

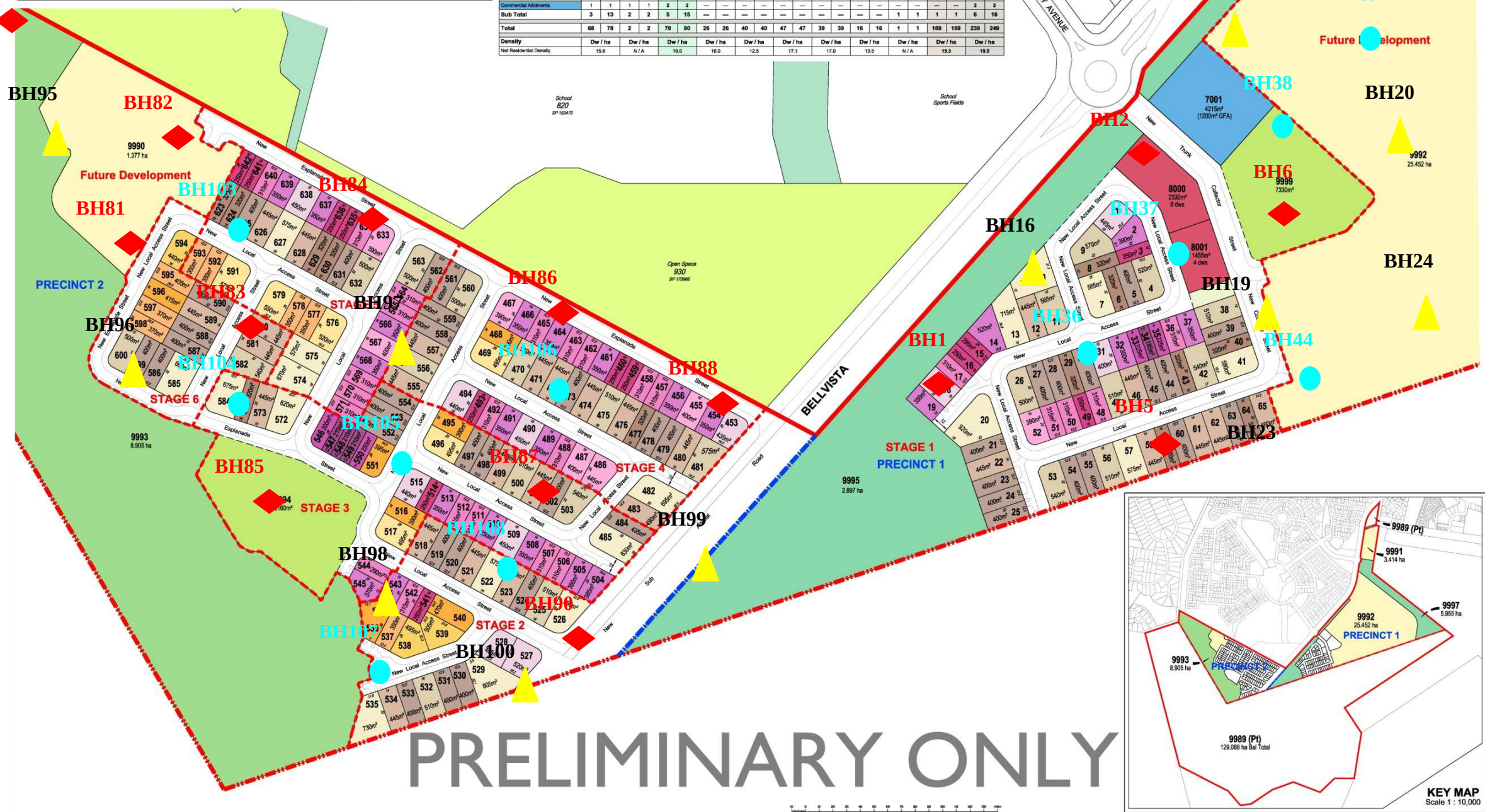
# Appendix A

## **Site Layout Plan**

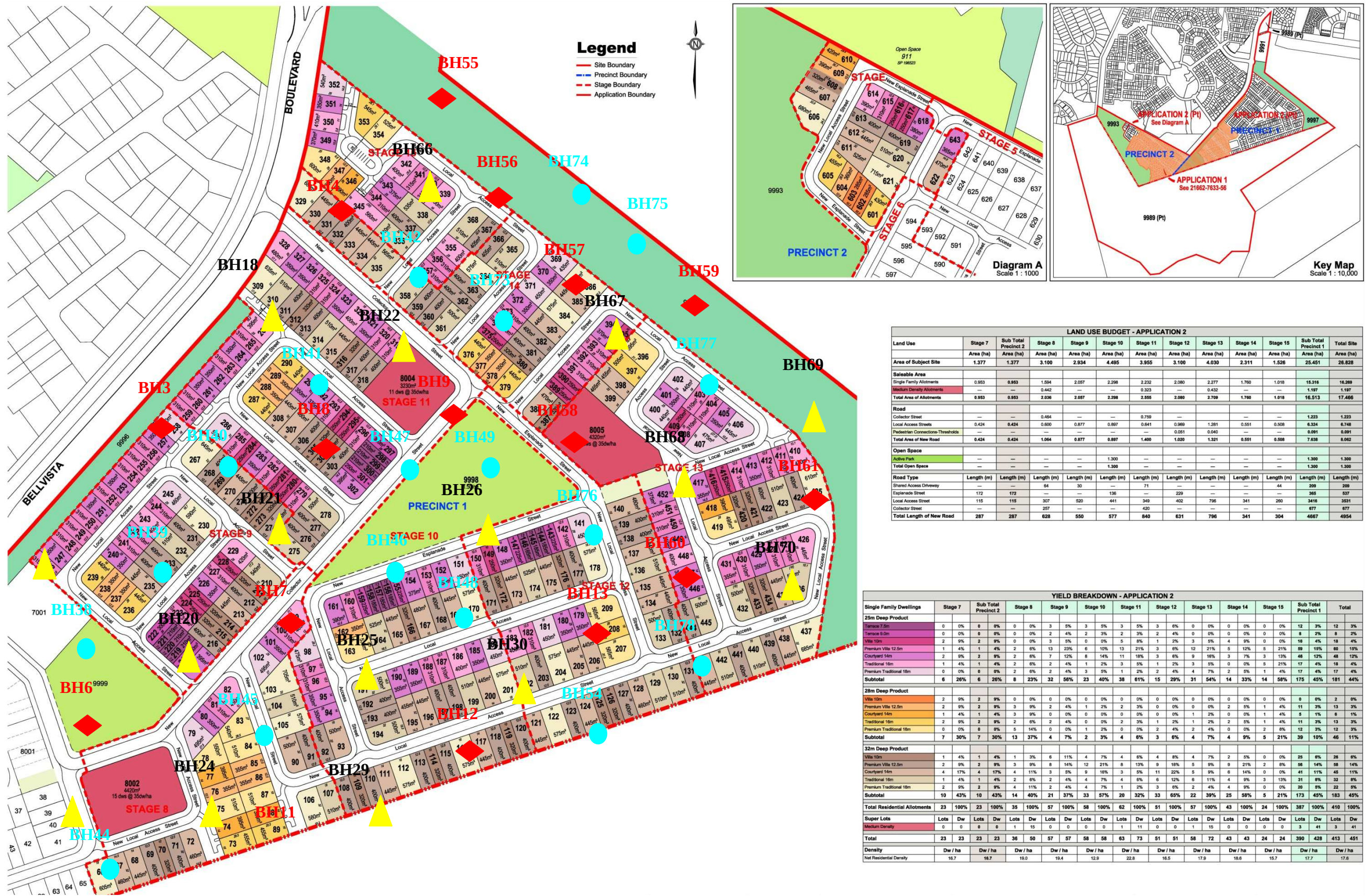
| LAND USE BUDGET - APPLICATION 1   |            |            |            |            |            |            |            |            |            |            |            |
|-----------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Land Use                          | Stage 1    | Balance    | Sub Total  | Stage 2    | Stage 3    | Stage 4    | Stage 5    | Stage 6    | Balance    | Sub Total  | Total Site |
| Area (ha)                         | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  | Area (ha)  |
| Area of Subject Site              | 9.393      | 10.282     | 19.675     | 2.807      | 3.191      | 2.743      | 2.295      | 1.194      | 33.832     | 45.852     | 65.527     |
| Sealable Area                     | 9.393      | 10.282     | 19.675     | 2.807      | 3.191      | 2.743      | 2.295      | 1.194      | 33.832     | 45.852     | 65.527     |
| Single Family Allotments          | 2.716      | —          | 2.716      | 1.212      | 1.989      | 1.890      | 1.908      | 0.719      | —          | 6.899      | 9.906      |
| Medium Density Allotments         | 0.379      | —          | 0.379      | —          | —          | —          | —          | —          | —          | —          | 0.379      |
| Commercial Site                   | 0.422      | —          | 0.422      | —          | —          | —          | —          | —          | —          | —          | 0.422      |
| Super Allotments                  | —          | 1.377      | 1.377      | —          | —          | —          | —          | —          | 27.876     | 27.876     | 29.253     |
