|-----------|-------------------------|---------------------------------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|------|-------------------------|----|--|-----|------|-------------------------|----|---|-----|------|-------------------------|----|--|-----|------|-------------------------|--|---|-----|------|-------------------------|--|-----|------|-------------------------|--|-----|------|-------------------------|--|-----|------|-------------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW-MW Pakiri | 22.7m: [Cont'd]: Slightly weathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW MW CW US MS CS US MS CS US MS CS US MS CS | US MS CS US MS CS US MS CS US MS CS US MS CS | HQTT | 100 | | 183 | 25.5 | [Yellow dotted pattern] | 2000 600 200 100 50 20 | 90 | 25.03m: J, 15° dip, UN, R, W-MS, N, FeSt 25.05m: J, 15° dip, UN, R, W-MS, N, FeSt 25.24m: J, 20° dip, UN, SM, W-MS, N, FeSt 25.30 - 25.38m: BZ | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25.24m: Moderately weathered, brown, fine coarse SANDSTONE. Weak | | | | | | | | | | | | | | | | | | 182 | 26.0 | [Yellow dotted pattern] | 82 | 25.64m: J, 35° dip, UN, R, W-MS, N, FeSt 25.78m: J, 10° dip, UN, R, W-MS, N, FeSt 25.88m: J, 20° dip, UN, R, W-MS, N, FeSt 25.98m: J, 30° dip, UN, R, W-MS, N, FeSt 26.03m: J, 10° dip, UN, R, W-MS, N, CN 26.14m: J 26.24m: 26.37m: J, 35° dip, UN, SM, W-MS, N, CN 26.38m: J, 35° dip, UN, SM, W-MS, N, CN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25.5m: Slightly weathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | 181 | 26.5 | [Yellow dotted pattern] | 72 | 27.40m: J, 15° dip, UN, SM, W-MS, N, CN 27.43m: J, 15° dip, UN, SM, W-MS, N, CN 27.63 - 27.69m: BZ 27.75m: J, 25° dip, UN, SM, W-MS, N, CN 27.90m: J, 20° dip, UN, R, W-MS, N, CN 27.93m: J, 20° dip, UN, R, W-MS, N, FeSt 28.05m: J, 60° dip, UN, R, W-MS, N, FeSt 28.18m: J, 10° dip, UN, R, W-MS, N, FeSt | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 27.62m: Slightly weathered, grey, SILTSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | 180 | 27.0 | [Yellow dotted pattern] | 44 | 28.44m: J, 20° dip, UN, R, W-MS, N, FeSt 28.60m: J, 15° dip, UN, SM, W-MS, N, CN 28.62 - 28.68m: BZ 28.76m: J, 40° dip, UN, SM, W-MS, N, CN | | | | | | | | | | | | | | | | | | | | | |
| | 27.68m: Slightly weathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 179 | 28.5 | [Yellow dotted pattern] | | 29.13m: J, 25° dip, UN, PL, W-MS, N, CN 29.23m: J, 35° dip, UN, R, W-MS, N, FeSt 29.25m: J, 20° dip, UN, SM, W-MS, N, CN 29.31m: J, 25° dip, UN, SM, W-MS, N, CN 29.37m: J, 15, UN, SM, N, CN 29.43m: J, 20° dip, UN, SM, W-MS, N, CN 29.52m: J, 15, PL, SM, N, CN 29.58 - 29.61m: BZ 29.68m: J, 25° dip, UN, SM, W-MS, N, CV 29.80 - 29.85m: BZ | | | | | | | | | | | | | | | | |
| | 28.1m-28.3m: Moderately weathered, grey with brown staining, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 179 | 29.0 | [Yellow dotted pattern] | | | | | | | | | | | | | |
| | 28.6m: Interbedded, slightly weathered, grey SILTSTONE and fine SANDSTONE. Weak. Thin to moderately thin beds. Shallow dipping bedding planes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 179 | 29.5 | [Yellow dotted pattern] | | | | | | | | | |
| | 28.9m-29.05m: brown and orange brown staining | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 179 | 29.5 | [Yellow dotted pattern] | | | | | |
| | 29.9m-30.0m: brown | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 179 | 29.5 | [Yellow dotted pattern] | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 8, 24.5-27.2m

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 7 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation |
| SW-MW Pakiri | 28.6m [Cont'd]: Interbedded, slightly weathered, grey SILTSTONE and fine SANDSTONE. Weak to moderately strong. Thin to moderately thin beds. Shallow dipping bedding planes | | UW | MS | HQTT | 100 | | 178 | 30.5 | | 2000 600 200 100 50 20 | 25 | 30.10m: J, 30° dip, PL, R, W-MS, N, FeSt 30.18 - 30.24m: BZ 30.31 - 30.40m: BZ 30.44m: J, 20° dip, UN, R, W-MS, N, CN 30.52m: J, 20° dip, UN, SM, W-MS, N, CN 30.58 - 30.62m: BZ 30.68m: J, 35° dip, UN, SM, W-MS, N, CN 30.73 - 30.89m: BZ 30.92m: J, 15° dip, PL, R, W-MS, N, CN 31.01m: J, 15° dip, UN, SM, W-MS, N, CN 31.04m: J, 15° dip, UN, SM, W-MS, N, CN 31.09m: J, 15° dip, UN, SM, W-MS, N, CN | | | | | |
| UW Pakiri | 31.4m: Unweathered, interbedded, grey SILTSTONE and fine SANDSTONE. Weak to moderately strong. Bedding is thin to moderately thick | | | | HQTT | 100 | | 177 | 31.5 | | | 96 | 31.60m: J, 15° dip, UN, SM, W-MS, N, CN 31.93m: J, 30° dip, UN, R, W-MS, N, CN 31.97m: J, 10° dip, UN, SM, W-MS, N, CN | | | | | |
| | 33.08m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | HQTT | 100 | | 176 | 32.0 | | | 86 | 32.79m: J, 20° dip, UN, SM, W-MS, N, CN 32.83m: J, 20° dip, PL, R, W-MS, N, CN 33.08m: J, 30° dip, UN, SM, W-MS, N, CN | | | | | |
| | 33.77m: Unweathered, grey, SILTSTONE. Weak to moderately strong | | | | HQTT | 100 | | 175 | 33.5 | | | 100 | 33.76m: J, 5° dip, UN, SM, W-MS, N, CN 33.81m: J, 5° dip, UN, R, W-MS, N, CN | | | | | |
| | 33.84m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | 174 | 34.0 | | | | 34.31m: J, 15° dip, UN, R, W-MS, N, CN 34.33m: J, 10° dip, UN, R, W-MS, N, CN | | | | | |
| | 34.6m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | 34.5 | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 10, 30.1-33.0m

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 8 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------------|--------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 34.6m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 173 | 35.5 | | 2000 | 100 | 35.24m: J, 20° dip, PL, R, W-MS, VN- N, CN | 25 | | | | Box 11, 33.0-35.9m | |
| | 36.1m: Interbedded, unweathered, grey SILTSTONE and fine SANDSTONE. Weak to moderately strong. Thin to moderately thin beds. Shallow dipping bedding planes. | | UW | MS | HQTT | 100 | | 172 | 36.5 | | 600 | 98 | 36.51m: J, 10° dip, UN, SM, W-MS, N, CV 36.53m: J, 10° dip, UN, SM, W-MS, N, CV | 50 | | | | | |
| | 37.15m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 171 | 37.5 | | 400 | 100 | | 75 | | | | | |
| | 37.65m: Interbedded, unweathered, grey SILTSTONE and fine to coarse SANDSTONE. Weak to moderately strong. Thin to moderately thin beds. Shallow dipping bedding planes. | | UW | MS | HQTT | 100 | | 170 | 38.5 | | 200 | 100 | | | | | | | |
| | 39.53m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 169 | 39.5 | | 20 | 100 | | | | | | | Box 12, 35.9-38.7m |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 9 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | ROCK DEFECTS | | | | | | | | | | | | |
|-----------------|---------------------|---------------|-----------------|-------------------|--------------|--------|-----------|-------------------------|------------|-----------------------|---------|---|----------------|-------------|--------|--------------|-------------|
| | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | UW | MS | HQTT | 100 | | 168 | 39.53m | [Yellow dotted pattern] | | | 100 | 39.53m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | |
| | UW | MS | HQTT | 100 | | 167 | 41.5m | [Yellow dotted pattern] | | | 100 | 41.5m: Interbedded, unweathered, grey SILTSTONE and fine to coarse SANDSTONE. Weak to moderately thin beds. Shallow dipping bedding planes. | | | | | |
| | UW | MS | HQTT | 100 | | 166 | 42.0m | [Yellow dotted pattern] | | | 100 | 42.0m: Interbedded, unweathered, grey SILTSTONE and fine to coarse SANDSTONE. Weak to moderately thin beds. Shallow dipping bedding planes. | | | | | |
| | UW | MS | HQTT | 100 | | 165 | 43.4m | [Yellow dotted pattern] | | | 84 | 43.4m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | |
| | | | | | | 164 | 44.5m | [Yellow dotted pattern] | | | 100 | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH8

SHEET: 10 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 24/04/2018

FINISH DATE: 30/04/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978251.58 mN
 (NZTM2000) 1742801.78 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 208.20m
 R.L. COLLAR: 208.20m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|--|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 43.4m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 163 | 43.4 | | | | | 45.35m: J, 70° dip, UN, R, W-MS, N, SC | | | | | | |
| | 46.4m: Unweathered, grey CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. Weak to moderately strong | | UW | MS | HQTT | 100 | | 162 | 46.4 | | | | | | | | | | | |
| | 46.9m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 161 | 46.9 | | | | | | | | | | | |
| | 47.56m: Unweathered, grey CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse sand matrix. Matrix supported. Weak to moderately strong | | UW | MS | HQTT | 100 | | 160 | 47.56 | | | | | | | | | | | |
| | 49.2m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 159 | 49.2 | | | | | | | | | | | |
| | 49.5m: END OF BOREHOLE | | UW | MS | | | | 159 | 49.5 | | | | | | | | | | | |

COMMENTS: 65mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BH9 Log

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 1 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering <small>UW MW SW CW US OS LS LSW EW</small> | Rock Strength | Sampling Method Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) <small>25 50 75</small> | Water Level | Casing | Installation | Core Box No | |
|-----------------|--|---|---------------|--------------------------------------|---------|---------------------------|---------------------------------------|-------------|--|-----------------------|---------|--|---|-------------|--------|--------------|-------------|--|
| | | | | | | | | | Defect Log <small>2000 600 400 200 100 20</small> | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Fill | 0.0m: SILT, with some gravel, some rootlets; brown. Firm, wet, low plasticity | | | | | | | | | | | | | | | | | |
| Residual Soil | 0.15m: Silty CLAY; light orange brown mottled dark orange brown. Stiff, moist, moderate plasticity 0.25m: pink mottling appears. | | | | | | 240 | | | | | | | | | | | |
| | 0.55m: Clayey SILT; brownish pink with light grey streaks. Firm to stiff, moist to wet, low to moderate plasticity | | | HQTT | 86 | | 240 | | | | | | | | | | | |
| | 0.75m: SILT, with minor clay and trace fine sand; brownish pink with trace black streaks. Firm to stiff, moist to wet, high plasticity 0.96m: becomes trace clay, with some black carbonaceous streaks. | | | | SPT | 100 | 79/37 kPa 0/1 1/1 1/1 N=4 | 239 | | | | | | | | | | |
| Residual Soil | 2.80m: becomes greyish brown with some black streaks. | | | HQTT | 85 | | 238 | | | | | | | | | | | |
| | | | | PT | 40 | 92/11 kPa | 3.0 | | | | | | | | | | | |
| | | | | SPT | 100 | 1/1 3/3 4/4 N=14 | 237 | | | | | | | | | | | |
| CW Pakiri | 3.95m: Silty CLAY; light brown. Firm to stiff, moist to wet, moderate plasticity | | | HQTT | 63 | | 236 | | | | | | | | | | | |
| | 4.0m: Fine to medium SAND, some silt; brown, with black streaks. Medium dense, wet | | | SPT | 100 | 2/4 5/5 6/7 N=23 | 236 | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-4.0m

96mm HWT

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 2 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---|--------|-----------|-------------|--------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| CW Pakiri | 5.0m: Fine to medium SAND, with some silt; brown with black streaks. Medium dense, wet | | UW | US | HQTT | 80 | | 235 | 5.5 | | | | | | | | | | |
| | 6.00m: Becomes dense | | UW | US | SPT | 100 | 2/4 6/5 11/16 N=38 | 234 | 6.0 | | | | | | | | | | |
| | 6.55m: Fine to medium SAND, minor silt; light brown to brown mottled orange brown. Dense, moist | | UW | US | HQTT | 100 | | 234 | 6.5 | | | | | | | | | | |
| HW Pakiri | 7.1m: Sandy SILT; light brown. Very stiff, moist, low plasticity; Sand is fine | | UW | US | | | | | 7.0 | | | | | | | | | | |
| | 7.22m: Fine to medium SAND, trace silt; brown. Dense, moist | | UW | US | | | | | 7.5 | | | | | | | | | | |
| | 7.4m: Highly weathered to completely weathered, brown, fine to medium SANDSTONE. Extremely weak [Fine to medium SAND; brown. Very dense, moist] | | UW | US | SPT | 0 | 5/19 50 for 75mm N>=50 Solid | 233 | 7.5 | | | | 7.50m: Solid cone SPT used | | | | | | |
| SW-MW Pakiri | 7.8m: Highly weathered, brown-grey, fine to medium SANDSTONE. Extremely weak to weak | | UW | US | HQTT | 87 | | 232 | 8.0 | | | | | | | | | | |
| | 8.5m: Slightly weathered to moderately weathered, grey with bands of brown staining, fine to coarse grained SANDSTONE. Weak | | UW | US | | | | | 8.5 | | | | 8.25 - 8.50m: J, 10° dip, PL, SM, W, N, CN, extremely closely spaced | | | | | | |
| | 8.75m: becomes brown. | | UW | US | | | | | 9.0 | | | | 8.65 - 8.69m: J, 20° dip, UN, SM, W, N, CN, extremely closely spaced | | | | | | |
| HW Pakiri | 9.8m: Highly weathered to moderately weathered, brown, fine SANDSTONE. Weak to very weak | | UW | US | HQTT | 100 | | 231 | 9.5 | | | | 8.77 - 9.00m: J, 10-15°, PL, SM, W, N, CN, extremely closely spaced | | | | | | |
| | | | UW | US | | | | | 9.82 | | | | 9.82 - 9.92m: J, 15-20°, UN, SM, W, VN, CN, extremely closely spaced | | | | | | |
| | | | UW | US | | | | | 9.92 | | | | 9.92 - 10.30m: Broken zone | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 2, 4.0-7.9m

96mm HWT



BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 3 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| HW Pakiri | 9.8m [Cont'd]: Highly weathered to moderately weathered, brown, fine SANDSTONE. Weak to very weak | | UW | MS | HQTT | 100 | | | | | | | | | | | | | |
| SW-MW Pakiri | 10.3m: Slightly weathered, grey SILTSTONE. Weak | | UW | MS | HQTT | 100 | | 230 | 10.5 | | | | 53 | 10.35m: J, 10, UN, SM, VN, CN 10.43m: J, 15, UN, SM, VN, CN 10.48m: J, 10, UN, SM, VN, CN 10.52m: J, 10, UN, SM, VN, CN 10.57m: J, 10, UN, SM, VN, CN 10.82m: J, Orthog 50°, UN, SL, W, VN, FeSt & 40°, UN, SL, W, VN, FeSt 10.85 - 10.88m: BZ | | | | | |
| | 10.95m: Moderately weathered, light brown with minor lenses of grey, fine SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 229 | 11.0 | | | | 38 | 10.88 - 11.01m: J, 0-10°, UN, SL - ST, SM, W, T-VN, FeSt 11.10 - 11.14m: J, 10° dip, PL, R - UN, SM, T-VN, FeSt, black St 11.19m: J, 30° dip, UN, R, W, VN, FeSt, with black/grey st 11.30m: J, 40° dip, UN, R, W, VN, grey/black staining 11.31m: J, 30° dip, UN, R, W, VN, CN 11.39m: J, 30° dip, UN, R-SM, W, T-VN, black staining 11.55m: J, 60° dip, UN, R, W, VN, black staining 11.65m: J, 20° dip, UN, SM, W, VN, black staining 11.69m: J, 50° dip, UN, R, W, VN, black staining 11.78m: B, 10° dip, UN, SM, W, VN, CN 12.15m: J, 40° dip, UN, R, W, VN, black staining 12.24 - 12.28m: J, 60° dip, VCS, UN, SM, VN, minor black st 12.39m: DD 12.55m: J, 20° dip, UN, R, W, VN, CN | | | | | |
| | 11.80 - 11.90m: Grey | | UW | MS | HQTT | 100 | | 228 | 12.0 | | | | 66 | 12.70 - 12.80m: J, 20-40°, UN, R, W, VN, very closely spaced 12.80m: J, 5° dip, UN, SM, W, VN, black st 12.96m: J, 55° dip, UN, R, W, VN, black st & orthog 70°, UN, SM, W, VN, black st 13.01m: J, 85° dip, UN, SM, VN, CN 13.05m: J, 60° dip, UN, R, W, VN, black staining 13.05 - 13.50m: J, 90° dip, UN, SM, W, VN, black staining, very closely spaced | | | | | |
| | 12.20 - 12.50m: Grey | | UW | MS | HQTT | 100 | | 227 | 12.5 | | | | 96 | 12.80m: J, 20-40°, UN, R, W, VN, very closely spaced 12.80m: J, 5° dip, UN, SM, W, VN, black st 12.96m: J, 55° dip, UN, R, W, VN, black st & orthog 70°, UN, SM, W, VN, black st 13.01m: J, 85° dip, UN, SM, VN, CN 13.05m: J, 60° dip, UN, R, W, VN, black staining 13.05 - 13.50m: J, 90° dip, UN, SM, W, VN, black staining, very closely spaced | | | | | |
| UW-SW Pakiri | 12.3m: Moderately weathered, brown, fine to coarse SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 226 | 13.5 | | | | 96 | 12.70 - 12.80m: J, 20-40°, UN, R, W, VN, very closely spaced 12.80m: J, 5° dip, UN, SM, W, VN, black st 12.96m: J, 55° dip, UN, R, W, VN, black st & orthog 70°, UN, SM, W, VN, black st 13.01m: J, 85° dip, UN, SM, VN, CN 13.05m: J, 60° dip, UN, R, W, VN, black staining 13.05 - 13.50m: J, 90° dip, UN, SM, W, VN, black staining, very closely spaced | | | | | |
| | 13.5m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 226 | 14.0 | | | | 96 | 13.90m: J, 30° dip, UN, R, VW-MS, T-VN, CN 14.25m: B, 5° dip, UN, SM, W-MS, VN-N, CN 14.30m: B, 5° dip, ST, SM, W-MS, N-MN, CN 14.35m: J, 10° dip, UN, SM, W-MS, N-MN, CN 14.48m: J, 10° dip, PL, R, W-MS, T-VN 14.68m: J, 10° dip, UN, SL, W-MS, VN-N, CN | | | | | |
| | 14.25m: Unweathered grey SILTSTONE, interbedded with some very thin to thin beds of fine SANDSTONE. Weak to moderately strong, shallow dipping bedding planes | | UW | MS | HQTT | 100 | | 226 | 14.5 | | | | 96 | 14.25m: B, 5° dip, UN, SM, W-MS, VN-N, CN 14.30m: B, 5° dip, ST, SM, W-MS, N-MN, CN 14.35m: J, 10° dip, UN, SM, W-MS, N-MN, CN 14.48m: J, 10° dip, PL, R, W-MS, T-VN 14.68m: J, 10° dip, UN, SL, W-MS, VN-N, CN | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m
Scale 1:25



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 4 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
(NZTM2000) 1742573.68 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
R.L. COLLAR: 240.50m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | |
| UW-SW Pakiri | 15.0m: Unweathered, grey SILTSTONE and fine SANDSTONE. Weak to moderately strong. Bedding is very thin to moderately thin, shallow dipping bedding planes | | UW | MS | HQTT | 100 | | 225 | 15.5 | | 2000 600 200 100 50 20 | 69 | 15.16m: J, 10° dip, UN, SM, W-MS, VN-N, CN 15.24m: J, 10° dip, UN, SL, W-MS, N, CV 15.35m: J, 5° dip, UN, SL, W-MS, N, CV 15.40 - 15.42m: Broken zone 15.61m: J, 5° dip, UN, SL, W-MS, T-VN, CV 15.73m: J, 10° dip, PL, SM, W-MS, T-VN, CN 15.84m: J, 10° dip, UN, SM, W-MS, VN, CN 15.94m: J, 10° dip, UN, SM, W-MS, N, CN 16.00m: J, 25° dip, ST, R, W-MS, N, CN | | | | | | |
| | 16.6m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 224 | 16.5 | | | 99 | 17.16m: J, 10° dip, UN, SM, W-MS, N, CN 17.24m: J, 25° dip, UN, R, W-MS, N, CN | | | | | | |
| | 18.15m: Becomes slightly weathered, brown fine to medium SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 223 | 17.5 | | | 100 | 18.25 - 18.58m: J, 80° dip, UN, R, W-MS, N, CN | | | | | | |
| | 18.9m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 222 | 18.5 | | | 100 | 18.67m: J, 10° dip, UN, SM, W-MS, N, CN 18.74m: J, 40° dip, UN, SM, W-MS, N, CN, with minor black staining | | | | | | |
| UW Pakiri | 19.5m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 221 | 19.5 | | | 100 | | | | | | | |

Box 5, 13.5-16.2m

Box 6, 16.2-19.3m

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m
Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 5 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | |
| SW Pakiri | 16.6m [Cont'd]: Unweathered to slightly weathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 240.5 | | | | | | | | | | | |
| UW Pakiri | 20.3m: Unweathered, grey, SILTSTONE, interbedded with some very thin to thin beds of fine to coarse SANDSTONE. Weak to moderately strong, shallow dipping bedding 20.7m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 220 | 20.5 | | | | | | | | | | |
| | | | | | | | | 210 | 21.0 | | | | | | | | | | |
| | | | | | | | | 215 | 21.5 | | | | | | | | | | |
| | | | | | | | | 220 | 22.0 | | | | | | | | | | |
| | | | | | | | | 225 | 22.5 | | | | | | | | | | |
| | | | | | | | | 230 | 23.0 | | | | | | | | | | |
| | | | | | | | | 235 | 23.5 | | | | | | | | | | |
| | | | | | | | | 240 | 24.0 | | | | | | | | | | |
| | | | | | | | | 245 | 24.5 | | | | | | | | | | |
| | | | | | | | | 249.8 | 24.98 | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 6 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 23.7m [Cont'd]: Unweathered, grey SILTSTONE, interbedded with some thin to moderately thin beds of fine to medium SANDSTONE. Weak to moderately strong, shallow dipping beds. | | UW | MS | HQTT | 100 | | 215 | 25.5 | | 2000 | 97 | 25.38m: J, 10° dip, UN, R, W-MS, VN-N, CN 25.42m: J, 10° dip, PL, R, W-MS, VN-N, CN | | | | | | |
| | 25.6m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 214 | 26.0 | | 600 | 100 | | | | | | | |
| | | | UW | MS | HQTT | 100 | | 213 | 27.0 | | 400 | 100 | 27.30m: J, 75° dip, PL, R, W-MS, N, CN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 212 | 28.0 | | 200 | 100 | 28.80m: J, 20° dip, UN, SM, W-MS, VN-N, CN | | | | | | |
| | | | UW | MS | HQTT | 100 | | 211 | 28.5 | | 200 | 100 | 29.10m: J, 15° dip, UN, SM, W-MS, VN-N, CN | | | | | | |
| | | | | | | | | | 29.0 | | | | | | | | | | |

Lugeon @ 25.5m

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 9, 24.6-27.1m

Box 10, 27.1-30.0m

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 7 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|--|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 25.6m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 210 | 30.5 | | 2000 | 100 | 30.45m: J, 20° dip, UN, R, W-MS, VN-N, CN | | | | | | |
| | 30.30m: with minor gravel size clasts of SILTSTONE. Clasts are fine to medium gravel, sub-angular to sub-rounded | | | | | | | 31.0 | | | | | | | | | | | |
| | 30.9m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 31.00m: becomes fine to medium grained. | | | | | | | 209 | 31.5 | | | | | 31.90m: J, 15° dip, PL, R, W-MS, VN-N, CN | | | | | |
| | | | | | | | | 208 | 32.5 | | | | | 32.40m: J, 5° dip, UN, SM, W-MS, VN-N, CN | | | | | |
| | | | | | | | | | 32.0 | | | | | 32.73m: J, 5° dip, PL, R, W-MS, VN-N, CN | | | | | |
| | | | | | | | | | 33.0 | | | | | 33.06m: J, 45° dip, UN, SM, W-MS, N, CN 33.22m: J, 15° dip, UN, SM, W-MS, N, CN | | | | | |
| | | | | | | | | | 207 | 33.5 | | | | 33.60m: J, 15° dip, UN, SM, W-MS, VN-N, CN | | | | | |
| | | | | | | | | 34.0 | | | | | 34.00m: J, 10° dip, UN, SM, W-MS, VN-N, CN 34.20m: J, 30° dip, ST, SM, W-MS, VN-N, CN | | | | | | |
| | | | | | | | | 206 | 34.5 | | | | 34.63m: J, 30° dip, UN, SM, W-MS, VN-N, CN | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 8 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|-------------------------|--|---------|----------------|-------------|--------|--------------|--------------------|---------------------------------------|--|--|---|---|------|-----|------|---|------|-----|------|---|------|-----|------|---|------|-----|------|---|----------------|--|---|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | Description & Additional Observations | | | | | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 33.9m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW MS CN | MS | HQTT | 100 | | | 205 | 35.5 | [Yellow dotted pattern] | 2000 600 600 600 600 20 | 100 | | | | | Box 12, 32.8-35.6m | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 25 50 75 | | | 35.01m: J, 10° dip, PL, R, W-MS, VN-N, CN | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | 35.41m: J, 25° dip, UN, SM, W-MS, N, CN | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 36.0 | 204 | 36.5 | 36.28m: J, 15° dip, UN, SM, W-MS, N, CN | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 37.0 | 203 | 37.5 | 37.10m: J, 75° dip, UN, SM, W-MS, N, CN | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 38.0 | 202 | 38.5 | 37.98m: J, 10° dip, PL, R, W-MS, VN-N, CN | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.0 | 201 | 39.5 | 38.70m: J, 20° dip, UN, R, W-MS, VN-N, CN | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Lugeon @ 37.5m | 39.02m: J, 20° dip, UN, SL, W-MS, VN-N, CV | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 39.30m: J, 75° dip, PL, R, W-MS, VN-N, CN |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39.88m: fine to medium grained. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 9 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|---|---|-------------------------|--------------------------|---------|--------|-----------|-------------|---|---|--|---------------------------------------|----------------------------------|-------------|--------|--------------|--------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering UW MW SW CW | Rock Strength US MS SS ES VS WS EW | Sampling Method HQTT | Core Recovery (%) 100 | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log 2000 600 200 100 50 20 | Fracture Spacing (mm) | RQD (%) 97 100 100 100 | Description & Additional Observations | Fluid Loss (%) 25 50 75 | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 39.88m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | HQTT | 100 | | 200 | 40.5 | | | 97 | 40.16m: J, 20° dip, UN, SM, W-MS, VN-N, CN | | | | | | Box 14, 38.1-40.8m | |
| | 40.36m: fine to coarse grained. | | | | | | 41.0 | | | 100 | 40.95m: J, 5° dip, UN, SM, W-MS, N, CN (potentially drilling induced) | | | | | | | | |
| | 40.85m: Unweathered, interbedded grey SILTSTONE and grey, fine to coarse SANDSTONE. Weak to moderately strong, thin to moderately thin bedding, shallow dipping beds | | | HQTT | 100 | | 199 | 41.5 | | | 100 | 41.45m: DD, (Lot of fractures induced here from breaking into splits. All joints logged before breaking) | | | | | | | |
| | 42.44m: Unweathered, grey, fine to coarse SANDSTONE, with minor fine to medium gravel size clasts of SILTSTONE. Weak to moderately strong | | | HQTT | 100 | | 198 | 42.5 | | | 100 | | | | | | | | |
| | 43.25m: Unweathered, interbedded grey SILTSTONE and grey, fine to coarse SANDSTONE. Weak to moderately strong, thin to moderately thin bedding, shallow dipping beds | | | | | | 197 | 43.5 | | | 100 | 43.25m: J, 45° dip, UN, SL, W-MS, VN-N, CV | | | | | | | |
| | | | | | | | 44.0 | | | 100 | 43.84m: J, 10° dip, UN, SM, W-MS, VN-N, CN | | | | | | | Box 15, 40.8-43.7m | |
| | | | | | | | 44.5 | | | 100 | 44.16m: J, 35° dip, UN, SL, W-MS, VN-N, CN | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH9

SHEET: 10 OF 10

DRILLED BY: Lei

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/04/2018

FINISH DATE: 20/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Wayby Valley

CO-ORDINATES: 5978793.64 mN
 (NZTM2000) 1742573.68 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 240.50m
 R.L. COLLAR: 240.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 43.25m [Cont'd]: Unweathered, interbedded grey SILTSTONE and grey, fine to coarse SANDSTONE. Weak to moderately strong, thin to moderately thin bedding, shallow dipping beds | | UW | MS | HQTT | 100 | | 195 | 45.5 | | 2000 | 100 | 45.18m: J, 10° dip, UN, SM, W-MS, N, CN | | | | | | | |
| | 45.33m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 194 | 46.0 | | 600 | 100 | 46.02m: J, 60° dip, PL, R, W-MS, N, CN | | | | | | | |
| | 46.88m: with minor fine to medium gravel size clasts of SILTSTONE. Clasts are sub-angular to sub-rounded | | UW | MS | HQTT | 100 | | 193 | 47.0 | | 400 | 100 | | | | | | | | |
| | 47.3m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 192 | 47.5 | | 200 | 100 | | | | | | | | |
| | 49.5m: END OF BOREHOLE | | UW | MS | | | 191 | 48.0 | | | | | 49.00m: J, 80° dip, UN, R, W-MS, N, CN | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear Vane No. 2204. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BH10 Log

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 1 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|--------------------------------------|--------|-----------|-------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| Residual Soil | 0.0m: | Silty fine SAND; brown minor black streaks and reddish brown and yellowish brown mottles. Loose, wet | | | | | | 183 | 0.5 | | | | | | | | | |
| | 1.0m: | Sandy SILT; reddish brown, minor yellow brown and black streaks. Stiff to very stiff, wet, low plasticity. Sand is fine to medium | | | HQTT | 66 | | | 1.0 | | | | | | | | | |
| | 1.0m: | No Recovery (core loss) | | | | | 104/28 kPa | | 1.5 | | | | | | | | | |
| | 1.5m-2.0m: | Push Tube | | | PT | 100 | | | 2.0 | | | | | | | | | |
| | 2.0m: | Silty fine to medium SAND, trace fine gravel size pockets of whitish grey silt, minor reddish brown sandy SILT laminae from 2.35m; reddish pink. Loose, wet | | | SPT | 88 | 1/0 1/1 1/1 N=4 | | 2.5 | | | | | | | | | |
| | 2.4m: | No Recovery (core loss) | | | | | | | 2.5 | | | | | | | | | |
| | 2.45m: | Sandy SILT; reddish brown and pink; minor black and light brownish grey mottles. Firm, saturated, low plasticity. Sand is fine to medium | | | HQTT | 100 | | | 3.0 | | | | | | | | | |
| | 3.0m-3.5m: | Push Tube | | | PT | 100 | | | 3.5 | | | | | | | | | |
| | 3.5m: | Sandy SILT; pinkish brown. Stiff, wet, low plasticity. Sand is fine. | | | SPT | 100 | 1/1 1/2 2/2 N=7 | | 4.0 | | | | | | | | | |
| | 3.7m: | Fine SAND, minor silt; pinkish brown, minor black streaks. Loose, wet | | | | | | | 4.5 | | | | | | | | | |
| | 3.95m: | Sandy SILT; pinkish brown, black and light brown streaks from 4.1m to 4.25m. Stiff, wet, low plasticity. Sand is fine | | | HQTT | 100 | | | 4.5 | | | | | | | | | |
| | 4.5m: | Silty fine SAND; pinkish brown, some narrow to very narrow black streaks. Loose, wet | | | SPT | 100 | 24/6 kPa 1/1 1/2 2/3 N=8 | | 4.8 | | | | | | | | | |
| 4.8m: | Fine SAND, trace silt; light brown, minor black streaks. Loose, moist | | | | | | | | | | | | | | | | | |

3.52m: Narrow (4mm), black carbonaceous laminae, striated

Box 1.0.0-4.3m

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A

General Log - 5/04/2019 11:16:48 a.m. - Produced with Core-GS by GeRoc

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 2 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|---|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Residual Soil | 5.0m: Fine SAND, trace to minor silt; light grey to light brown, minor black carbonaceous laminae and orange brown limonite staining. Medium dense, moist to wet | | | | HQTT | 100 | | 178 | 5.5 | | | | | | | | | | | |
| | 5.8m - 5.9m: Silty fine SAND | | | | | | | 6.0 | | | | | | | | | | | | |
| | 6.45m: No recovery (core loss) | | | | | | | 177 | 6.5 | | | | | | | | | | | |
| | 6.8m: Fine SAND, minor silt; grey and light brown. Medium dense, wet | | | | HQTT | 66 | | 176 | 7.0 | | | | | | | | | | | |
| CW Pakiri | 6.9m: Completely weathered, light brown, fine SANDSTONE. Extremely weak. Minor very narrow black carbonaceous streaks. [Fine SAND, trace silt; light brown, minor black streaks. Tightly packed, wet] | | | | | | | 7.5 | | | | | | 7.10m: J, 50° dip, ST, SM, VN, FeSt 7.20 - 7.25m: BZ, Rec fine sand and extremely weak f-c gvl 7.35m: J, 55° dip, PL, R, VN, FeSt 7.50m: J, 30° dip, PL, SM on VN black carbonaceous laminae, brown staining, striated | | | | | | |
| | 7.5m: No recovery (core loss) | | | | | | | 175 | 7.5 | | | | | | | | | | | |
| | 7.7m: Recovered as fine SAND; light brown | | | | | | | | 8.0 | | | | | 7.80m: J, 30° dip, UN, SL, VN, FeSt 7.85m: J, 10° dip, PL, R, VN, FeSt 8.00m: J, 60° dip, UN, R, VN, CN | | | | | | |
| | 7.8m: Completely weathered, light brown, fine to medium SANDSTONE. Extremely weak. Minor very narrow black carbonaceous streaks. [Fine SAND, trace silt; light brown, minor black streaks. Tightly packed, wet] | | | | HQTT | 86 | | | 8.5 | | | | | 8.10 - 8.30m: J, 10 to 70, UN, SM, FeSt, striated, to UN, R, T-VN, CN 8.40 - 8.42m: J, Upper contact, UN, SM, FeSt, lower contact, UN, SL, striated, open, brown fine sand, black CC 8.50 - 8.55m: BZ 8.70m: J, 70° dip, UN, R, VN, FeSt 8.80 - 8.85m: BZ, Rec f-c gvl, lower contact is on orthog 20-40, UN, SM to R, VN, FeSt 8.95 - 9.00m: BZ, Upper C, 30, UN, R, VN, FeSt 9.00 - 9.60m: J, VCS to ExCS, 0 to 50, UN, SM, VN, FeSt 9.10m: J, 30° dip, UN, SL, VN, FeSt, heavily striated 9.40m: J, Curved 90 to 60, UN, R, VN, FeSt | | | | | | |
| | 9.6m: Highly weathered, brown, fine to coarse SANDSTONE. Very weak | | | | | | | | 9.5 | | | | | 9.60 - 9.80m: BZ, Rec as f-c gvl, J ExCS, UN, SL to SM, black CC, heavily striated, some FeSt 9.95 - 10.00m: BZ, Rec coarse gravel, some fine sand | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 3 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
(NZTM2000) 1742247.40 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
R.L. COLLAR: 183.50m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|---|---|-------------|--------|--------------|-------------|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | |
| HW Pakiri | 10.0m: No recovery (core loss) | | UW | MS | HQTT | 66 | | | | | | | | | | | | | | | |
| | 10.5m: Highly weathered, brown, fine to coarse SANDSTONE. Very weak | | MS | MS | HQTT | 100 | | | 173 | 10.5 | | | | 10.60m: J, -30° dip, UN, R, VN, yellowish br FeSt 10.62m: J, 55° dip, UN, SM, VN, yellowish br FeSt 10.72m: J, 5° dip, UN, R, VN, FeSt 10.80m: J, 20° dip, UN, R, VN, dark reddish brown FeSt 10.90 - 11.15m: J, 70° dip, to 85, curved to 50 deg dip from 11.1m, VCS, UN, R, VN, FeSt 11.15m: J, 20° dip, UN, R, VN, dark reddish br FeSt 11.15 - 11.52m: J, VCS, 20 to 50, UN, R, VN FeSt, some black specs 11.52 - 11.62m: J, ExCS, 20 to 40, UN, SM to R, VN, FeSt 11.68m: J, 30° dip, UN, R, VN, FeSt & orthog 70, UN, R, VN, FeSt | | | | | | | |
| MW Pakiri | 11.95m: Moderately weathered, dark brown, fine to coarse SANDSTONE. Very weak to weak | | MS | MS | HQTT | 100 | | | 172 | 11.5 | | | | 11.72 - 11.75m: BZ, Rec sandy f -c gvl, lower contact 40, UN, SM, black st, FeSt 11.82 - 12.20m: J, VCS, 20-30 deg, UN, R, VN to N, FeSt, some infilled with brown sandy silt | | | | | | | |
| | 12.8m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | MS | MS | HQTT | 100 | | | 171 | 12.5 | | | | 12.30 - 12.45m: J, 20° dip, VCS, UN, SM to R, VN, FeSt, black specs 12.45 - 12.60m: J, 20° dip, ExCS, UN, SM to R, VN, FeSt, black specs, trace brown silt 12.68 - 12.80m: J, 20° dip, ExCS to VCS, UN, SM to R, VN, FeSt, black staining 12.92m: DD, 0° dip | | | | | | | |
| UW-SW Pakiri | 13.22m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine gravel size clasts in fine to coarse sand matrix. Matrix supported | | MS | MS | HQTT | 100 | | | 170 | 13.5 | | | | 13.50m: DD, 0° dip 13.53m: J, 40° dip, to 60, UN, R, VN, greenish brown staining | | | | | | | |
| | 13.4m to 13.9m: Conglomerate is fine to medium gravel size clasts in fine to coarse sand matrix. Matrix supported | | MS | MS | HQTT | 100 | | | | | | | | | | | | | | | |
| | 14.10 - 14.14m: Fine to coarse SANDSTONE, minor fine gravel size clasts | | MS | MS | HQTT | 100 | | | | | | | | | | | | | | | |
| | 14.08m: Unweathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts. Weak to moderately strong. | | MS | MS | HQTT | 100 | | | | | | | | | 14.10m: DD, 0° dip, to 10, hammer break 14.30m: DD, 0° dip | | | | | | |
| | 14.60 - 14.70m: Fine to coarse SANDSTONE, minor fine gravel size clasts | | MS | MS | HQTT | 100 | | | 169 | 14.5 | | | | 14.75m: DD, 0° dip, hammer break | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