| Total Area of Allotments          | 3.517      | 1.377      | 4.894      | 1.212      | 1.989      | 1.890      | 1.908      | 0.719      | 27.876     | 34.766     | 39.660     |
| Subtotal                          | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          |
| Road                              | —          | —          | —          | 0.967      | —          | —          | —          | —          | 0.967      | 0.967      | 0.967      |
| Sub Arterial Road                 | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          |
| Collector Street                  | 0.489      | —          | 0.489      | —          | —          | —          | —          | —          | —          | —          | 0.489      |
| Local Access Street               | 1.132      | —          | 1.132      | 0.408      | 0.806      | 0.803      | 0.786      | 0.474      | —          | 3.327      | 4.449      |
| Pedestrian Connections-Thresholds | 0.038      | —          | 0.038      | —          | —          | —          | —          | —          | —          | —          | 0.038      |
| Total Area of New Road            | 1.645      | —          | 1.645      | 1.395      | 0.806      | 0.803      | 0.786      | 0.474      | —          | 4.314      | 5.939      |
| Open Space                        | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          | —          |
| Active Park                       | 0.733      | —          | 0.733      | —          | 0.816      | —          | —          | —          | —          | 0.816      | 1.549      |
| Passive Open Space                | —          | 8.905      | 8.905      | —          | —          | —          | —          | —          | —          | —          | 8.905      |
| Stormwater Conveyance             | 3.498      | —          | 3.498      | —          | —          | —          | —          | —          | 5.956      | 5.956      | 9.454      |
| Total Open Space                  | 4.231      | 8.905      | 13.136     | —          | 0.816      | —          | —          | —          | 5.956      | 6.772      | 19.909     |
| Street Type                       | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) | Length (m) |
| Shared Access Driveway            | 82         | —          | 82         | 30         | 57         | 34         | —          | —          | —          | 121        | 263        |
| Esplanade Street                  | —          | —          | —          | 189        | 292        | 212        | —          | —          | —          | 693        | 892        |
| Local Access Street               | 630        | —          | 630        | 226        | 291        | 292        | 198        | —          | —          | 1298       | 1988       |
| Collector Street                  | 73         | —          | 73         | —          | —          | —          | —          | —          | —          | —          | 73         |
| Trunk Collector Street            | 187        | —          | 187        | —          | —          | —          | —          | —          | —          | —          | 187        |
| Sub Arterial Road                 | —          | —          | —          | 247        | —          | —          | —          | —          | —          | 247        | 247        |
| Total Length of New Road          | 952        | —          | 952        | 503        | 533        | 569        | 504        | 319        | —          | 2428       | 3380       |

| YIELD BREAKDOWN - APPLICATION 1 |         |                       |                         |         |         |         |         |         |                       |                         |         |         |         |         |         |         |         |         |         |         |
|---------------------------------|---------|-----------------------|-------------------------|---------|---------|---------|---------|---------|-----------------------|-------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Single Family Dwellings         | Stage 1 | Balance<br>Precinct 1 | Sub Total<br>Precinct 1 | Stage 2 | Stage 3 | Stage 4 | Stage 5 | Stage 6 | Balance<br>Precinct 2 | Sub Total<br>Precinct 2 | Total   |         |         |         |         |         |         |         |         |         |
| 25m Deep Product                |         |                       |                         |         |         |         |         |         |                       |                         |         |         |         |         |         |         |         |         |         |         |
| Terrace 7.5m                    | 1       | 2%                    | —                       | 1       | 2%      | —       | 0%      | 3       | 8%                    | —                       | 4       | 2%      |         |         |         |         |         |         |         |         |
| Terrace 8.0m                    | 2       | 3%                    | —                       | 2       | 3%      | —       | 0%      | 2       | 5%                    | —                       | 2       | 1%      | 4       | 2%      |         |         |         |         |         |         |
| Villa 10m                       | 4       | 6%                    | —                       | 4       | 6%      | 1       | 4%      | 1       | 3%                    | 3                       | 6%      | 4       | 10%     | —       | 9       | 5%      | 13      | 6%      |         |         |
| Premium Villa 12.5m             | 5       | 8%                    | —                       | 5       | 8%      | 1       | 4%      | 5       | 13%                   | 7                       | 18%     | —       | —       | —       | 20      | 12%     | 25      | 11%     |         |         |
| Courtyard 14m                   | 5       | 8%                    | —                       | 5       | 8%      | 1       | 4%      | 5       | 13%                   | 7                       | 18%     | 4       | 10%     | —       | 18      | 11%     | 23      | 10%     |         |         |
| Traditional 15m                 | 1       | 2%                    | —                       | 1       | 2%      | 0%      | —       | 4       | 9%                    | 2                       | 5%      | 2%      | —       | —       | 6       | 4%      | 7       | 3%      |         |         |
| Premium Traditional 15m         | 3       | 6%                    | —                       | 3       | 6%      | 2       | 5%      | 3       | 8%                    | 1                       | 3%      | —       | —       | —       | 8       | 5%      | 11      | 6%      |         |         |
| Subtotal                        | 21      | 32%                   | —                       | 21      | 32%     | 5       | 19%     | 19      | 48%                   | 24                      | 51%     | 18      | 46%     | —       | 66      | 39%     | 87      | 37%     |         |         |
| 28m Deep Product                |         |                       |                         |         |         |         |         |         |                       |                         |         |         |         |         |         |         |         |         |         |         |
| Villa 10m                       | —       | 0%                    | —                       | —       | 0%      | —       | 0%      | —       | 0%                    | —                       | 0%      | —       | —       | —       | —       | —       | —       | 0%      | —       |         |
| Premium Villa 12.5m             | —       | 0%                    | —                       | —       | 0%      | 1       | 4%      | —       | 0%                    | 4                       | 10%     | 3       | 18%     | —       | 8       | 5%      | 8       | 3%      | 2%      |         |
| Courtyard 14m                   | —       | 0%                    | —                       | —       | 0%      | 2       | 8%      | 3       | 8%                    | 1                       | 2%      | —       | 0%      | 1       | 8%      | 7       | 4%      | 7       | 3%      |         |
| Traditional 15m                 | —       | 0%                    | —                       | —       | 0%      | 2       | 8%      | —       | 0%                    | —                       | 0%      | —       | 0%      | 1       | 8%      | 3       | 2%      | 3       | 1%      |         |
| Premium Traditional 15m         | —       | 0%                    | —                       | —       | 0%      | —       | 2       | 5%      | 1                     | 2%                      | 3       | 8%      | —       | 0%      | —       | 6       | 4%      | 6       | 3%      |         |