General Log - 5/04/2019 11:16:49 a.m. - Produced with Core-GS by GeRoc

Box 3, 8.0-11.2m

Box 4, 11.2-14.1m

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 4 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|--|----------------|-------------|--------|--------------|-------------|--|--|--|--|--|--|--|--|--|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | |
| UW-SW Pakiri | 15.0m: Slightly weathered, grey and brown, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | 15.00m: J, 5° dip, UN, SM, VN, FeSt 15.00 - 15.10m: J, ExCS, 0 to 30, UN, SM, VN, black st, trace FeSt 15.20m: J, 60° dip, UN, R, VN, CN & orthog, 50, UN, R, VN, CN 15.27 - 15.34m: J, ExCS, 10 to 20, UN, SM, T-VN, CN to black st with minor FeSt 15.44 - 15.49m: J, 10, VCS, UN, R to Wavy, UN, SM, VN, FeSt, black specs 15.50m: J, 60° dip, UN, SM, VN, FeSt, black specs 15.60m: J, 60° dip, Wavy, UN, R, VN, FeSt 15.68m: J, -30° dip, UN, SM, T-VN, CN 15.76 - 15.80m: J, ExCS, 30-40, UN, SM to R, VN, FeSt, black specs 16.06m: DD, 5° dip, UN, SM, T, CN 16.36m: J, 20° dip, UN, R, VN, CN 16.37m: J, -60° dip, UN, SM, VN -N, trace brown fine sand 16.50 - 16.70m: J, 50° dip, ExxCS, UN, SM, VN, CN to black staining & / or FeSt 17.00m: J, 60° dip, Wavy UN, SM & Orthog UN, SL, VN, minor FeSt 17.05 - 17.25m: J, Orthog 20 to 70, UN, SM, T-VN, CN 17.30m: J, 70° dip, ExCS, UN, SL to SM, VN, CN to FeSt and black st 17.30 - 17.40m: BZ, Rec as f-c gvl, lower contact on 70, UN, SM, VN, FeSt, black st & orthog 70 to 90 (curved) UN, R, T-VN, CN 17.90m: DD, 10° dip 18.00m: DD 18.35 - 18.65m: J, 70° dip, to 90 (wavy), UN, SM to R, VN, minor black staining and FeSt | 25 | | | | | | | | | | | | | | | | | |
| | 15.76m: Lense of grey SILTSTONE | | | | HQTT | 86 | | | | | | | 40 | | | | | | | | | | | | | | | | | | |
| | 15.85m to 16.2m: Trace fine gravel size clasts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16.7m: Slightly weathered, grey and brown, fine to medium SANDSTONE. Weak | | | | | HQTT | 100 | | | | | | | 63 | | | | | | | | | | | | | | | | | |
| UW Pakiri | 17.4m: Grades to slightly weathered, grey and brown, fine to coarse SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18.0m-18.35m: Minor fine to medium gravel size clasts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.03 - 19.05m: Grey, SILTSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.05m: Unweathered, grey, fine to medium SANDSTONE, grading to fine carbonaceous SANDSTONE from 19.16m. Weak to moderately strong | | | | | | | | | | | | | 19.03m: B, 5° dip, UN, SM, VN, grey CS 19.05m: B, 5° dip, UN, SM to ST, SM, VN, grey CS | | | | | | | | | | | | | | | | | |
| | 19.25m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 19.40 - 19.50m: Trace fine gravel size clasts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19.5m: Unweathered, grey, fine to medium SANDSTONE, some pockets of grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | 19.50m: DD, 0° dip 19.65m: DD, 0° dip, Hammerr break | | | | | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 5 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|--|--|-----------------|-------------------|---------|--------|-----------|-------------|---------------------------------------|---------|---|----------------|----------------|-------------|--------|--------------|-------------------|------|--|-----|------|---|-----|------|--|------|------|---------------------------------------|-----|------|--|------|------|--|-----|------|---|---------------------|--|--|--|--|--|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 19.5m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE, some pockets of fine to coarse SANDSTONE. Weak to moderately strong 20.21 - 20.22m: Carbonaceous fine SANDSTONE 20.22 - 21.25m: Calcite vein, VN, approx 90 deg dip | | UW MW SW CN UN VW VW EW | US MS CS UN VW VW EW | HQTT | 100 | | 163 | 20.5 | | 2000 600 200 100 50 20 | 98 | 20.21m: B, 10° dip, UN, SM, VN, CN 20.22m: B, 5° dip, UN, SM, VN, CN [DD] 20.41m: DD, 10° dip | 25 50 75 | | | | | Box 7, 19.7-22.5m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 20.65m: Grading to unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | 21.0 | 21.00m: DD, 0° dip 21.05m: J, 90° dip, UN, SM, VN, Calcite 21.25m: B, 2° dip, UN, SL, VN, Calcite [DD] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 21.11m: Unweathered, grey, carbonaceous fine SANDSTONE, some thin (20mm to 50mm) beds of dark grey SILTSTONE. Weak to moderately strong 21.25 - 21.55m: Calcite vein, VN, approx 90 deg dip 21.50 - 22.02m: Calcite veins, VCS, VN, approx 70 to 90 deg dip | | | | | | | | | | | | | | | | | | | | | 162 | 21.5 | 21.80m: J, 90° dip, UN, SM to R, VN, Calcite 21.85m: J, 70° dip, UN, SM, VN, Calcite 21.90m: J, 50° dip, UN, R, T-VN, CN 21.96m: J, 20° dip, UN, SL, T-VN, CN 22.10m: J, 60° dip, UN, R, VN, CN | | | | | | | | | | | | | | | | | | | | | | | | |
| | 21.62m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 21.92 - 21.97m: Unweathered, grey, SILTSTONE | | | | | | | | | | | | | | | | | | | | | | | | 161 | 22.5 | 22.45m: J, 20° dip, UN, SM, T-VN, CN 22.50m: DD, 5° dip | | | | | | | | | | | | | | | | | | | | | |
| | 21.97m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine gravel size clasts in fine to coarse sand matrix. Matrix supported 22.10 - 22.50m: Calcite vein, VN, approx 80 deg dip | | | | | | | | | | | | | | | | | | | | | | | | | | | 23.0 | 23.0 | 22.84m: DD, 10° dip, UN, SM, T-VN, CN | | | | | | | | | | | | | | | | | | |
| | 22.25m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 22.44m: Lense of SILTSTONE 22.45 - 22.50m: Carbonaceous fine SANDSTONE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 160 | 23.5 | 23.18m: B, 10° dip, UN, SL, T-VN, CN 23.50m: J, 30° dip, UN, SM, VN, calcite 23.82m: J, 20° dip, UN, SM, VN, calcite | | | | | | | | | | | | | | | |
| | 22.5m: Unweathered interbedded grey fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. Bedding is very thin to moderately thin (15mm to 110mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 24.0 | 24.0 | 24.00m: B, 15° dip, UN, SM to SL, VN, calcite, grey sandy silt 24.12m: B, 15° dip, UN, SL, VN, calcite, trace grey silt | | | | | | | | | | | | |
| | 23.0m: Unweathered grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine gravel in fine to coarse sand matrix. Matrix supported. 23.13m: Grades to fine to coarse SANDSTONE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 169 | 24.5 | 24.42 - 24.60m: J, 60° dip, UN, R, T-VN, CN 24.75 - 24.76m: J, 15° dip, ExCS, UN, SM to SL, VN, calcite 24.96m: J, 15° dip, UN, SM, VN, calcite 24.98m: J, 60° dip, UN, SM to ST, SM, T-VN, CN | | | | | | | | | |
| | 23.18: Unweathered, interbedded, grey, fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. Beds are very thin (10mm) to moderately thin (140mm) 23.20 - 23.28m: Carbonaceous 23.53 - 23.65m: Fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Lugeon Test @ 24.0m | | | | | | | | |
| | 24.0m: Unweathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine gravel in fine to coarse sand matrix 24.12m: SILTSTONE, some lenses of fine SANDSTONE and fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 24.2m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong 24.24 - 24.28m: Carbonaceous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 24.64m: Unweathered, interbedded, grey carbonaceous fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 6 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| UW Pakiri | 25.0m: Unweathered, interbedded grey fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 158 | 25.0 | | | 96 | 25.00m: J, 10° dip, UN, SM T-VN, CN 25.25m: BF, 20° dip, UN, SL to SM, VN, calcite 25.50m: BF, 15° dip, UN, SM, VN, brown silt 25.58m: BF, 15° dip, UN, SM, VN, CN 25.88 - 25.90m: BF, 10° dip, to 20, ExCS, Wavy, UN, SM to UN, SM, VN, CN to brown silt 26.01m: BF, 15° dip, UN, SL, VN, calcite, brown silt 26.07m: BF, 15° dip, UN, SL, VN, Calcite, striated 26.10m: BF, 15° dip, PL, SM, VN, calcite 26.30m: J, 15° dip, UN, SL to SM, T-VN, CN 26.37m: J, 15° dip, ST, SL, VN, calcite 26.56m: BF, 15° dip, UN, SL to SM, VN, calcite 26.70m: J, 15° dip, UN, SM, VN, calcite 27.00m: BF, 15° dip, UN, SM, VN, CN 27.32m: J, 15° dip, PL, R, T-VN, trace calcite 27.71m: J, 50° dip, UN, SL, VN, minor calcite 27.80m: J, 30° dip, ST, SM, T-VN, trace dark green st & orthog 20, UN, SL, T-VN, trace dark green st 27.82m: J, 10° dip, UN, SM, VN, faint striations [DD] 28.12m: BF, 15° dip, PL, R to UN, SL, VN, dark greenish grey st 28.40m: DD, 0° dip, Hammer break 28.50m: DD, 0° dip 28.77m: J, 20° dip, UN, SM, T-VN, CN 29.40m: DD, 0° dip, Hammer break | 25 50 75 | | | | |
| | 25.35m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | |
| | 25.5m: Unweathered, interbedded, grey fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong. Siltstone beds are moderately thin (c. 80mm), sandstone beds are very thin (c. 20mm-60mm) | | | | | | | | | | | | | | | | | |
| | 27.80 - 28.00m: Calcite vein, very narrow, approx 70 deg dip, stepped to 80 deg dip | | | | | | | | | | | | | | | | | |
| | 28.12m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | |
| | 28.74 - 28.90m: Lenses of carbonaceous fine SANDSTONE and grey SILTSTONE | | | | | | | | | | | | | | | | | |
| | 29.00 - 29.30m: Calcite vein, very narrow, approx 80 deg dip | | | | | | | | | | | | | | | | | |
| | 29.40m: DD, 0° dip, Hammer break | | | | | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 7 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|--|--|---|-----------------|---------------|-----------------|-------------------|---------------------|--------|-----------|-------------------------|--------------|-----------------------|---------|---|----------------|-------------|--------|--------------|--------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| UW Pakiri | 30.0m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE.. Weak to moderately strong | | UW | MS | HQTT | 100 | Lugeon Test @ 30.0m | 153 | 30.5 | [Yellow dotted pattern] | 2000 | 600 | 200 | 30.00m: DD, 0° dip | 25 | | | | Box 10, 27.6-30.6m |
| | 30.50m: Calcite vein, very narrow, approx 60 deg dip | | | | | | | | | | | | | 30.60m: J, 60° dip, UN, SM, VN, brown calcite | | | | | |
| | 30.88m: Unweathered, dark grey SILTSTONE. Weak to moderately strong | | | | | | | | | | | | | 30.92m: J, 30° dip, UN, SM, VN, calcite to DD, 0, UN, R | | | | | |
| | 31.06m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | 31.06m: BF, 2° dip, UN, R, T-VN, CN | | | | | |
| | 31.32 - 31.50m: Calcite vein, very narrow, approx 70 deg dip | | | | | | | | | | | | | 31.50m: DD | | | | | |
| | 31.60 - 31.65m: Carbonaceous (minor black carbonaceous specs) | | | | | | | | | | | | | 31.65m: DD, 0° dip, Hammer break, UN, R, T, trace black specs (carbonaceous) | | | | | |
| | 32.6m: Grading to fine to medium SANDSTONE | | | | | | | | | | | | | 31.98m: DD, 5° dip, to 20 (curved) Hammer break | | | | | |
| | 32.76m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | 32.45m: DD, 0° dip, to 10, Hammer break. UN, R, T, minor black specs (carbonaceous) | | | | | |
| | 33.3m: Grades to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | 33.00m: DD, 0° dip, Hammer break | | | | | |
| | 34.38m: Unweathered, interbedded fine SANDSTONE and dark grey SILTSTONE. Weak to moderately strong | | | | | | | | | | | | | 33.56m: DD, 0° dip, Hammer break | | | | | |
| 34.50m: Carbonaceous | | 34.16m: DD, 5° dip, to 20 (curved) Hammer break | | | | | | | | | | | | | | | | | |
| 34.55m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | 34.38m: B, 15° dip, UN, SL, VN, trace grey silt | | | | | | | | | | | | | | | | | |
| 34.60m: Lense of SILTSTONE | | 34.50m: J, 5° dip, UN, SL, T-VN, CN | | | | | | | | | | | | | | | | | |
| 34.80 - 35.50m: Calcite vein, very narrow, 90 deg dip | | 34.55m: B, 10° dip, UN, SM to ST, SM, VN, carbonaceous | | | | | | | | | | | | | | | | | |
| 34.87m: Fine SANDSTONE | | 34.87m: B, 15° dip, UN, SL to ST, SL, VN, carbonaceous | | | | | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 8 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
(NZTM2000) 1742247.40 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
R.L. COLLAR: 183.50m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | |
|-----------------|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---|--|--|--|--|----------------|-------------|--------|--------------|-------------|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | | | | |
| UW Pakiri | 34.87m [Cont'd]: Unweathered, grey, fine SANDSTONE. Weak to moderately strong. 35.05m: Lense of SILTSTONE | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35.1m: Grades to fine to coarse SANDSTONE | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35.3m: Unweathered, grey, fine to medium SANDSTONE, some lenses of fine to coarse SANDSTONE and dark grey siltstone. Weak to moderately strong 35.64 - 35.65m: Very thin bed of dark grey SILTSTONE 35.72 - 35.73m: Carbonaceous | | | HQTT | 100 | | 148 | 35.5 | | | | 96 | 35.05m: BF, 10° dip, UN, SM, T-VN, carbonaceous 35.65m: DD, 0° dip, Hammer break | | | | | | | | | | | | |
| | 35.8m: Grades to fine to coarse SANDSTONE. Weak to moderately strong 36.95m: Calcite vein, very narrow, approx 50 deg dip | | | HQTT | 100 | | 147 | 36.0 | | | | 100 | 36.00m: DD, 0° dip 36.13m: J, 10° dip, Wavy, UN, SM, T, CN | | | | | | | | | | | | |
| | | | | | | 146 | 36.5 | | | | 100 | 36.70m: DD, 0° dip, Hammer break | | | | | | | | | | | | | |
| | | | | | | 145 | 37.0 | | | | 100 | 37.33m: DD, 0° dip, to 15 (curved) 37.50m: DD, 0° dip | | | | | | | | | | | | | |
| | | | | | | 144 | 37.5 | | | | 100 | 37.95m: DD, 0° dip, Hammer break | | | | | | | | | | | | | |
| | | | | | | | 38.0 | | | | 100 | 38.1m: Unweathered, grey, fine to coarse SANDSTONE, minor fine to medium gravel size clasts. Weak to moderately strong 38.25 - 38.60m: Calcite vein, very narrow, approx 70 deg dip 38.60m: 60mm lense of dark grey to greenish grey SILTSTONE and smaller lense of dark grey SILTSTONE | | | | | | | | | | | | | |
| | | | | | | | 38.5 | | | | 100 | 38.60m: DD, 0° dip, UN, SM, T, CN | | | | | | | | | | | | | |
| | | | | | | | 39.0 | | | | 100 | 39.00m: DD, 0° dip | | | | | | | | | | | | | |
| | | | | | | | 39.5 | | | | 100 | 39.55m: DD, 5° dip, Hammer break | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 9 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
(NZTM2000) 1742247.40 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
R.L. COLLAR: 183.50m
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------------------|------------------|-----------------------|-----------------------------------|---------------------------------------|----------------|-------------|--------|--------------|--------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| UW Pakiri | 38.6m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE, minor fine gravel size clasts, trace medium gravel size clasts. Weak to moderately strong | | UW | MS | HQTT | 100 | | 143 | 40.5 | [Yellow dotted pattern] | [Dotted pattern] | 100 | 40.15m: DD, 10° dip, Hammer break | 25 | | | | | Box 14, 38.6-41.2m | |
| | 40.98m: Unweathered, grey, fine SANDSTONE. Weak to moderately strong | | | | | | | | | | | | 40.50m: DD, 0° dip | | | | | | | |
| | 41.2m: Grades to fine to medium SANDSTONE 41.10 - 41.30m: Very closely spaced, very narrow calcite veins, dip approx 70 to 90 41.20 - 42.45m: Trace coarse sand to fine gravel size clasts of dark grey siltstone | | | | | | | | | | | | 41.0 | | | | | | | 40.95 - 41.45m: J, 70° dip, to 90 (curved), UN, SM to R, calcite, some FeSt, green staining & brown staining penetrating up to 5mm |
| | 42.4m: Grades to fine SANDSTONE | | | | | | | | | | | | 41.5 | | | | | | | 41.70m: DD, 0° dip, Hammer break |
| | 42.65m: Grading to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 43.00 - 43.30m: Very narrow to narrow, 70 dip | | | | | | | | | | | | 42.0 | | | | | | | 42.00m: DD, 0° dip |
| | | | | | | | | | | | | | 42.5 | | | | | | | 42.15m: DD, 0° dip, to 15, Hammer break |
| | | | | | | | | | | | | | 43.0 | | | | | | | 42.80m: DD, 0° dip, Hammer break |
| | | | | | | | | | | | | | 43.5 | | | | | | | 43.30m: DD, 0° dip, Hammer break |
| | | | | | | | | | | | | | 44.0 | | | | | | | 43.50m: DD, 0° dip |
| | | | | | | | | | | | | | 44.5 | | | | | | | 43.75m: DD, 20° dip, UN, R, T, CN 43.90m: DD, 0° dip, Hammer break 44.20m: DD, 5° dip, UN, R, T, CN 44.50m: DD, 0° dip, to 20 (curved), Hammer break 44.68m: DD, 5° dip, Wavy, UN, SM, T, CN |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH10