| Subtotal                        | —       | 0%                    | —                       | —       | 0%      | 5       | 19%     | 5       | 13%                   | 2                       | 4%      | 7       | 18%     | 5       | 31%     | —       | 24      | 14%     | 24      | 10%     |
| 32m Deep Product                |         |                       |                         |         |         |         |         |         |                       |                         |         |         |         |         |         |         |         |         |         |         |
| Villa 10m                       | 7       | 11%                   | —                       | 7       | 11%     | —       | 0%      | 1       | 2%                    | 2                       | 4       | 10%     | —       | —       | 6       | 4%      | 13      | 6%      | —       |         |
| Premium Villa 12.5m             | 15      | 23%                   | —                       | 15      | 23%     | 6       | 23%     | 7       | 18%                   | 5                       | 13%     | 3       | 8%      | 5       | 31%     | —       | 27      | 16%     | 42      | 18%     |
| Courtyard 14m                   | 7       | 11%                   | —                       | 7       | 11%     | 4       | 15%     | 3       | 8%                    | 8                       | 17%     | 2       | 5%      | 3       | 18%     | —       | 20      | 12%     | 27      | 12%     |
| Traditional 15m                 | 9       | 14%                   | —                       | 9       | 14%     | 2       | 8%      | 2       | 5%                    | 11%                     | 2       | 5%      | 2       | 13%     | —       | 13      | 8%      | 22      | 9%      |         |
| Premium Traditional 15m         | 6       | 9%                    | —                       | 6       | 9%      | 4       | 15%     | 3       | 8%                    | 1                       | 2%      | 3       | 8%      | 1       | 8%      | —       | 12      | 7%      | 16      | 6%      |
| Subtotal                        | 44      | 68%                   | —                       | 44      | 68%     | 16      | 62%     | 16      | 40%                   | 21                      | 49%     | 14      | 36%     | 11      | 89%     | —       | 78      | 48%     | 122     | 52%     |
| Total Residential Allotments    | 65      | 100%                  | —                       | 65      | 100%    | 26      | 100%    | 40      | 100%                  | 47                      | 100%    | 39      | 100%    | 16      | 100%    | —       | 168     | 100%    | 233     | 100%    |
| Super Lots                      | Lots    | Dw                    | Lots                    | Dw      | Lots    | Dw      | Lots    | Dw      | Lots                  | Dw                      | Lots    | Dw      | Lots    | Dw      | Lots    | Dw      | Lots    | Dw      | Lots    | Dw      |
| Medium Density                  | 2       | 12                    | —                       | —       | 2       | 12      | —       | —       | —                     | —                       | —       | —       | —       | —       | —       | —       | —       | —       | 2       | 12      |
| Balance Super Allotment         | —       | —                     | 1                       | 1       | 1       | 1       | —       | —       | —                     | —                       | —       | —       | —       | 1       | 1       | 1       | 1       | 2       | 2       |         |
| Commercial Allotments           | 1       | 1                     | 1                       | 1       | 2       | 2       | —       | —       | —                     | —                       | —       | —       | —       | —       | —       | —       | —       | 2       | 2       |         |
| Sub Total                       | 3       | 13                    | 2                       | 2       | 5       | 15      | —       | —       | —                     | —                       | —       | —       | —       | 1       | 1       | 1       | 1       | 6       | 16      |         |
| Total                           | 68      | 78                    | 2                       | 2       | 70      | 80      | 26      | 40      | 40                    | 47                      | 47      | 39      | 39      | 16      | 16      | 1       | 169     | 169     | 239     | 249     |
| Density                         | Dw / ha | Dw / ha               | Dw / ha                 | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha               | Dw / ha                 | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha | Dw / ha |
| Net Residential Density         | 15.6    | N/A                   | 16.0                    | 16.0    | 16.0    | 12.5    | 17.1    | 17.0    | 13.5                  | N/A                     | 15.3    | 15.8    | —       | —       | —       | —       | —       | —       | —       | —       |