SHEET: 10 OF 10

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 21/05/2018

FINISH DATE: 24/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5978416.83 mN
 (NZTM2000) 1742247.40 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 183.50m
 R.L. COLLAR: 183.50m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------------------|--------|-----------|-------------------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|--------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | Description & Additional Observations |
| UW Pakiri | 45.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | Lugeon Test @ 46.5m | 138 | 45.5 | [Yellow dotted pattern] | 2000 | [Grey shaded area] | 100 | 25 | | | | Box 16, 43.9-46.6m | |
| | 45.17m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 45.25m. Weak to moderately strong 45.35 - 45.40m: Lense of grey SILTSTONE | | | | | | | | | | | | | | | | | | 45.00m: DD, 0° dip |
| | 45.4m: Grading to unweathered, grey, fine to coarse SANDSTONE, trace fine gravel size clasts of dark grey and green siltstone. Weak to moderately strong | | | | | | | | | | | | | | | | | | 45.17m: B, 20° dip, UN, SM, T, CN 45.35m: J, 15° dip, on SILTSTONE lense, UN, SL to UN, SM, T, CN 45.53m: DD, 0° dip, Hammer break |
| | 47.70m: Calcite vein, very narrow, approx 50 deg dip | | | | | | | | | | | | | | | | | | 46.13m: DD, 0° dip, to 10, Hammer break |
| | 48.25m: Calcite vein, tight to very narrow, approx 60 deg dip | | | | | | | | | | | | | | | | | | 46.50m: DD, 0° dip 46.63m: DD, 0° dip, to 5, Hammer break |
| | 49.08 - 49.20m: Calcite vein, very narrow, approx 60 deg dip | | | | | | | | | | | | | | | | | | 47.25m: DD, 0° dip, Hammer break 47.5m: DD, 0° dip, Hammer break |
| | 49.5m: Target depth | | | | | | | | | | | | | | | | | | 47.85m: DD, 0° dip, Hammer break 47.95 - 48.00m: DD, 90° dip, UN, SM, T, CN 47.95m: DD, 0° dip, to 20 48.20m: DD, 0° dip, to 20, Wavy, UN, SM, T, CN 49.00m: DD, 0° dip, to 10, Hammer break |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

COMMENTS: Shear vane No 111. Presented shear vane readings have been corrected. 50mm dia. piezo installed on 25/5/2018

Hole Depth
49.5m

Scale 1:25

Rev.: A

BH11 Log



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 1 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
(NZTM2000) 1741185.81 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|---|--|---|-----------------|---------------|-----------------|-------------------|--------------------------|--------------------------|-----------|-------------|--------------|-----------------------|---------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| Soil | 0.0m: Sandy SILT, some roots; brown mottled dark brown. Stiff, moist, low plasticity | | | | | | | | | | | | | | | | | |
| Residual Soil | 0.2m: SILT, trace fine sand, trace clay, minor roots; yellowish brown, minor black specks, trace orange brown mottles. Stiff, moist, moderate plasticity 0.35m: Minor to some black specs | | | | HQTT | 100 | | 129 | | | | | | | | | | |
| | 0.9m: Becomes yellowish brown mottled light pinkish red. Very stiff, moist, high plasticity | | | | | | | | | | | | | | | | | |
| | 1.2m: SILT, minor fine sand, trace rootlets; light red, minor yellowish brown and white mottles. Very stiff, moist, high plasticity | | | | | | | 128 | | | | | | | | | | |
| | 1.6m: Light pink mottled yellowish brown and greyish white, trace light red mottles. Stiff, wet, high plasticity | | | | SPT | 100 | 142/57 kPa | 0/1 1/1 2/2 N=6 | | | | | | | | | | |
| | 2.1m: Silty fine SAND, becoming fine SAND, minor silt from 2.2m, trace rootlets; light pink to reddish pink, trace orange brown mottles. Loose, saturated. | | | | | | | | 127 | | | | | | | | | |
| | 2.45m: Silty fine SAND, wet | | | | HQTT | 66 | | | | | | | | | | | | |
| | 2.65m: No recovery (core loss) | | | | | | 95/23 kPa | | | | | | | | | | | |
| | 3.0m: Silty fine SAND, trace rootlets; light pink to reddish pink, some orange brown mottles. Loose, wet | | | | SPT | 77 | | 1/1 1/1 1/2 N=5 | | | | | | | | | | |
| | 3.35m: No recovery (core loss) | | | | | | | | | | | | | | | | | |
| | 3.45m: Silty fine SAND, some pockets of fine SAND, minor silt, trace roots; pink, minor whitish grey, orange brown and reddish brown mottles. Loose, wet | | | | | | | | | | | | | | | | | |
| 3.6m-3.65: Yellowish brown, black and whitish grey mottles | | | | HQTT | 100 | | | | | | | | | | | | | |
| 4.35m: No recovery (core loss) | | | | | | | | | | | | | | | | | | |
| 4.5m: Silty fine SAND, trace roots; light pink, minor orange brown, whitish grey and reddish brown mottles, trace black specs. Loose, wet 4.50 - 4.65m: Sandy SILT | | | | SPT | 66 | 55/15 kPa | 0/1 1/1 1/1 N=4 | | | | | | | | | | | |
| 4.8m: No recovery (core loss) | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 1, 0.0-3.5m

General Log - 5/04/2019 11:16:51 a.m. - Produced with Core-GS by GeRoc

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 2 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|--|--|----------------|-------------|--------|--------------|-------------|
| | Soil Classification, colour, consistency / density, moisture, plasticity | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | |
| Residual Soil | 5.0m: Silty fine SAND, trace rootlets; light pink, trace orange brown and greyish white mottles. Loose, saturated | | | | | | 124 | | | | | | | | | | | | | |
| | 5.2m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 5.7m: Sandy SILT, trace rootlets; pinkish red, trace orange brown and greyish white mottles. Firm, wet to saturated, low plasticity | | | | | | | | | | | | | | | | | | | |
| | 5.95m: Orange brown, minor pink and light grey mottles | | | | | | | | | | | | | | | | | | | |
| CW Pakiri | 6.5m: Push Tube | | | | | | | | | | | | | | | | | | | |
| | 6.5m: Sandy SILT, trace rootlets; orange brown. Stiff, wet, non plastic to low plasticity | | | | | | | | | | | | | | | | | | | |
| | 6.7m: Becomes SILT, minor fine sand; light grey, minor light pink and orange brown mottles, trace black specs | | | | | | | | | | | | | | | | | | | |
| | 6.95m: Sandy SILT; dark brown mottled black. Firm, saturated, non plastic to low plasticity | | | | | | | | | | | | | | | | | | | |
| | 7.15m: SILT, minor fine sand, trace rootlets; orange brown, mottled light pink. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | | |
| | 7.25m: Silty fine SAND; light pink. Loose, wet | | | | | | | | | | | | | | | | | | | |
| | 7.35m: Sandy SILT; light brownish grey mottled orange brown. Very stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | | |
| | 7.5m-8.0m: Push Tube | | | | | | | | | | | | | | | | | | | |
| | 8.0m: Silty fine SAND; light yellowish brown mottled black. Loose, wet | | | | | | | | | | | | | | | | | | | |
| | 8.35m: SILT, minor fine sand; orange brown mottled light grey. Stiff to very stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | | |
| | 8.45m: Sandy SILT; brown minor orange brown and black mottles. Firm, saturated, low plasticity | | | | | | | | | | | | | | | | | | | |
| | 8.6m: SILT, some fine sand; light brown mottled light grey and dark reddish brown. Stiff to very stiff, moist to wet, non plastic to low plasticity | | | | | | | | | | | | | | | | | | | |
| 8.80 - 8.85m: Sandy SILT, brown minor black mottles | | | | | | | | | | | | | | | | | | | | |
| 8.95 - 9.08m: Sandy SILT; Orange brown | | | | | | | | | | | | | | | | | | | | |
| 9.12m: Fine SAND, trace to minor silt; grey, minor orange brown mottles. Medium dense, wet | | | | | | | | | | | | | | | | | | | | |
| 9.10m: Pocket of SILT, light whitish grey | | | | | | | | | | | | | | | | | | | | |
| 9.45m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 3 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|------------------------------|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | |
| CW Pakiri | 10.0m: No recovery (core loss) | | | | HQTT | 0 | | 119 | | | | | | | | | | | | |
| | 10.5m: Fine SAND, trace to minor silt; grey minor brown and orange brown mottles. Medium dense, wet | | | | SPT | 100 | SPT @ 10.5m SPT Hammer broke | 10.5 | | | | | | | | | | | | |
| | 11m: Fine SAND, minor silt; brownish grey, mottled brown and orange brown. Medium dense. wet | | | | HQTT | 100 | | 11.0 | | | | | | | | | | | | |
| HW Pakiri | 11.95m: SILT, minor clay, trace fine sand; orange brown, becoming grey mottled light brownish grey from 11.98m. Stiff, wet, low to moderate plasticity | | | | HQTT | 100 | | 11.5 | | | | | | | | | | | | |
| | 12.4m: SILT, minor fine sand; orange brown. Very stiff to hard, wet, non plastic [fissile] | | | | HQTT | 100 | | 12.0 | | | | | | | | | | | | |
| | 12.5m: Highly weathered, light grey, SILTSTONE. Extremely weak [SILT, minor fine sand, very stiff to hard, moist, low plasticity] 12.61m: Grey becoming brown from 12.68m 12.72 - 12.80m: Fine SANDSTONE | | | | HQTT | 100 | | 12.5 | | | | | | | | | | | | |
| | 12.9m: Moderately weathered, brown, fine SANDSTONE. Very weak 13.02 - 13.07m: Trace black specs 13.18 - 13.25m: Fine to medium SANDSTONE | | | | HQTT | 100 | | 13.0 | | | | | | | | | | | | |
| | 13.25m: Moderately weathered grey SILTSTONE. Very weak, strongly cemented | | | | HQTT | 100 | | 13.5 | | | | | | | | | | | | |
| MW Pakiri | 13.5m: Moderately weathered, brown fine SANDSTONE. Extremely weak to very weak | | | | HQTT | 100 | | 14.0 | | | | | | | | | | | | |
| | 13.75m: Brown, fine to medium SANDSTONE | | | | HQTT | 100 | | 14.5 | | | | | | | | | | | | |
| | 13.9m: Moderately weathered, grey SILTSTONE. Very weak | | | | HQTT | 100 | | 15.0 | | | | | | | | | | | | |
| | 13.96m: Moderately weathered, brown, fine SANDSTONE, grading to fine to coarse SANDSTONE from 14.1m. Very weak | | | | HQTT | 100 | | 15.5 | | | | | | | | | | | | |
| SW-MW Pakiri | 14.7m: Slightly weathered, grey and brown, fine to medium SANDSTONE. Very weak to weak | | | | HQTT | 100 | | 16.0 | | | | | | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 4 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| SW-MW Pakiri | 15.0m: Slightly weathered grey and brown, fine to coarse SANDSTONE. Very weak to weak 15.07 - 15.15m: Grey carbonaceous fine SANDSTONE 15.15 - 15.23m: Grey fine to medium SANDSTONE 15.35m: Lense of light brown silty CLAY | | UW | US | HQTT | 100 | | 114 | 15.0 | | 2000 | 83 | 15.15m: B, 0° dip, UN, SM, T, FeSt 15.23m: B, 5° dip, UN, SM, T, FeSt 15.35m: J, Othog 60 to 90, UN, SM, VN, FeSt 15.55m: J, Orthog, 30 to 80m, UN, R to PL, R, VN, FeSt | | | | | | |
| | 15.90 - 16.05m: Lense of brown fine to medium grained SANDSTONE 16.05 - 16.10m: Grey fine grained carbonaceous SANDSTONE | | | | | | | 113 | 16.0 | | | | 15.82m: J, -20° dip, UN, SM, VN, FeSt 15.88m: J, 30° dip, UN, SM, VN, brown silty fine sand, FeSt 16.20m: J, -20° dip, UN, SM, T, FeSt 16.29m: J, 10° dip, UN, SM, VN, brown fine sand, FeSt 16.40m: J, 5° dip, PL, R, T, CN, slight green st 16.45m: J, 0 to 30 (wavy), R, T, CN 16.51m: J, 10° dip, UN, R, T, FeSt 16.62m: J, 0 to 20 (wavy), R, T, CN 16.65m: J, 30° dip, ST, R, VN, FeSt 16.75m: J, Othog 30, R, T, CN 16.90m: J, 5° dip, PL, R, T, FeSt 17.20m: J, 60° dip, UN, R, T-VN, FeSt | | | | | | |
| | 16.32m: Slightly weathered grey and brown, fine to medium SANDSTONE. Weak | | | | | | | 112 | 16.5 | | | | 17.40 - 17.58m: J, 60° dip, UN, R, N, silty fine sand, FeSt 17.45 - 17.58m: J, VCS, 0 - 20, UN, SM, T-VN, FeSt 17.58 - 17.60m: J, 0° dip, ExCS, PL, SM, T to N, FeSt, brown sandy SILT 17.72m: J, 0° dip, UN, SM to ST, SM, T, FeSt 18.00 - 18.10m: J, ExCS, 0 - 20, UN, SM to R, T-VN, FeSt | | | | | | |
| | 17.7m: Slightly weathered, grey minor brown discolouration, fine to medium SANDSTONE. Weak | | | | | | | 111 | 17.5 | | | | 18.20 - 18.45m: J, 90° dip, UN, SM, N, FeSt 18.20m: J, 40 to 60, UN, SM, T-VN, FeSt 18.40 - 18.45m: J, VCS, 20, UN, SM, VN, FeSt 18.68m: J, 30° dip, UN, SM, VN, or-br, silty fine SAND, FeSt 18.75m: J, 10° dip, UN, SM, T-VN, FeSt 18.80m: J, 30° dip, UN, SM, T, CN 18.90m: J, -40° dip, UN, SM, T, CN 19.05m: J, Orthog, 30, UN, SM, VN, or br sandy silt, FeSt 19.12 - 19.18m: J, 20° dip, ExCS, PL, R, T-VN, FeSt | | | | | | |
| | 18.0-18.1m: Slightly weathered brown fine to medium SANDSTONE | | | | | | | 110 | 18.0 | | | | 19.50m: J, 30° dip, UN, SM, T, minor FeSt | | | | | | |
| | 18.6-18.77m: Slightly weathered brown fine to medium SANDSTONE | | | | | | | | 19.0 | | | | 60 | | | | | | |
| | 19.02m-19.18m: Moderately weathered, brown, fine to medium SANDSTONE | | | | | | | | 19.5 | | | | 66 | | | | | | |
| | 19.45m: Slightly weathered, grey, CONGLOMERATE. Weak. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported. | | | | | | | | | | | | | | | | | | |
| | 19.77m: Moderately weathered, brown, CONGLOMERATE. Extremely weak. [Fine to coarse SAND, some fine to medium gravel] | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 5 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | |
|-----------------|--|---|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|-------------------|-------------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering USCS: MW, ML, OL, CL, CH, SW, SM, OL, SL, ML, WL, EW | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| SW Pakiri | 20.0m: Slightly weathered, grey, CONGLOMERATE. Weak to moderately strong. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported. 20.2m: Slightly weathered grey fine to medium SANDSTONE. Weak to moderately strong 20.30 - 20.35m: Brown, fine to medium SANDSTONE 20.50m: Grades to grey, fine to coarse SANDSTONE 20.70 - 20.80m: Trace fine gravel size clasts | UW | | HQTT | 100 | | 109 | 20.5 | | | 60 | 20.00m: J, 5° dip, ST, R, T, FeSt 20.04m: J, 20° dip, ST, R, T, FeSt 20.20m: B, 20° dip, PL, R to UN, R, VN, dark brown fine sand, FeSt 20.30 - 20.35m: J, 0 to 15, PL, R to UN, SM, T-VN, FeSt 20.50m: J, 20° dip, Wavy, UN, SM, T, CN 20.65 - 20.80m: J, 60° dip, UN, SM, VN-N, FeSt 20.65m: J, 30° dip, UN, SM, VN, FeSt 20.75m: J, -15° dip, UN, SM, VN, FeSt 20.90m: J, 60° dip, UN, SM, T-VN, FeSt 20.95m: J, 20° dip, UN, SM, T, CN 21.10 - 21.25m: J, 80° dip, UN, SM, VN, dark br silty fine sand, minor reddish br FeSt 21.15 - 21.25m: J, VCS, UN, SL to SM, T-VN, FeSt 21.25 - 21.50m: J, 85° dip, UN, R, VN, dark brown fine sand 21.30m: J, 60° dip, UN, SM, VN, dark brown to black fine sand 21.62 - 21.66m: BZ, Rec as f-m angular gvl 21.66m: J, 90° dip, UN, SL, VN, Grey silty clay and orthog 90, ST, SM, T, CN 21.68 - 22.70m: J, 90° dip, UN, SM, N, fine or br sand, FeSt | 25 50 75 | | | | Box 7, 18.8-21.3m | |
| | 21.6m: Grading to CONGLOMERATE. Conglomerate is fine to medium gravel in a fine to coarse sand matrix. Matrix supported 21.75m: Slightly weathered, grey, fine to medium SANDSTONE. Weak to moderately strong | UW | | HQTT | 100 | | 108 | 21.5 | | | 83 | | | | | | | |
| UW-SW Pakiri | 22.7m: Unweathered to slightly weathered, dark grey, fine to coarse SANDSTONE. Very weak to weak 22.75m: Unweathered to slightly weathered, grey, fine to medium SANDSTONE. Weak | UW | | HQTT | 100 | | 107 | 22.5 | | | 80 | | | | | | | |
| | 23.47 - 23.50m: Dark grey, fine grained carbonaceous SANDSTONE. Weak to moderately strong 23.50 - 23.55m: Dark grey, fine to medium SANDSTONE, minor small (1cm) lenses of grey SILTSTONE. Very weak to weak 24.00 - 24.20m: Grey, fine to coarse SANDSTONE | UW | | HQTT | 100 | | 106 | 23.5 | | | 66 | 23.50m: B, 2, UN, SM, T, CN 23.52 - 23.54m: J, ExCS, 0 - 15, ST, R, T, CN to trace FeSt 23.56m: B, 0° dip, ST, R, T, CN 23.82m: J, 5° dip, PL, R, T, CN 23.83m: J, 15° dip, UN, SM, T, CN 23.88m: J, 60° dip, UN, SM, T, CN 24.00 - 24.05m: J, VCS, 10-20, UN, SM, T, CN 24.18m: J, 60° dip, UN, SM, VN, FeSt 24.20m: J, 0, UN, SM, T, CN 24.23m: J, -60° dip, UN, SM, VN, FeSt 24.27m: J, 0° dip, UN, SM, T, CN 24.28m: J, 0, UN, SL, T, black CC 24.30 - 24.60m: J, 90° dip, UN, SM, VN, black st 24.50 - 24.60m: J, 70° dip, VCS, Orthog, UN, SM, VN, FeSt 24.60 - 24.75m: DD, 70-90, UN, SM, rec as f-c gvl 24.85m: J, 40° dip, UN, R, T, CN | 25 50 75 | | | Box 8, 21.3-24.0m | | |
| | 24.6-25.0m: Grey, fine to coarse SANDSTONE | UW | | HQTT | 100 | | 105 | 24.5 | | | 33 | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 6 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|---|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 25.0m: Unweathered grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 104 | 25.5 | | | 66 | 25.05 - 25.30m: J, 70° dip, UN, R, T-VN, FeSt 25.35m: J, -60° dip, UN, SL - SM, N, brown silty fine sand, FeSt 25.43m: J, 40° dip, UN, SM, T, CN 25.50m: J, 60° dip, UN, SM, N, brown silty sand, FeSt | | | | | | |
| | 26.05-26.1m: Grey, fine to medium, carbonaceous SANDSTONE | | | | HQTT | 100 | | 103 | 26.0 | | | 100 | 26.10m: J, 0° dip, UN, SM, T, CN | | | | | | |
| | 26.1m: Grading to grey fine to coarse SANDSTONE | | | | | | | 26.5 | 26.5 | | | | 26.15 - 26.65m: J, 70° dip, UN, SM, VN-N, FeSt | | | | | | |
| | 27.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong. | | | | | | | 102 | 27.0 | | | | | | | | | | |
| | 27.50 - 27.55m: Dark grey | | | | | | | | 27.5 | | | | | | | | | | |
| | 26.55m: Unweathered, dark grey, SILTSTONE. Weak to moderately strong | | | | HQTT | 100 | | | 27.5 | | | 73 | 27.55m: B, 5° dip, UN, SM, T, CN 27.67m: J, 5° dip, UN, SM, VN, grey clay some fine sand | | | | | | |
| | 27.65m: Unweathered, fine grading from 27.75m to fine to medium, grey SANDSTONE | | | | | | | | 28.0 | | | | | 27.85m: B, 10° dip, UN, R, T, CN | | | | | |
| | 27.85m: Unweathered dark grey SILTSTONE. Weak to moderately strong | | | | | | | | 28.0 | | | | | 27.91 - 28.05m: J, VCS, 0, UN, SM, T, CN & orthog, 90, UN, SM, T, minor FeSt & light green st 28.05m: J, 20° dip, UN, SL, T, CN | | | | | |
| | 28.05m: Unweathered grey fine SANDSTONE, becoming fine to coarse from 28.2m Weak to moderately strong | | | | | | | | 28.5 | | | | | 28.15 - 28.45m: J, 85° dip, UN, SM, VN, FeSt 28.16m: J, 30° dip, UN, R, T, dark green st 28.25 - 28.80m: J, 80° dip, ExCS to VCS, UN, SL to R, VN, FeSt | | | | | |
| | 28.10 - 28.16m: carbonaceous | | | | | | | | 29.0 | | | | | 28.80 - 28.90m: J, 80° dip, VCS, UN, SL to R, VN, FeSt | | | | | |
| 29.0m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | | | HQTT | 100 | | 100 | 29.0 | | | | 76 | 29.00m: DD, 10° dip | | | | | | |
| | | | | | | | | 29.5 | | | | | 29.60m: DD, 15° dip | | | | | | |