BH80



|          |                                                 |       |          |      |                                                                                                                                                                                             |               |            |                                                                                             |             |                                   |                     |
|----------|-------------------------------------------------|-------|----------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|---------------------------------------------------------------------------------------------|-------------|-----------------------------------|---------------------|
| revision | description                                     | drawn | approved | date | <div><div></div> BH drilled to 6m ASS to 3m</div> <div><div></div> BH drilled to 4m ASS to 4m</div> <div><div></div> BH drilled to 3m ASS to 3m</div> <div>ASS samples taken at 0.25m</div> | drawn         | RY         | <div><div>coffey</div><div>geotechnics</div><div>SPECIALISTS MANAGING THE EARTH</div></div> | client:     | BROWN CONSULTING (QLD) PTY LTD    |                     |
|          | DCP testing to 1.5m in all BH locations         |       |          |      |                                                                                                                                                                                             | approved      | AC         |                                                                                             | project:    | BELLVISTA 2                       |                     |
|          | 4 CBR subgrade samples                          |       |          |      |                                                                                                                                                                                             | date          | 29-11-2010 |                                                                                             | title:      | PRECINCT 1 & 2 BOREHOLE LOCATIONS |                     |
|          | 2 Emerson in topsoil and 6 Emerson in subsoil   |       |          |      |                                                                                                                                                                                             | scale         | NTS        |                                                                                             | project no: | GEOTKPAR01560AA                   | figure no: FIGURE 1 |
|          | 4 soil samples (1kg) at varying depths up to 2m |       |          |      |                                                                                                                                                                                             | original size | A3         |                                                                                             |             |                                   |                     |



|          |                                                 |       |          |      |                                                                                                                                                                                                |               |            |                                                                                             |             |                                |                     |
|----------|-------------------------------------------------|-------|----------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|---------------------------------------------------------------------------------------------|-------------|--------------------------------|---------------------|
| revision | description                                     | drawn | approved | date | <div><div>◆</div> BH drilled to 6m ASS to 3m</div> <div><div>▲</div> BH drilled to 4m ASS to 4m</div> <div><div>●</div> BH drilled to 3m ASS to 3m</div> <div>ASS samples taken at 0.25m</div> | drawn         | RY         | <div><div>coffey</div><div>geotechnics</div><div>SPECIALISTS MANAGING THE EARTH</div></div> | client:     | BROWN CONSULTING (QLD) PTY LTD |                     |
|          | DCP testing to 1.5m in all BH locations         |       |          |      |                                                                                                                                                                                                | approved      | AC         |                                                                                             | project:    | BELLVISTA 2                    |                     |
|          | 4 CBR subgrade samples                          |       |          |      |                                                                                                                                                                                                | date          | 29-11-2010 |                                                                                             | title:      | PRECINCT 1 BOREHOLE LOCATIONS  |                     |
|          | 2 Emerson in topsoil and 6 Emerson in subsoil   |       |          |      |                                                                                                                                                                                                | scale         | NTS        |                                                                                             | project no: | GEOTKPAR01560AA                | figure no: FIGURE 1 |
|          | 4 soil samples (1kg) at varying depths up to 2m |       |          |      |                                                                                                                                                                                                | original size | A3         |                                                                                             |             |                                |                     |

# Appendix B

**Plates 1-4**



**PLATE 1**

Title: **Area 3 precinct Northern Aspect**



**PLATE 2**

Title: **Area 3 precinct South Eastern Aspect**



**PLATE 3**

Title: **West Drain**



**PLATE 4**

Title: **South Drain**

Date Taken: **20/04/09**

Taken By: **LC**

**coffey**   
geotechnics  
SPECIALISTS MANAGING  
THE EARTH

Client: **Brown Consulting Pty Ltd**

Project: **Bellvista 2 Area 3 Precinct**

Title: **Plates 1 to 4**

Project No.: **GEOTKPAR01560AA/C**

**Appendix B**

# Appendix C

## **Borehole Logs and Explanation Sheets**

Borehole No. **BH1**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **15.6.2009**Date completed: **15.6.2009**

Logged by: **DF**

Checked by:

| drill model and mounting:                            |             |   |   | EDSON CPI |       | Easting:                                                                    |    | slope: -90°                                                                                                                                                                                                                                                                                                              |             | R.L. Surface:                                                                 |                                                                                                               | NOT MEASURED                                                                                                   |                               |                                                                                                                                                                   |                                          |                        |
|------------------------------------------------------|-------------|---|---|-----------|-------|-----------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------|
| hole diameter:                                       |             |   |   | 100 mm    |       | Northing:                                                                   |    | bearing:                                                                                                                                                                                                                                                                                                                 |             | datum:                                                                        |                                                                                                               | GDA94                                                                                                          |                               |                                                                                                                                                                   |                                          |                        |
| drilling information                                 |             |   |   |           |       | material substance                                                          |    |                                                                                                                                                                                                                                                                                                                          |             |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |
| method                                               | penetration |   |   | support   | water | notes<br>samples,<br>tests, etc                                             | RL | depth<br>metres                                                                                                                                                                                                                                                                                                          | graphic log | classification<br>symbol                                                      | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                          | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa                                                                                                                                | structure and<br>additional observations |                        |
|                                                      | 1           | 2 | 3 |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          |             |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |
| ADT                                                  |             |   |   |           |       | CBR                                                                         |    | 1                                                                                                                                                                                                                                                                                                                        |             | SM                                                                            | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                                                                                                              | L                             |                                                                                                                                                                   |                                          |                        |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          |             | SP                                                                            | SAND: fine to medium grained, pale brown, trace of silt and clay fines.                                       | W                                                                                                              |                               |                                                                                                                                                                   |                                          |                        |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | SC          | CLAYEY SAND: fine to medium grained, pale brown/orange, low plasticity fines. |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          |             | CL                                                                            | SANDY CLAY: low plasticity, pale brown/orange and red, fine to medium sand, trace of gravel.                  | M                                                                                                              | St                            |                                                                                                                                                                   | DIST PP=110kPa                           |                        |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | 2           |                                                                               | CH                                                                                                            | SANDY CLAY: medium plasticity/high plasticity, orange/red and pale grey, fine to medium sand, trace of gravel. |                               | VSt                                                                                                                                                               |                                          | DIST PP=190kPa         |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          |             | CH                                                                            | SANDY CLAY: high plasticity, red and pale grey, fine to medium sand.                                          |                                                                                                                |                               |                                                                                                                                                                   |                                          | DIST PP=250kPa         |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | 3           |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          | DIST PP=290kPa         |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | 4           |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          | DIST PP=280kPa         |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | 5           |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          | DIST PP=250kPa         |
|                                                      |             |   |   |           |       |                                                                             |    |                                                                                                                                                                                                                                                                                                                          | 6           |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          | LIMIT OF INVESTIGATION |
|                                                      |             |   |   |           |       |                                                                             |    | 7                                                                                                                                                                                                                                                                                                                        |             |                                                                               | Borehole BH1 terminated at 6m                                                                                 |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |
|                                                      |             |   |   |           |       |                                                                             |    | 8                                                                                                                                                                                                                                                                                                                        |             |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |
| method                                               |             |   |   |           |       | support                                                                     |    | notes, samples, tests                                                                                                                                                                                                                                                                                                    |             |                                                                               |                                                                                                               | classification symbols and soil description                                                                    |                               | consistency/density index                                                                                                                                         |                                          |                        |
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T |             |   |   |           |       | M mud<br>C casing                                                           |    | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |             |                                                                               |                                                                                                               | based on unified classification system                                                                         |                               | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                                          |                        |
| *bit shown by suffix<br>e.g. ADT                     |             |   |   |           |       | penetration<br>1 2 3 4<br>no resistance ranging to refusal                  |    |                                                                                                                                                                                                                                                                                                                          |             |                                                                               |                                                                                                               | moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>Wl liquid limit                                   |                               |                                                                                                                                                                   |                                          |                        |
|                                                      |             |   |   |           |       | water<br>10/1/98 water level on date shown<br>water inflow<br>water outflow |    |                                                                                                                                                                                                                                                                                                                          |             |                                                                               |                                                                                                               |                                                                                                                |                               |                                                                                                                                                                   |                                          |                        |

Borehole No. **BH2**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509232.017 slope: -90° R.L. Surface: 40.28  
hole diameter: 100 mm Northing 7035296.399 bearing: datum: GDA94