Lugeon Test @ 27.0m (27-30m)

Box 9, 24.0-26.8m

Box 10, 26.8-29.6m

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth 49.5m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 7 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 30.0m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 99 | | | 2000 | 80 | 30.00m: J | 25 | | | | | |
| | 31.5m: Unweathered grey fine to medium SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 100 | | 30.5 | | | 600 | | 31.00m: J, 15° dip, UN, SM, T, minor FeSt | 50 | | | | | |
| | | | UW | US | HQTT | 100 | | 31.0 | | | 400 | | 31.12 - 31.50m: J, 70° dip, VCS, 70 to 90, UN, SM to SL, VN, dark brown and black FeSt | 75 | | | | | |
| | | | UW | US | HQTT | 100 | | 31.5 | | | 200 | | 31.45m: J, -70° dip, PL, R, T-VN, CN 31.62m: J, 0° dip, UN, SM, T-VN, minor FeSt | | | | | | |
| SW Pakiri | 33.4m: Slightly weathered, grey and brown fine to medium SANDSTONE. Very weak | | UW | US | HQTT | 83 | | 32.0 | | | 20 | 32 | 31.90m: J, 70° dip, PL, R, T, CN | | | | | | |
| | | | UW | US | HQTT | 100 | | 32.5 | | | 20 | | 32.00 - 32.20m: J, 90° dip, UN, SM, T-VN, FeSt 32.00 - 32.10m: J, VCS, Orthogonal, 40-60, UN, SM -R, T-VN, FeSt | | | | | | |
| | | | UW | US | HQTT | 100 | | 33.0 | | | 20 | | 32.20 - 32.40m: J, VCS, 60-90, orthog, PL, R, to UN, R, T-VN, FeSt 32.40 - 32.65m: J, ExCS, 60-90, orthog, PL, R, to UN, R, T-VN, FeSt | | | | | | |
| | | | UW | US | HQTT | 100 | | 33.5 | | | 20 | | 32.65 - 32.75m: BZ, Rec f-c ang gvl 32.75 - 33.00m: J, VCS, 40-90, orthog, PL, R, to UN, R, T-VN, FeSt | | | | | | |
| UW Pakiri | 34.5m: No recovery (core loss) | | | | | | | 34.0 | | | | 0 | 33.10 - 33.50m: J, 80° dip, UN, SM, VN, FeSt 33.12 - 33.55m: J, 80° dip, UN, SL, VN, FeSt | | | | | | |
| | 34.5m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | | | | 34.5 | | | | 20 | 33.40 - 33.90m: J, VCS to ExCS, 60-90, UN, SM to SL, VN to N, brown silt infill, FeSt, trace striations 33.95m: J, 90° dip, UN, SM, VN, FeSt 34.05m: J, 60° dip, UN, SM, VN - N, grey clayey silt, FeSt & orthog 50, UN, SM, VN, striated 34.10 - 34.25m: BZ, ExCS, UN, SM to SL, FeSt. Rec as f-c gvl | | | | | | |
| | | | | | | | | 34.5 | | | | 20 | 34.50 - 34.60m: J, 70° dip, ExCS, UN, SM, VN-N, grey silty clay, FeSt 34.90 - 35.00m: J, -70° dip, ExCS, UN, SM, VN-N, brown silt, FeSt | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

Box 11, 29.6-32.1m

Box 12, 32.1-35.0m

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 8 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------------------------|-----------------------|--|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | | | | | | |
| UW Pakiri | 35.0m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | UW | US | HQTT | 40 | | 94 | 35.5 | | 2000 600 200 50 20 | 20 | 35.00 - 35.10m: BZ, Rec f-c gvl | 25 50 75 | | | | |
| | 35.1m: No recovery (core loss) [Inferred shear zone] | | | | | | | | | | | | | | | | | |
| | 36.0m: Unweathered grey fine to coarse SANDSTONE. Weak to moderately strong | | | | HQTT | 100 | | 93 | 36.0 | | | 86 | 36.00 - 36.20m: J, 70° dip, ExCS, UN, SM to ST, SM, VN, FeSt, minor striations 36.20 - 36.50m: J, -80° dip, UN, R, T, CN 36.50m: DD, 10° dip 36.70m: DD, 30° dip | | | | | |
| | 37.5m-37.80m: Carbonaceous | | | | | | | 92 | 37.0 | | | | 36.80 - 37.50m: J, 80° dip, UN, SM, T, CN | | | | | |
| | 37.9m: Interbedded grey fine to medium SANDSTONE and SILTSTONE. Weak to moderately strong | | | | HQTT | 100 | | 91 | 37.5 | | | | 37.45m: J, Orthog, 40 to 80, PL, R to UN, SM, T, CN 37.50m: B, 15° dip, UN, SM, VN, 37.58m: J, 60° dip, UN, R, T, CN 37.64m: J, -60° dip, UN, R, T, CN 37.70m: J, 5° dip, UN, SM, T- VN, grey fine sand 37.90m: B, 2° dip, UN, SM, T- VN, CN | | | | | |
| | 38.5m: Unweathered grey fine to medium SANDSTONE, minor thin to moderately thin beds of dark grey SILTSTONE. Weak to moderately strong | | | | | | 90 | 38.0 | | | | 33 | 37.95 - 37.96m: BZ, Upper & lower contact is PL, SL, VN, grey silty clay and dark grey sandy silt 38.06m: B, 0° dip, UN, SL to SM, T- VN, CN 38.14 - 38.22m: BZ, ExCS, UN, SL to SM, VN, CN 38.22 - 38.38m: J, 90° dip, VCS & Orthog 90, UN, SM, T, CN 38.42m: J, 90° dip, UN, SM, T, CN 38.45m: J, 70° dip, UN, SM, T, CN 38.50 - 38.80m: J, 70° dip, VCS, PL, R to UN, SL, T- VN, CN 38.80m: J, 0° dip, UN, SL to ST, SL, T, CN & Orthog 20, UN, SM, VN, grey silt 38.82m: J, 0° dip, UN, R, T, CN 38.82 - 39.00m: J, 80° dip, UN, SL, T- VN, CN 38.90m: J, 5, PL, R, T- VN, CN 39.00m: J, 5° dip, UN, SL, VN, grey silt 39.10m: J, 0° dip, UN, SM, VN, grey silt 39.22 - 39.27m: BZ, Rec f-m gvl, upper contact UN, SL 39.30 - 39.60m: J, 65° dip, UN, SM, VN, brown FeSt 39.70m: J, 0, PL, R, T- VN, CN 39.85m: DD, 0° dip, UN, R, T, CN | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 9 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
(NZTM2000) 1741185.81 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | ROCK DEFECTS | | | | | | | | | | |
|-----------------|---------------------|---------------|-----------------|-------------------|---------|--------|---|-------------|------------|-----------------------|---------|---|--|-------------|--------|--------------|-------------|
| | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | UW | MS | HQTT | 100 | | 89 | 40.0m: Unweathered fine to coarse grained SANDSTONE, some thin beds of dark grey SILTSTONE. Weak to moderately strong | | | | 90 | 40.15m: J, 90° dip, UN, R, VN, Black st 40.25m: J, 0° dip, UN, SM, T-VN, CN 40.45m: J, 5° dip, ST, SM, VN, trace grey silt 40.50m: B, 0° dip, UN, SM-R, T-VN, CN 40.60m: DD, 2° dip | | | | | |
| | UW | MS | HQTT | 100 | | 88 | 40.6m: Interbedded grey fine to medium SANDSTONE and dark grey SILTSTONE. Weak to moderately strong | | | | 93 | 41.10m: DD 41.20m: J, Orthog, 0, UN, R, T, CN & 90, UN, R, T, dark green st, trace FeSt 41.35m: J, 0° dip, UN, SM, T, CN | | | | | |
| | UW | MS | HQTT | 100 | | 87 | 41.1m: Unweathered grey fine to medium SANDSTONE, minor thin beds of dark grey SILTSTONE. Weak to moderately strong | | | | | | 41.60m: J, 70° dip, PL, R, T-VN, black st, FeSt 41.67m: B, 0-15, UN, SM, T-VN, CN 41.71m: J, Orthog 50, PL, R to UN, SL, VN, CN 41.97m: J, 5° dip, PL, R, VN, grey silt | | | | |
| | UW | MS | HQTT | 100 | | 86 | 42.5-42.55m: Fine to coarse SANDSTONE | | | | 100 | | 42.30m: J, 80° dip, UN, SM, T-VN, CN | | | | |
| | UW | MS | HQTT | 100 | | 85 | 42.9m: Unweathered dark grey SILTSTONE, some thin beds of fine to medium SANDSTONE. Weak to moderately strong | | | | | | 43.00m: DD, 0° dip | | | | |
| | UW | MS | HQTT | 100 | | 84 | 43.22m: Unweathered grey fine to medium SANDSTONE, minor thin beds of dark grey SILTSTONE. Weak to moderately strong | | | | | | 43.25m: B, 0° dip, UN, SM, VN, CN 43.50m: DD, 0° dip 43.70m: J, 85° dip, UN, SL to SM, T-VN, CN 43.80m: B, 0° dip, UN, SM, VN, CN 44.00m: DD, 0° dip | | | | |
| | | | | | | | | | | | | 44.60m: DD, 0° dip, Hammer break & 90 deg, UN, SM, T, Calcite | | | | | |

Lugeon Test @ 42.0m (42-45m)

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth 49.5m

Scale 1:25

General Log - 5/04/2019 11:16:52 a.m. - Produced with Core-GS by GeRoc

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH11

SHEET: 10 OF 10

DRILLED BY: Craig & Peter

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 27/03/2018

FINISH DATE: 04/04/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977561.53 mN
 (NZTM2000) 1741185.81 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 129.23m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 43.22m [Cont'd]: Unweathered grey fine to medium SANDSTONE, minor thin beds of dark grey SILTSTONE. Weak to moderately strong | | UW | | | | | 84 | | | | | 45.15m: DD, 0° dip | | | | | | | |
| | 45.65m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | | HQTT | 100 | | 45.5 | | | | 100 | 45.50m: J, 5° dip, UN, SM, VN, CN | | | | | | | |
| | 46.75m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | | HQTT | 100 | | 46.0 | | | | | 46.30m: J, 75° dip, UN, SM, N, CN & Orthog 70, UN, SL, VN, grey silt | | | | | | | |
| | | | UW | | HQTT | 100 | | 46.5 | | | | | 100 | 46.70m: J, 80° dip, UN, SM, N, CN | | | | | | |
| | | UW | | HQTT | 100 | | 47.0 | | | | | | 46.95m: J, 30° dip, UN, SM, VN, CN | | | | | | | |
| | | UW | | HQTT | 100 | | 47.5 | | | | | | 47.85m: J, 45° dip, UN, SM, VN, CN | | | | | | | |
| | | UW | | HQTT | 100 | | 48.0 | | | | | | 48.55m: J, 5° dip, PL, SM, N, CN | | | | | | | |
| | | UW | | HQTT | 100 | | 48.5 | | | | | | 48.60m: J, 90° dip, UN, SM, VN, CN | | | | | | | |
| | | UW | | HQTT | 100 | | 49.0 | | | | | | 48.90m: J, 5° dip, UN, SM, N, CN | | | | | | | |
| | | UW | | HQTT | 100 | | 49.5 | | | | | | 49.00m: J, 10° dip, UN, SM, VN, CN | | | | | | | |
| | 49.5m: Target depth | | UW | | | | | 49.5 | | | | | | | | | | | | |

COMMENTS: 50mm diameter piezometer installed on Fri 6 April 2018. Shear Vane No. 649. Presented shear vane readings have been corrected.

Hole Depth
49.5m

Scale 1:25

BH12 Log

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 1 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
 (NZTM2000) 1740969.47 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering <small>UW MW SW CW US OS SS SW EW</small> | Rock Strength <small>US OS SS SW EW</small> | Sampling Method Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) <small>25 50 75</small> | Water Level | Casing | Installation | Core Box No | |
|-----------------|---|--|--|--------------------------------------|---------|--------|-----------|-------------|--|-----------------------|---------|--|---|-------------|--------|--------------|-------------|--|
| | | | | | | | | | Defect Log <small>2000 600 400 200 20</small> | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Tsoil | 0.0m: Sandy SILT, some roots; brown. Firm, moist, moderate plasticity | | | | | | | | | | | | | | | | | |
| | 0.05m: Silty CLAY; brownish grey. Firm, moist, high plasticity | | | | | | | | | | | | | | | | | |
| | 0.3m: CLAY, some silt; light grey mottled orange brown. Firm, moist, high plasticity | | | | | | | | | | | | | | | | | |
| | 1.3m: No recovery (core loss) | | | | | | | | | | | | | | | | | |
| Residual Soil | 1.5m: CLAY, some silt; light grey mottled orange brown. Firm, moist, high plasticity | | | | | | | | | | | | | | | | | |
| | 2.45m: Silty CLAY, trace gravel; red and brown. Firm, moist, high plasticity. Gravel, fine, angular | | | | | | | | | | | | | | | | | |
| | 2.70m: Becomes silty CLAY, some fine sand, trace gravel; dark reddish brown. Gravel, fine, angular | | | | | | | | | | | | | | | | | |
| | 2.85m: No Recovery (core loss) | | | | | | | | | | | | | | | | | |
| | 3.0m: Silty CLAY, some fine sand, trace gravel; dark reddish brown. Firm, moist, high plasticity. Gravel, fine, angular 3.30m: Orange brown. Wet | | | | | | | | | | | | | | | | | |
| | 3.9m: Sandy SILT, some clay; light pink mottled light grey. Soft to firm, moist, low to moderate plasticity. Sand, fine | | | | | | | | | | | | | | | | | |
| | 4.45m: Sandy SILT, minor gravel; reddish grey. Soft to firm, moist, low plasticity. Sand, fine. Gravel, fine to medium, sub angular | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

Box 1, 0.0-3.0m



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 2 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
(NZTM2000) 1740969.47 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|--|--------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| CW Pakiri | 5.0m: Silty fine SAND, minor organics; light brown, minor black clasts. Loose, moist | | | | HQTT | 90 | | 101 | 5.5 | | | | | | | | | | |
| | 5.9m: No recovery (core loss) | | | | | | | | | | | | | | | | | | |
| | 6.0m: Silty fine SAND, minor organics; light brown, minor black clasts. Loose, moist | | | | SPT | 100 | 1/1 1/1 2/2 N=6 | | 6.0 | | | | | | | | | | |
| | 6.45m: Silty fine SAND, trace gravel; light brown. Loose, moist. Gravel, black, fine, sub angular | | | | HQTT | 100 | | 100 | 6.5 | | | | | | | | | | |
| | 7.85m: No recovery (core loss) | | | | | | | | | | | | | | | | | | |
| | 7.95m: Silty fine SAND, trace gravel; light brown. Loose, moist. Gravel, black, fine, sub angular | | | | SPT | 77 | 1/1 1/1 2/2 N=6 | 99 | 7.5 | | | | | | | | | | |
| | 8.2m: Silty fine SAND, trace gravel; light brown stained orange brown. Loose, moist. Gravel, black, fine, sub angular | | | | HQTT | 95 | | 98 | 8.5 | | | | | | | | | | |
| | 8.8m: Sandy CLAY, some silt; light brown stained orange brown. Firm, moist, moderate to high plasticity 8.95 - 9.00m: Silty CLAY. Soft to firm, high plasticity | | | | SPT | 100 | 42/16 kPa 5/10 16/8 9/17 N>=50 | | 9.0 | | | | | | | | | | |
| UW Pakiri | 9.0m: Silty fine SAND, trace gravel; light brown stained orange brown. Loose, moist. Gravel, black, fine, sub angular | | | | | | | 97 | 9.5 | | | | | | | | | | |
| | 9.5m: Unweathered, grey, interbedded, fine SANDSTONE with very closely spaced, thinly laminated SILTSTONE. Weak | | | | | | | | 9.5 | | | | | | | | | | |

9.00 - 9.50m: SZ, Possible shear zone, polished defect surfaces in SPT core

9.85m: J, 10° dip, PL, SM, VN, CN

Box 2, 3.0-6.5m

Box 3, 6.5-9.9m

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth 33m

Scale 1:25

General Log - 5/04/2019 11:16:54 a.m. - Produced with Core-GS by GeRoc

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 3 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
 (NZTM2000) 1740969.47 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|--|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 9.5m [Cont'd]: Unweathered, grey, interbedded, fine SANDSTONE with very closely spaced, thinly laminated SILTSTONE. Weak | | UW | CS | HQTT | 90 | | 96 | 10.03 - 10.06m: BZ 10.03m: J, 10° UN, SM, VN, CN 10.10m: J, 10° UN, SM, VN, CN 10.15m: J, 15° dip, UN, SM, N, CN 10.23m: J, 15° dip, UN, SM, N, CN 10.34m: J, 10° dip, UN, SM, N, CN 10.66m: J, 10° dip, UN, SM, N, CN 10.74 - 10.90m: BZ | 60 | | | | | | | | | |
| | 11.6m: Unweathered, grey, fine SANDSTONE. Weak | | UW | CS | HQTT | 100 | | 95 | 10.95m: J, 15° dip, UN, SM, VN, CN 11.03m: J, 15° dip, UN, SM, VN, CN 11.13 - 11.20m: BZ 11.30m: J, 10° dip, UN, SM, VN, N, CN 11.40m: J, 10° dip, UN, SM, VN, N, CN 11.50m: J, 10° dip, UN, SM, VN, FeSt | 42 | | | | | | | | | |
| | 12.8m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | UW | CS | HQTT | 100 | | 94 | 11.85m: J, 10° dip, UN, SM, VN, CN 12.00 - 12.35m: BZ 12.35 - 12.70m: J, 80° dip, UN, SM, VN, CN 12.70m: J, 20° dip, UN, SM, VN, CN 12.80m: J, 20° dip, UN, SM, VN, CN 12.90m: J, 10° dip, UN, SM, VN, CN | 34 | | | | | | | | | |
| | 13.20 - 13.50m: Minor dark grey fine gravel size clasts | | UW | CS | HQTT | 100 | | 93 | 13.20m: J, 60° dip, UN, R, VN, CN 13.45m: J, 10° dip, UN, SM, VN, CN | | | | | | | | | | |
| | 13.5m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse SAND matrix. Matrix supported. Weak | | UW | CS | HQTT | 100 | | 92 | 14.05m: J, 45° dip, UN, SM, VN, CN | 96 | | | | | | | | | |
| | 14.4m: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | CS | HQTT | 100 | | 92 | 14.65m: J, 10° dip, UN, SM, VN, CN 14.90m: J, 10° dip, UN, SM, VN, CN | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 4 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
 (NZTM2000) 1740969.47 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
| UW Pakiri | 14.4m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong 15.12 - 15.15m: Some fine to medium gravel size clasts 15.20 - 15.21m: Some fine gravel size clasts | | UW | | HQTT | 100 | | 91 | 15.5 | | | 90 | | | | | | | Box 5, 12.8-15.3m | |
| | 15.9m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse SAND matrix. Matrix supported. Weak | | UW | | | | | 16.0 | | | | | | | | | | | | |
| | 16.4m: Unweathered, grey, fine SANDSTONE. Weak | | UW | | HQTT | 100 | | 90 | 16.5 | | | 100 | | | | | | | | |
| | | | UW | | HQTT | 100 | | 89 | 17.5 | | | 100 | | | | | | | | |
| | | | UW | | HQTT | 100 | | 88 | 18.0 | | | 90 | | | | | | | | |
| | | | UW | | HQTT | 100 | | 87 | 18.5 | | | 90 | | | | | | | | |
| | | | UW | | HQTT | 100 | | 87 | 19.5 | | | 93 | | | | | | | | |
| | 19.75m: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse SAND matrix. Matrix supported. Weak | | UW | | | | | | | | | | | | | | | | | |

18/05/2018, 2:10pm 17.37m

Box 6, 15.3-18.3m

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 5 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
 (NZTM2000) 1740969.47 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|---------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------------|------|------|------|------|------|------|------|--|------|-----|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | | | | | | | |
| UW Pakiri | 19.75m [Cont'd]: Unweathered, grey, CONGLOMERATE. Conglomerate is fine to medium gravel in fine to coarse SAND matrix. Matrix supported. Weak | | UW | MS | HQTT | 96 | | 86 | 20.5 | [Graphic Log] | 2000 | 600 | 200 | 93 | | | | | Box 7, 18.3-21.0m | | | | | | | | | | |
| | 20.3m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | 20.5 | 21.0 | 21.5 | 22.0 | 22.5 | 23.0 | 23.5 | 24.0 | 24.5 | 100 |
| | 22.15m: Unweathered, grey, interbedded, fine SANDSTONE and dark grey, closely-very closely spaced, thinly to moderately thin SILTSTONE. Weak | | | | | | | | | | | | | | | | | | | 22.5 | 23.0 | 23.5 | 24.0 | 24.5 | 96 | 100 | 23.55m: J, 10° dip, UN, SM, VN, CN 23.56m: J, 10° dip, UN, SM, VN, CN | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

Rev: A

BOREHOLE LOG

BOREHOLE No.:
BH12

SHEET: 6 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
(NZTM2000) 1740969.47 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
| UW Pakiri | 22.15m [Cont'd]: Unweathered, grey, interbedded, fine SANDSTONE and dark grey, closely-very closely spaced, thinly to moderately thin SILTSTONE. Weak | | UW | | HQTT | 100 | | 81 | 25.5 | | | 100 | | | | | | | |
| | | | UW | | HQTT | 100 | | 80 | 26.0 | | | 96 | 26.37m: J, 10° dip, PL, SM, VN, CN 26.39m: J, 10° dip, PL, SM, VN, CN 26.55m: J, 10° dip, PL, SM, VN, CN | | | | | | |
| | | | UW | | HQTT | 100 | | 79 | 27.0 | | | 100 | 27.27m: J, 65° dip, UN, R, VN, CN 27.46m: J, 15° dip, UN, SM, VN, CN | | | | | | |
| | 27.85m: Unweathered, grey, fine SANDSTONE. Weak | | UW | | HQTT | 100 | | 78 | 27.5 | | | 100 | | | | | | | |
| | | | UW | | HQTT | 100 | | 77 | 28.0 | | | 100 | | | | | | | |
| | | | UW | | HQTT | 100 | | 77 | 28.5 | | | 100 | | | | | | | |
| | | | UW | | HQTT | 100 | | 77 | 29.0 | | | 100 | | | | | | | |
| | | | UW | | HQTT | 100 | | 77 | 29.5 | | | 100 | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

Rev.: A

General Log - 5/04/2019 11:16:54 a.m. - Produced with Core-GS by GeRoc

Box 9, 23.9-26.7m

Box 10, 26.7-29.5m

BOREHOLE LOG

BOREHOLE No.:

BH12

SHEET: 7 OF 7

DRILLED BY: Malcolm and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 13/03/2018

FINISH DATE: 20/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977250.56 mN
 (NZTM2000) 1740969.47 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 106.44m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|-----------------------|---------|--|----------------|-------------|--------|--------------|-------------|
| | | | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| UW Pakiri | 27.85m [Cont'd]: Unweathered, grey, fine SANDSTONE. Weak | | UW | US | HQTT | 100 | | 76 | 30.5 | | | | | | | | | | |
| | 30.35m: Unweathered, grey, fine to coarse SANDSTONE with minor fine to medium gravel size clasts. Weak | | UW | US | HQTT | 100 | | 75 | 31.0 | | | | | 30.95m: J, 85° dip, PL, SM, VN, CN 31.18m: J, 60° dip, UN, SM, VN, CN | | | | | |
| | 30.95m: Unweathered, grey, fine SANDSTONE. Weak | | UW | US | HQTT | 100 | | 74 | 31.5 | | | | | 31.87m: J, 15° dip, UN, SM, VN, CN 32.00m: J, 65° dip, UN, SM, VN, CN | | | | | |
| | 33m: END OF BOREHOLE | | | | | | | 73 | 33.0 | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 2204. Presented shear vane readings have been corrected

Hole Depth
33m

Scale 1:25

BH13 Log

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 1 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|-------------------------------|--|---|-----------------|---------------|-----------------|-------------------|--------------------------|--------------------------|-----------|-------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Residual Soil | 0.0m: No recovery (core loss - tree stump) | | | | | | | 60 | | | | | | | | | | | | |
| | 0.6m: Silty CLAY, some rootlets; brown. Firm, moist, moderate plasticity. | | | | HQTT | 60 | | | 59 | | | | | | | | | | | |
| | 0.7m: Silty CLAY, trace rootlets; orange brown. Firm, moist, high plasticity | | | | | | | | | | | | | | | | | | | |
| | 1.30m: grades reddish brown. | | | | | | | | | | | | | | | | | | | |
| | 1.4m: Clayey SILT, trace fine sand; reddish brown. Firm, moist, high plasticity | | | | SPT | 100 | ● 30/6 kPa | 1/0 1/0 1/1 N=3 | | | | | | | | | | | | |
| | 1.95m: Silty, fine SAND, with minor gravel; light brown. Loose, moist. Gravel, fine, angular | | | | HQTT | 95 | | | 58 | | | | | | | | | | | |
| | 3.0m: No recovery (core loss) | | | | HQTT | 0 | | 2/1 2/1 1/0 N=4 | 57 | | | | | | | | | | | |
| | 3.45m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 3.65m: Silty, fine SAND, some gravel; brown. Loose, moist. Gravel, fine to medium, angular | | | | HQTT | 85 | | | 56 | | | | | | | | | | | |
| | 4.4m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| 4.5m: No recovery (core loss) | | | | SPT | 0 | | 1/2 1/1 1/1 N=4 | 4.5 | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

Box 1.0.0-4.3m

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 2 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | |
|--|---|---|-----------------|---------------|-----------------|--------------------------|---|--------|-----------|-------------|--------------|-----------------------|---|--|----------------|-------------|--------|--------------|-------------|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | |
| Residual Soil | 5.0m: No recovery (core loss) | | | | | | | 55 | | | | | | | | | | | | |
| | 5.3m: Silty, fine SAND, some gravel; brown. Loose, moist. Gravel, fine to medium, angular | | | | HQTT | 67 | | 5.5 | | | | | | | | | | | | |
| | 5.45m: Silty, fine SAND, minor gravel; light brown. Loose, moist. Gravel, fine, angular | | | | | | | | | | | | | | | | | | | |
| | 5.55m-5.65m: Black staining | | | | | | | | | | | | | | | | | | | |
| | 5.65m: Silty, fine SAND, minor gravel; light brown. Loose, moist. Gravel, fine, angular | | | | | | | | | | | | | | | | | | | |
| | 6.0m: No recovery (core loss) | | | | SPT | 100 | 2/1 1/2 2/2 N=7 | 6.0 | | | | | | | | | | | | |
| | 6.5m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| | 6.85m: Gravelly SAND, some silt; grey and brown. Loose, moist. Gravel, fine to medium, angular | | | | HQTT | 66 | | 7.0 | | | | | | | | | | | | |
| | 7.0m: Silty SAND, some gravel; brown. Loose, moist. Gravel, fine to medium, angular | | | | | | | | | | | | | | | | | | | |
| | 7.2m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | |
| 7.5m: Silty SAND, some gravel; brown. Loose, moist. Gravel, fine to medium, angular | | | | SPT | 66 | 0/1 1/1 1/2 N=5 | 7.5 | | | | | | | | | | | | | |
| 7.8m: No recovery (core loss) | | | | | | | | | | | | | | | | | | | | |
| 7.95m: Silty SAND, minor gravel; light brown. Loose, moist. Gravel, fine, angular | | | | | | | | | | | | | | | | | | | | |
| 8.15m: Clayey SILT, minor fine sand; light brown. Soft to firm, moist, moderate to high plasticity | | | | | | | | | | | | | | | | | | | | |
| CW Pakiri | 8.3m: Sandy SILT; brown and grey stained orange. Very stiff, moist, low plasticity, Sand, fine | | | | HQTT | 100 | | 8.5 | | | | | | | | | | | | |
| | 8.45 - 8.55m: CLAY, minor silt; orange brown. Hard, moist, moderate plasticity | | | | | | | | | | | | | | | | | | | |
| 8.55 - 8.75m: Sandy SILT; grey becoming light brown from 8.7m. Sand, fine | | | | | | | | | | | | | | | | | | | | |
| HW Pakiri | 8.75m: Highly weathered, orange brown, fine SANDSTONE. Extremely weak, thinly laminated, sub-horizontal bedding | | | | | | | | | | | | | 8.75m: J, Polished surface, clay veneer | | | | | | |
| | 8.85m: Highly weathered, brown, fine to medium SANDSTONE. Very weak | | | | SPT | 100 | 7/12 15/22 13 for 35mm N>=50 | 9.0 | | | | | | | | | | | | |
| | 8.9m: grades to light greyish brown. Very weak to weak | | | | | | | | | | | | | | | | | | | |
| SW-MW Pakiri | 9.35m: Silty CLAY with some gravel; dark orange brown with blackish grey staining. Firm, moist, high plasticity [possible shear zone] | | | | | | | | | | | | | 9.35 - 9.55m: SZ, Possible shear zone. No observed polished surfaces | | | | | | |
| | 9.55m: Slightly weathered to moderately weathered, grey and brown, fine SANDSTONE. Weak to very weak | | | | HQTT | 100 | | 9.5 | | | | | | 9.55m: J, 15° dip, UN, SM, W, FeSt | | | | | | |
| | | | | | | | | | | | | | 9.70 - 10.00m: J, 10° dip, PL, R, W, FeSt | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

Box 2, 4.3-5.6m

96mm

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 3 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|--------------|---|---------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | |
| SW-MW Pakiri | 10.0m: Slightly weathered to moderately weathered, grey and brown, fine SANDSTONE. Weak to very weak | 10.25 - 10.35m: Moderately weathered, brown | UW | MS | HQTT | 100 | | 50 | | | 27 | 10.15m: J, 25° dip, UN, R, W, FeSt 10.25 - 10.35m: J, 10° dip, PL, SM, W, FeSt 10.35 - 10.50m: SZ, Defects are polished | | | | | | |
| HW Pakiri | 10.35m: Highly weathered, orange brown, fine SANDSTONE. Extremely weak. Sub-horizontal, laminated bedding [possible basal landslide shear zone] | | US | MS | | | | 10.5 | | | | 10.50m: J, 10° dip, PL, SM, W, CN | | | | | | |
| SW-MW Pakiri | 10.5m: Slightly weathered, grey, fine SANDSTONE. Weak | 10.50 - 10.60m: thinly laminated carbonaceous beds | UW | MS | HQTT | 100 | | 49 | | | 67 | 10.70m: J, 30° dip, UN, SM, W, CN 11.25m: J, 20° dip, UN, R, W, N, FeSt | | | | | | |
| SW-MW Pakiri | 12.9m: Moderately weathered, brown with reddish brown staining, fine SANDSTONE. Very weak | | UW | MS | HQTT | 100 | | 48 | | | 55 | 11.65m: J, 20° dip, PL, SM, W, N, FeSt 11.90m: Very thin carbonaceous layer 11.90m: J, 10° dip, PL, SM, W, N, CN 12.15m: J, 25° dip, UN, SM, W, N, FeSt 12.25m: J, 30° dip, UN, SM, W, N, CN 12.50m: J, 65° dip, UN, R, W, FeSt 12.70m: 50% of core highly fractured 12.70m: J, 70° dip, UN, R, W, N, FeSt | | | | | | |
| SW Pakiri | 13.2m: Slightly weathered, grey carbonaceous fine SANDSTONE. Very weak to weak | | UW | MS | HQTT | 100 | | 47 | | | 81 | 13.00m: J, 85° dip, UN, SM, W, N, FeSt, closed joint 13.25m: J, 85° dip, UN, SM, W, MN, CG 13.40 - 13.50m: Broken zone | | | | | | |
| SW Pakiri | 13.4m: Moderately weathered, orange brown and reddish brown, fine SANDSTONE. Very weak | | UW | MS | HQTT | 100 | | 46 | | | 81 | 13.65m: J, 55° dip, UN, SM, W, N, CG 13.75m: J, 75° dip, UN, SM, W, N, CN 13.95m: J, 20° dip, UN, SM, W, N, CN 14.20m: J, 30° dip, UN, SM, W, N, CN | | | | | | |
| SW Pakiri | 13.7m: Slightly weathered, fine to medium SANDSTONE. Very weak | 14.10m: grading to fine to coarse grained, with gravel siltstone clasts. | UW | MS | HQTT | 100 | | 46 | | | 81 | 14.65m: J, 85° dip, UN, R, W, N, CN | | | | | | |
| SW Pakiri | 14.7m: Slightly weathered, grey, fine to medium SANDSTONE. Weak | | UW | MS | HQTT | 100 | | 46 | | | 81 | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 4 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|-----------------|----------------|-----------------|-------------------|---------|--------|-------------------------|---------------------------------|---------------------------------|-----------------------|--|---------------------------------------|----------------|-------------|--------|--------------|-------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | |
| UW Pakiri | 15.0m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | UW MN CN | US MS EW | HQTT | 100 | | 45 | 15.0 | [Yellow dotted pattern] | 2000 600 200 200 20 | 53 | 15.20m: J, 25° dip, UN, SM, W, N, CN | 25 50 75 | | | | | Box 5, 14.0-16.5m | | | | | | | | | |
| | 15.15m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | 15.32m: J, 20° dip, UN, SM, W, MN, FeSt | | | | | | | 15.50m: J, 20° dip, UN, SM, W, N, CN | 15.60m: J, 20° dip, UN, SM, W, N, CN | | | | | | | |
| | | | | | | | | | | | | | 15.85m: J, 35° dip, UN, SM, W, N, CN | | | | | | | 15.90m: J, 5° dip, PL, SM, W, VN, CN | 16.05m: J, 10° dip, UN, SM, W, VN, CN | 16.15m: J, 30° dip, UN, SM, W, MN, CN | 16.30m: J, 10° dip, UN, SM, W, VN, CN | 16.40m: J, 10° dip, PL, SM, W, VN, CN | 16.45m: J, 20° dip, UN, SM, W, MN, CN | 16.50m: J, 35° dip, UN, SM, W, MN, CN | 16.70m: J, 15° dip, UN, SM, W, N, CN | 16.93m: J, 15° dip, UN, SM, W, MN, CN |
| | | | | | | | | | | | | | 17.15m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | 17.30m: J, 80° dip, UN, SM, W, N, CN | 17.50 - 17.65m: Broken zone | | 17.85m: J, 5° dip, PL, SM, W, VN, CN | | | | | |
| | | | | | | | | | | | | | 18.60m: J, 10° dip, PL, SL, W, VN, CN | | | | | | | 18.65 - 18.85m: Broken zone | | 19.00 - 19.20m: Broken zone | | | | | | |
| | | | | | | | | | | | | | 19.50m: J, 20° dip, UN, SM, W, MN, CN | | | | | | | 19.60m: J, 35° dip, UN, SM, W, MN, CN | | | | | | | | |
| 18.3m: Unweathered, dark grey SILTSTONE. Very weak | | UW MN CN | US MS EW | HQTT | 100 | | 44 | 18.0 | [Yellow dotted pattern] | 2000 600 200 200 20 | 74 | 24 | 18.3m: Unweathered, dark grey SILTSTONE. Very weak | | 25 50 75 | | | | Box 6, 16.5-19.3m | | | | | | | | | |
| 19.0m: Grades to unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | | | | | | 19.00 - 19.20m: Broken zone | | | | | | | | | | | | | | | |
| 19.3m: Unweathered, dark grey, SILTSTONE. Very weak | | | | | | | | | | | | | 19.50m: J, 20° dip, UN, SM, W, MN, CN | | | | | | | 19.60m: J, 35° dip, UN, SM, W, MN, CN | | | | | | | | |
| 19.45m: Unweathered, grey, fine SANDSTONE, with thin (20mm) layers of dark grey, SILTSTONE. Weak | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25



Tonkin+Taylor

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 5 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
(NZTM2000) 1740471.80 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|---|-----------------|---------------|-----------------|-------------------|---------|--------|---|---------------|--------------|-----------------------|---------|---------------------------------------|----------------|-------------|--------|--------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| UW Pakiri | 19.9-23.15m: Unweathered, grey, SANDSTONE, interbedded with 20mm-60mm thick beds of dark grey, SILTSTONE. Weak | | UW | S | HQTT | 100 | | 40 | 20.05 | [Graphic Log] | 2000 | 600 | 20 | 20.05m: J, 10° dip, PL, SM, W, MN, CN | 25 | | | | |
| | | 20.30m: J, 10° dip, PL, SM, W, MN, CN | | | | | | | | | | | | 86 | | | | | |
| | | | | | HQTT | 100 | | 21.0 | 21.00 | | | | | 20.85m: J, 25° dip, UN, R, W, MN, CN | | | | | |
| | | | | | HQTT | 100 | | 39 | 21.00 | | | | | 21.00m: J, 15° dip, UN, SM, W, MN, CN | | | | | |
| | | | | | HQTT | 100 | | 21.5 | 21.40 | | | | | 21.40m: J, 30° dip, ST, SM, W, MN, CN | | | | | |
| | | | | | HQTT | 100 | | 22.0 | 21.55m: J, 25° dip, UN, SM, W, N, CN | | | | | 21.75m: J, 15° dip, UN, R, W, MN, CN | | | | | |
| | | | | | HQTT | 100 | | 22.5 | 22.35m: J, 10° dip, UN, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 23.0 | 22.92m: J, 20° dip, ST, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 37 | 22.98m: J, 10° dip, UN, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 23.5 | 23.00 - 24.00m: Broken zone | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.0 | 23.55m: J, 40° dip, UN, SM-R, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.00 - 24.10m: Broken zone | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.20m: J, 15° dip, PL, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.30m: J, 10° dip, PL, R, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.52m: J, 40° dip, UN, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.90m: J, 20° dip, PL, SM, W, MN, CN | | | | | | | | | | |
| | | | | | HQTT | 100 | | 24.5 | 24.95m: J, 20° dip, PL, SM, W, MN, CN | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

Box 7, 19.9-22.0m

Box 8, 22.0-24.7m

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 6 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|---|---|---|-----------------|----------------|-----------------|-------------------|---------|--------|-----------|-------------------------|---------------------------------------|-----------------------|--|---------------------------------------|----------------|-------------|----------------|---------------|-------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| UW Pakiri | 23.15m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Weak | | UW MN CN | US MS EW | HQTT | 100 | | 35 | 25.10 | [Yellow dotted pattern] | 2000 600 200 100 50 20 | 68 | 25.10m: J, 10° dip, UN, SM, W, MN, CN | 25 | 18/06/2018 | [Casing] | [Installation] | [Core Box No] | |
| | 25.3m: Unweathered, dark grey SILTSTONE. Weak | | | | | | | | | | | | 25.35 - 25.50m: Crushed zone | | | | | | |
| | 25.5m: Unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | | | | | 25.55 - 25.92m: Multiple fractures generally J's orientated at 40° | | | | | | |
| | | | | | | | | | | | | | 26.20m: J, 10° dip, PL, SM, W, MN, CN | | | | | | |
| | | | | | | | | | | | | | 26.20 - 26.25m: Broken zone | | | | | | |
| | | | | | | | | | | | | | 26.42m: J, 15° dip, PL, SM, W, MN, CN | | | | | | |
| | | | | | | | | | | | | | 26.62m: J, 15° dip, UN, SM, W, MN, CN | | | | | | |
| | | | | | | | | | | | | | 26.77m: J, 35° dip, UN, SM, W, MN, CN | | | | | | |
| | | | | | | | | | | | | | 27.07m: J, 10° dip, PL, SM, W, MN, CG | | | | | | |
| | | | | | | | | | | | | | 27.12m: J, 10° dip, UN, SM, W, MN, CN | | | | | | |
| | | 27.32m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 27.40m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 27.60m: J, 40° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 27.85m: J, 10° dip, PL, SM, W, N, CN | | | | | | | | | | | | | | | | | |
| | | 28.40m: Broken zone | | | | | | | | | | | | | | | | | |
| 28.3m: Unweathered, dark grey, SILTSTONE. Weak | | 28.50m: J, 15° dip, PL, SL, W, N, CN | | | | | | | | | | | | | | | | | |
| 28.55m: Unweathered, grey, fine SANDSTONE. Weak | | 28.60m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 28.75m: J, 15° dip, PL, R, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.03m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.10m: J, 15° dip, UN, SM, W, MN, CG | | | | | | | | | | | | | | | | | |
| | | 29.25m: J, 10° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.70m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.78m: J, 10° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.80m: J, 10° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| | | 29.90m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | | | | | | | | | | | |
| 29.15m: Unweathered, dark grey SILTSTONE. Weak | | 29.5 | 31 | 44 | | | | | | | | | | | | | | | |
| 29.4m: Unweathered, grey, fine SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH13

SHEET: 7 OF 7

DRILLED BY: Paul and Jaz

LOGGED BY: OPRI

CHECKED: ALNA

START DATE: 28/02/2018

FINISH DATE: 07/03/2018

CONTRACTOR: McMillan Drilling

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977169.67 mN
 (NZTM2000) 1740471.80 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 60.12m
 R.L. COLLAR:
 DATUM: NZVD2016
 SURVEY: Total Station Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|---|---|--|----------------------------------|-----------------|-------------------|---------|--------|-----------|----------------------|--------------|--|---------|---------------------------------------|----------------|-------------|--------|--------------|--------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | |
| UW Pakiri | 29.4m [Cont'd]: Unweathered, grey, fine SANDSTONE. Weak | | UW MW SW CW US MS SS ES EW EW | US MS SS ES EW EW | HQTT | 100 | | 30 | 30 | [Yellow shaded area] | 2000 | 600 | 200 | 30.10m: J, 10° dip, UN, SM, W, MN, CG | 25 | | | | Box 11, 29.8-32.3m |
| | 30.55m: Unweathered, grey, fine to coarse SANDSTONE. Weak | | | | | | | | | | 58 | 30.12 - 30.32m: Broken zone | | | | | | | |
| | 31.0m: Unweathered, grey, fine to medium SANDSTONE. Weak | | | | | | | | | | 41 | 30.48m: Laminated carbonaceous layer 30.59m: J, 30° dip, UN, SM, W, MN, CN 30.62m: J, 30° dip, UN, SM, W, MN, CN 30.83m: J, 20° dip, UN, SM, W, MN, CN 30.96m: J, 15° dip, UN, SM, W, MN, CN 31.11m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | |
| | 34.99m: END OF BOREHOLE | | | | | | | | | | 0 | 31.23 - 31.42m: Broken zone 32.15m: J, 65° dip, UN, SM, W, MN, CN 32.34m: J, 10° dip, PL, SM, W, MN, CN 32.61m: J, 15° dip, PL, SM, W, MN, CN 32.82m: J, 32° dip, UN, SM, W, MN, CN 32.90 - 33.10m: Broken zone 33.17m: J, 35° dip, UN, SM, W, MN, CN 33.30 - 33.45m: Broken zone 33.55m: J, 35° dip, UN, SM, W, MN, CN 34.20 - 34.25m: Broken zone 34.30m: J, 25° dip, UN, SM, W, MN, CN 34.50m: J, 25° dip, UN, SM, W, MN, CN 34.60 - 34.70m: Broken zone 34.80m: J, 15° dip, UN, SM, W, MN, CN | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No 2204. Presented shear vane readings have been corrected

Hole Depth
34.99m

Scale 1:25

BH14 Log

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 1 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
 (NZTM2000) 1739925.24 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
 R.L. COLLAR: 28.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|--|----------------|-------------|--------|--------------|-------------|
| | Soil: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | |
| Tsoil | 0.0m: SILT, some fine sand, some roots; brown. Firm, saturated, low plasticity | | | | | | | | | | | | | | | | | | |
| | 0.2m: SILT, some clay, trace fine sand, trace rootlets, trace pockets of silty fine sand; brown mottled orange brown and reddish brown. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | |
| | 0.5m: Sandy SILT, some pockets of silty fine SAND; brown mottled orange brown and reddish brown. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | |
| | 0.68m: Clayey SILT; orange brown mottled pink | | | | | | | | | | | | | | | | | | |
| | 0.8m: Sandy SILT, some pockets of silty fine to medium SAND; brown mottled orange brown and reddish brown. Stiff, wet, low plasticity. | | | | | | | | | | | | | | | | | | |
| | 1.1m: SILT, minor fine sand, trace rootlets; brown, minor orange brown and grey mottles. Stiff, wet, low plasticity | | | | | | | | | | | | | | | | | | |
| | 1.3m: No recovery (core loss) | | | | | | | | | | | | | | | | | | |
| | 1.5m-2.0m: Push Tube | | | | | | | | | | | | | | | | | | |
| | 2.5m: Silty CLAY, minor fine sand; bluish grey. Firm, wet, moderate to high plasticity 2.75m: Saturated | | | | | | | | | | | | | | | | | | |
| | 2.50m: Becoming Sandy silty CLAY. Sand, fine | | | | | | | | | | | | | | | | | | |
| Residual Soil | 3.0m-3.5m: Push Tube attempted (No recovery) | | | | | | | | | | | | | | | | | | |
| | 3.5m: Clayey SILT, some fine sand; grey. Firm, saturated, low plasticity | | | | | | | | | | | | | | | | | | |
| | 3.6m: Becoming sandy SILT, minor clay; brown, Firm, saturated, low plasticity. Sand, fine | | | | | | | | | | | | | | | | | | |
| | 4.0m: Sandy SILT; grey. Firm, saturated, low plasticity. Sand, fine | | | | | | | | | | | | | | | | | | |
| | 4.5m: Sandy SILT; grey. Firm, saturated, low plasticity. Sand, fine | | | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth
26.8m

Scale 1:25

Box 1, 0.0-4.0m

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 2 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
 (NZTM2000) 1739925.24 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
 R.L. COLLAR: 28.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | | | | | | | | | ROCK DEFECTS | | | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No |
|-----------------|--|-----------------|---------------|-----------------|-------------------|--------------------------|--------|-----------|-------------|------------|-----------------------|---------|---------------------------------------|--|--|----------------|-------------|--------|--------------|-------------|
| | Soil Classification, colour, consistency / density, moisture, plasticity | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | |
| Residual Soil | 5.0m: Sandy SILT; grey. Firm, saturated, low plasticity. Sand, fine | | | HQTT | 100 | | 5.5 | | | | | | | | | | | | | |
| | 6.3m: Silty CLAY, some pockets of sandy silt; grey. Firm, wet, moderate to high plasticity | | | SPT | 100 | 0/0 0/0 0/0 N=0 | 6.0 | | | | | | | | | | | | | |
| | 7.5-8.0m: Push Tube | | | PT | 100 | 44/8 kPa | 7.5 | | | | | | | | | | | | | |
| | 8.0m: Silty CLAY, minor fine sand; grey. Firm, wet, moderate plasticity | | | SPT | 100 | 0/0 0/0 0/0 N=0 | 8.0 | | | | | | | | | | | | | |
| | 8.1m: Sandy SILT, minor clay; grey. Firm, wet, low plasticity. Sand, fine | | | | | | 8.5 | | | | | | | | | | | | | |
| | 8.55m: No recovery (core loss) | | | HQTT | 18 | | 8.5 | | | | | | | | | | | | | |
| | 9.0m: Sandy SILT; grey. Firm, wet, low plasticity. Sand, fine | | | SPT | 100 | 0/0 1/1 2/1 N=5 | 9.0 | | | | | | | | | | | | | |
| | 9.3m: Silty fine to medium SAND; grey. Loose, wet | | | | | | 9.5 | | | | | | | | | | | | | |
| | 9.6m: Sandy SILT; grey. Firm, wet, low plasticity. Sand, fine to medium | | | | | | 9.6 | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth
26.8m

Scale 1:25

Box 2, 4.0-6.5m

Box 3, 6.5-10.0m

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 3 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
 (NZTM2000) 1739925.24 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
 R.L. COLLAR: 28.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | | | | | | | | | | | | |
|---|---|---|-----------------|---------------|-----------------|--|--------------------------------------|--------|-------------------------|--|--------------|-----------------------|---|---------------------------------------|----------------|-------------|--------|--------------|-------------|-----|------|--|-------------------------|-------------------------|-------------------------|-----|--|---|------|-----|------|------|-------------------------|-----|----|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Defect Log | Fracture Spacing (mm) | RQD (%) | | | | | | | | | | | | | | | | | | | | | | | |
| Residual Soil | 10.0m: Sandy SILT; grey. Firm, wet, low plasticity. Sand, fine | | UW | MS | HQTT | 100 | 19/6 kPa 0/0 0/1 1/2 N=4 | 10.5 | 10.5 | [Yellow with asterisks] | 2000 | 500 | 200 | 20 | | | | | | | | | | | | | | | | | | | | | | |
| | 10.5m: Silty fine SAND; dark grey. Loose, wet | | | | | | | | | | | | | | | | | | | SPT | 100 | 36/11 kPa 0/1 2/2 4/5 N=13 | 11.0 | 11.0 | [Yellow with asterisks] | 500 | 200 | 20 | | | | | | | | |
| | 10.8m: SILT, minor to some fine to medium sand; grey. Firm, wet, low plasticity | | | | | | | | | | | | | | | | | | | | | | | | | | | | HQTT | 100 | 11.5 | 11.5 | [Yellow with asterisks] | 200 | 20 | |
| 11.20 - 11.30m: Brown staining and trace decomposing wood fragments | | UW/Pakiri | MS | HQTT | 100 | 36/11 kPa 0/1 2/2 4/5 N=13 | 12.0 | 12.0 | [Yellow with asterisks] | 500 | 200 | 20 | 12.64 - 12.68m: J, 30° dip, UN, SM to R, VN, CN | 55 | | | | | | | | | | | | | | | | | | | | | | |
| 12.55m: Unweathered, interbedded grey, SILTSTONE and fine SANDSTONE. Weak | | | | | | | | | | | | | | | | | | | | SPT | 100 | 13.0 | 13.0 | [Yellow with asterisks] | 500 | 200 | 20 | 12.72m: J, Orthog 70 to 90, UN, R, T, CN to UN, SM, VN, calcite | 55 | | | | | | | |
| 14.6m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | HQTT | 100 | 14.5 | 14.5 | [Yellow with asterisks] | 500 | 200 | 20 | 12.88 - 12.94m: J, 90° dip, UN, SM, VN, grey silt | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 15.0 | 15.0 | [Yellow with asterisks] | 500 | 200 | 20 | 12.94m: BF, 30° dip, UN, SM, VN, calcite | 55 | | | | | | | | |
| | | HQTT | 100 | 15.5 | 15.5 | [Yellow with asterisks] | 500 | 200 | 20 | 13.04 - 13.14m: J, 90° dip, UN, SM, VN, calcite | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 16.0 | 16.0 | [Yellow with asterisks] | 500 | 200 | 20 | 13.04 - 13.30m: B, 30° dip, PL, SM to ST, SM, VN, CN | 55 | | | | | | | | |
| | | HQTT | 100 | 16.5 | 16.5 | [Yellow with asterisks] | 500 | 200 | 20 | 13.45m: J, 25° dip, PL, SL, N, grey silt infill | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 17.0 | 17.0 | [Yellow with asterisks] | 500 | 200 | 20 | 13.47m: J, 70° dip, UN, SL, T-VN, CN | 55 | | | | | | | | |
| | | HQTT | 100 | 17.5 | 17.5 | [Yellow with asterisks] | 500 | 200 | 20 | 13.56m: J, 20° dip, ST, SM, N, Gravelly silt | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 18.0 | 18.0 | [Yellow with asterisks] | 500 | 200 | 20 | 13.59m: J, 30° dip, Wavy, UN, SM, VN, calcite | 55 | | | | | | | | |
| | | HQTT | 100 | 18.5 | 18.5 | [Yellow with asterisks] | 500 | 200 | 20 | 13.66m: J, 20, UN, SL, T-VN, CN | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 19.0 | 19.0 | [Yellow with asterisks] | 500 | 200 | 20 | 13.66 - 13.93m: J, 70° dip, VCS, UN, SM, calcite | 55 | | | | | | | | |
| | | HQTT | 100 | 19.5 | 19.5 | [Yellow with asterisks] | 500 | 200 | 20 | 13.93m: J, 30° dip, UN, R, VN, CN | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 20.0 | 20.0 | [Yellow with asterisks] | 500 | 200 | 20 | 13.98 - 14.00m: J, 20° dip, UN, SL, T-VN, CN | 55 | | | | | | | | |
| | | HQTT | 100 | 20.5 | 20.5 | [Yellow with asterisks] | 500 | 200 | 20 | 14.20 - 14.35m: J, 20 to 90, PL, R to UN, R, T-VN, CN to calcite | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 21.0 | 21.0 | [Yellow with asterisks] | 500 | 200 | 20 | 14.30 - 14.60m: J, 90° dip, & orthog 70-90, UN, SM to R, T-VN, calcite | 55 | | | | | | | | |
| | | HQTT | 100 | 21.5 | 21.5 | [Yellow with asterisks] | 500 | 200 | 20 | 14.60 - 14.70m: BZ, Rec f-c gvl, lower contact is 30, UN, SM, N, silty fine gravel | 55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | HQTT | 100 | 22.0 | 22.0 | [Yellow with asterisks] | 500 | 200 | 20 | 14.85m: J, 10, UN, SL, T-VN, CN | 55 | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth
26.8m

Scale 1:25

Box 4, 10.0-12.5m

Box 5, 12.5-15.0m

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 4 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

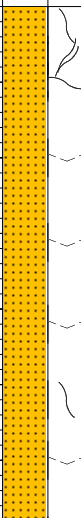
CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
 (NZTM2000) 1739925.24 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
 R.L. COLLAR: 28.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | ROCK DEFECTS | | | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | | | |
|-----------------|---|---|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|---|-----------------------|---------|---|----------------|-------------|--------|--------------|-------------|----|---|----|----|---|----|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity | ROCK: Weathering, colour, fabric, name, strength, cementation | | | | | | | | | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | | | | | | | | | | | |
| UW Pakiri | 14.6m [Cont'd]: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | MS | HQTT | 100 | | 15.5 | 16.0 |  | 2000 | 80 | 15.06m: J, 70° dip, Wavy, UN, SM, T-VN, CN 15.16m: J, -60° dip, UN, R to PL, R, T-VN, CN 15.18m: J, -50° dip, UN, SM, T-VN, CN 15.25m: J, 20° dip, UN, SM, VN to N, trace silty fine sand 15.28 - 15.30m: BZ, Rec f-c gvl, upper contact, orthog 10 to 90, UN, SM to R lower contact 30, UN, SM, trace silt 15.50m: DD, 0° dip 15.78m: DD, 0° dip, Hammer break 16.05m: DD, 0° dip, Hammer break, 0 to 20, UN, SM, T, CN 16.30m: J, 70° dip, Wavy, UN, R, VN, calcite 16.50m: DD, 0° dip | 25 | | | | | | | | | | |
| | 16.75m: Unweathered, interbedded, fine SANDSTONE and SILTSTONE. Weak. Beds are thin (50mm) to moderately thin (160mm) | | | | | | | | | | 500 | | | | | | | | 80 | 16.75m: B, 20° dip, UN, SM, T-VN, CN 16.82m: J, 50° dip, Wavy, UN, SL, T-VN, CN 16.86m: B, 15° dip, UN, SM, VN, Calcite 16.94m: B, 20° dip, UN, SL to ST, SL, VN, calcite 17.13m: B, 20° dip, UN, SL, T-VN, CN 17.25m: B, 20° dip, UN, SL, T-VN, CN 17.35m: B, 20° dip, ST, SM, T-VN, CN 17.52m: B, 20° dip, Wavy, UN, SM, T-VN, CN 17.68m: B, 20° dip, UN, SL, VN, Calcite 17.78m: B, 20° dip, PL, R, T-VN, trace calcite 17.84m: B, 20° dip, PL, R, T-VN, trace calcite 17.94m: B, 20° dip, ST, SL, T-VN, CN 18.00m: J, Orthog 0 to 50, UN, R to PL, SM, T-VN, CN 18.05 - 18.15m: J, 20 to 90, UN, R, T-VN, CN 18.15m: J, 60° dip, UN, R, T-VN, CN 18.20 - 19.08m: B, 20° dip, VCS to CS, UN, SM, T-VN, CN, some calcite | 50 | | | |
| | 18.7m: Unweathered, dark grey SILTSTONE, interbedded with some thin to moderately thin beds of fine and fine to medium SANDSTONE. Weak. | | | | | | | | | | 200 | | | | | | | | | | | 24 | 19.08 - 19.38m: B, 10° dip, to 20, VCS, UN, SL, T-VN, CN, some calcite 19.33m: B, 20° dip, UN, SL, N, gravelly silt 19.50m: J, 15° dip, UN, SM, VN, CN 19.50 - 19.77m: B, 20° dip 19.85m: J, 0° dip, to 25, UN, SL to ST, SM, T-VN, CN to calcite | 75 |
| | 19.85 - 20.05m: Calcite veins, very closely spaced, tight to very narrow, approx 80 deg dip | | | | | | | | | | 20 | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth 26.8m

Scale 1:25

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 5 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
JOB No.: 1005069.1120
LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
(NZTM2000) 1739925.24 mE

DIRECTION: 0°
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
R.L. COLLAR: 28.00m
DATUM: NZVD2016
SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | | | |
|--|--|----|-----------------|---------------|-----------------|-------------------|---------|--------|--|-------------|--|-----------------------|---|---|----------------|-------------|--------|--------------|-------------|--|--|--|--|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | | | |
| UW Pakiri | 20.0m: Unweathered, dark grey SILTSTONE, interbedded with some thin to moderately thin beds of fine and fine to medium SANDSTONE. Weak. | | UW | SM | HQTT | 100 | | 20.5 | 20.05 - 20.06m: J, 15° dip, UN, SM, T-VN, CN 20.16m: J, 15° dip, UN, SL, T-VN, CN 20.25m: J, 10, UN,SL,T-VN,CN 20.30 - 20.35m: B, 20° dip, UN, SL to SM, T-VN, CN 20.44m: J, 15,ST,SM,T-VN,CN | | 2000 600 400 200 100 50 20 | 30 | 20.50 - 20.60m: J, 20° dip, to 40, orthog, UN, SL, T-VN, CN 20.51m: B, 20° dip, UN, R, T, CN 20.70m: J, 20° dip, UN, SM, T-VN, CN 20.87m: B, 15, UN,SM,T-VN, CN 20.95m: B, 15,UN,SL,T-VN,CN | | | | | | | | | | |
| | 22.5m: Unweathered, grey, fine SANDSTONE. Weak | | UW | SM | HQTT | 100 | | 21.0 | 21.12 - 21.18m: BZ, ExCS, UN, SL to ST, SM, VN, CN 21.22 - 21.25m: BZ, Rec f-c gvl (upper contact 10 to 90, UN, SL) 21.37 - 21.38m: J, 30 & orthog 90, UN, SM to ST, R, T-VN, CN 21.45 - 21.50m: B, 20° dip, UN, SL to ST, R, T-VN, CN 21.60 - 21.63m: BZ, Rec f-c gvl, lower contact 20 & orthog 70, ST, R, T-VN, CN 21.78m: B, 15° dip, UN, R, T-VN, CN 21.90m: B, 15, UN,SM,T-VN,CN 22.09 - 22.10m: J, 35° dip, UN, SL & UN, SM-R, T-VN, CN 22.17 - 22.30m: J, 20° dip, VCS, UN, SL, VN, CN, some calcite 22.17m: J, -25° dip, UN, SL, VN, Calcite | | | 50 | | | | | | | | | | | |
| | 23.26 - 23.30m: Fine to coarse SANDSTONE | | UW | SM | HQTT | 1500 | | 22.5 | 22.30 - 22.50m: BZ, Rec as f-c gvl, joints are 20 to 90, UN, R to UN, SL | | | | 750 | 22.72m: B, 20° dip, UN, SM, T-VN, CN 22.72 - 22.80m: J, 60 & orthog 40, UN, R, VN, calcite 22.86m: J, 20° dip, to 40, UN, SM, T, CN 22.97m: B, 20° dip, UN,SM,T,CN 23.00m: J, 20° dip, UN, SM, T-VN, CN 23.05m: B, 20° dip, UN, SL, VN, calcite 23.30m: J, 60° dip, UN, SM, N, calcite, grey silt 23.30 - 23.50m: J, 10° dip, to 30, VCS, UN, SM, VN, calcite 23.50 - 23.55m: BZ, Rec f-c gvl, upper contact 30, UN, SL, calcite, lower contact -10, UN, R, Calcite | | | | | | | | | |
| | 23.3m: Unweathered, dark grey, SILTSTONE, minor very thin beds of fine SANDSTONE. Weak | | UW | SM | HQTT | 1500 | | 23.0 | 23.58m: J, -30° dip, UN, SL, VN, calcite 23.63m: J, 20° dip, UN, SL to SM, VN, calcite 23.78 - 23.86m: J, 20° dip, to 40, UN, SM to ST, SM, T-VN, minor calcite 23.82m: DD, 0° dip 24.00m: DD, 0° dip, Hammer break 24.40m: DD, 5° dip, Hammer break | | | | 96 | 24.90m: DD, 0° dip, Hammer break | | | | | | | | | |
| | 23.78m: Unweathered, grey, fine to medium SANDSTONE. Weak to moderately strong | | UW | SM | HQTT | 1500 | | 23.5 | | | | | | | | | | | | | | | |
| | 24.00 - 24.10m: Fine to coarse SANDSTONE | | UW | SM | HQTT | 1500 | | 24.0 | | | | | | | | | | | | | | | |
| | 24.32m: Grades to unweathered, grey, fine to coarse SANDSTONE. Weak to moderately strong | | UW | SM | HQTT | 1500 | | 24.5 | | | | | | | | | | | | | | | |
| 24.75m: Unweathered, grey, fine to coarse SANDSTONE, minor fine to medium gravel size clasts. Weak to moderately strong. | | UW | SM | HQTT | 1500 | | 25.0 | | | | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth
26.8m

Scale 1:25

Rev.: A

BOREHOLE LOG

BOREHOLE No.:

BH14

SHEET: 6 OF 6

DRILLED BY: Lei

LOGGED BY: DSA

CHECKED: ALNA

START DATE: 29/05/2018

FINISH DATE: 30/05/2018

CONTRACTOR: McMillan

PROJECT: Auckland Regional Landfill
 JOB No.: 1005069.1120
 LOCATION: Refer site plan

CO-ORDINATES: 5977379.60 mN
 (NZTM2000) 1739925.24 mE

DIRECTION: 0°
 ANGLE FROM HORIZ.: -90°

R.L. GROUND: 28.00m
 R.L. COLLAR: 28.00m
 DATUM: NZVD2016
 SURVEY: Total Station/Surveyed

| GEOLOGICAL UNIT | DESCRIPTION OF CORE | | ROCK DEFECTS | | | | | | | | | | | | | | | | | | |
|-----------------|---|--|-----------------|---------------|-----------------|-------------------|---------|--------|-----------|-------------|------------|-----------------------|---------|--|----------------|-------------|--------|--------------|-------------|-------------------|--------------------|
| | SOIL: Classification, colour, consistency / density, moisture, plasticity ROCK: Weathering, colour, fabric, name, strength, cementation | | Rock Weathering | Rock Strength | Sampling Method | Core Recovery (%) | Testing | RL (m) | Depth (m) | Graphic Log | Defect Log | Fracture Spacing (mm) | RQD (%) | Description & Additional Observations | Fluid Loss (%) | Water Level | Casing | Installation | Core Box No | | |
| UW Pakiri | 24.75m [Cont'd]: Unweathered, grey, fine to coarse SANDSTONE, minor fine to medium gravel size clasts. Weak to moderately strong. | | UW | US | HQTT | 100 | | | | | | | | | | | | | | | |
| | 25.15m: Unweathered, grey, fine SANDSTONE, grading to fine to medium SANDSTONE from 26.25m, minor very thin beds of SILTSTONE. Weak to moderately strong 25.44 - 25.46m: Dark grey, SILTSTONE | | UW | US | HQTT | 100 | | 25.5 | | | | | 96 | 25.45m: J, 25° dip, UN, SL to SM, T, CN 25.50m: J, -60° dip, UN, SM, T-VN, CN 25.68m: J, 20° dip, UN, SL, T-VN, CN | | | | | | Box 9, 22.7-25.5m | |
| | 25.67 - 25.68m: Dark grey SILTSTONE | | UW | US | HQTT | 100 | | | | | | | | | | | | | | | |
| | 25.90 - 25.98m: Grades to fine to coarse SANDSTONE 25.98 - 26.00m: Dark grey SILTSTONE | | UW | US | HQTT | 100 | | 26.0 | | | | | 100 | 25.98m: B, 20° dip, UN, SL, T, CN 26.00m: J, 50° dip, UN, SL, T-VN, CN 26.22m: J, 50° dip, UN, R, T-VN, CN | | | | | | | |
| | 26.10m: Grades to fine to medium SANDSTONE | | UW | US | HQTT | 100 | | | | | | | | | | | | | | | |
| | 26.3m: Unweathered, grey, CONGLOMERATE. Conglomerate comprises fine to coarse gravel size lenses of dark grey SILTSTONE (2mm to 60mm) in fine to coarse SANDSTONE matrix. Matrix supported. Weak to moderately strong | | UW | US | HQTT | 100 | | 26.5 | | | | | | 26.40m: J, 20° dip, UN, SM to R, T, CN | | | | | | | Box 10, 25.5-26.8m |
| | 26.62m: Unweathered, grey, fine SANDSTONE, minor very thin (20mm) bed of dark grey siltstone at 26.75m. Weak to moderately strong | | UW | US | HQTT | 100 | | | | | | | | 26.70m: J, 30° dip, & orthog 30, UN, SM, T-VN, CN | | | | | | | |
| | 26.8m: Target depth | | UW | US | HQTT | 100 | | 27.0 | | | | | | | | | | | | | |

COMMENTS: 50mm I.D. piezometer. Shear vane No. 111. Presented shear vane readings have been corrected

Hole Depth
26.8m

Scale 1:25

Rev.: A