| drilling information                                                                                                                                                                                                   |             |   |   |         |       | material substance                                                                                                                                                                  |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| method                                                                                                                                                                                                                 | penetration |   |   | support | water | notes<br>samples,<br>tests, etc                                                                                                                                                     | RL | depth<br>metres                                                                                                                                                                                                                                                                                                                                          | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                                                                                                                                  | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa                                                                                                                                                                    | structure and<br>additional observations |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       |                                                                                                                                                                                     | 40 |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                          | M                                                                                                                                                                                                                      | L                             |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | SILTY SAND: fine to medium grained, dark grey.                                                                |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | SAND: fine to medium grained, grey, trace of silt.                                                            | M/W                                                                                                                                                                                                                    |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 1  |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | SAND: fine to coarse grained, pale grey.                                                                      | W                                                                                                                                                                                                                      | L/MD                          |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             | CL                       | SANDY CLAY: medium plasticity, orange/red and<br>pale grey, fine to coarse grained sand, trace of<br>gravel.  | M                                                                                                                                                                                                                      | St                            | X                                                                                                                                                                                                     | DIST PP=140kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 2  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | SANDY CLAY: high plasticity, red and pale grey,<br>fine to medium grained sand.                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 3  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        | VSt                           | X                                                                                                                                                                                                     | DIST PP=220kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 4  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 5  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               | X                                                                                                                                                                                                     | DIST PP=250kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 6  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          | Borehole BH2 terminated at 6m                                                                                 |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 7  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                     | 8  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         |       | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br><b>water</b><br><br>10/1/98 water level<br>on date shown<br><br>water inflow<br><br>water outflow |    | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |             |                          |                                                                                                               | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>W <sub>p</sub> plastic limit<br>W <sub>L</sub> liquid limit |                               | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                                          |

**method**  
AS auger screwing\*  
AD auger drilling\*  
RR roller/tricone  
W washbore  
CT cable tool  
HA hand auger  
DT diatube  
B blank bit  
V V bit  
T TC bit  
\*bit shown by suffix  
e.g. ADT

**support**  
M mud  
C casing  
**penetration**  
1 2 3 4  
no resistance  
ranging to  
refusal  
**water**  
10/1/98 water level  
on date shown  
water inflow  
water outflow

**notes, samples, tests**  
U<sub>50</sub> undisturbed sample 50mm diameter  
U<sub>63</sub> undisturbed sample 63mm diameter  
D disturbed sample  
N standard penetration test (SPT)  
N\* SPT - sample recovered  
Nc SPT with solid cone  
V vane shear (kPa)  
P pressuremeter  
Bs bulk sample  
E environmental sample  
R refusal

**classification symbols and  
soil description**  
based on unified classification  
system  
**moisture**  
D dry  
M moist  
W wet  
Wp plastic limit  
WL liquid limit

**consistency/density index**  
VS very soft  
S soft  
F firm  
St stiff  
VSt very stiff  
H hard  
Fb friable  
VL very loose  
L loose  
MD medium dense  
D dense  
VD very dense

Borehole No. **BH3**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509425.371 slope: -90° R.L. Surface: 5.683  
hole diameter: 100 mm Northing 7035521.319 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log                                                                         | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |                        |
| ADT                  | 1           | 2 | 3 | N       |       |                                 |    |                 |    | SC                       | CLAYEY SAND: fine to medium grained, pale brown, low plasticity fines.                                        | M                     | MD                            | 100                                | FILL                                     |                        |
|                      |             |   |   |         |       |                                 |    |                 |    | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             |                       |                               | 200                                | NATURAL                                  |                        |
|                      |             |   |   |         |       |                                 | 5  | 1               |    | SP                       | SAND: fine to medium grained, grey/brown, trace of silt and clay.                                             |                       |                               | 300                                |                                          |                        |
|                      |             |   |   |         |       |                                 | 4  | 2               |   | CH                       | SANDY CLAY: high plasticity, pale brown/orange and pale grey, fine to medium grained sand.                    |                       | St                            | X                                  | DIST PP=180kPa                           |                        |
|                      |             |   |   |         |       |                                 |    |                 |                                                                                     |                          | VSt                                                                                                           | X                     | DIST PP=240kPa                |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 |    |                 |                                                                                     |                          |                                                                                                               | X                     | DIST PP=200kPa                |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 |    |                 |                                                                                     |                          |                                                                                                               | X                     | DIST PP=250kPa                |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 |    |                 |                                                                                     |                          |                                                                                                               | X                     | DIST PP=340kPa                |                                    |                                          |                        |
|                      |             |   |   |         |       | ASS                             | 3  | 3               |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 | 2  | 4               |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 | 1  | 5               |                                                                                     | CH                       | SANDY CLAY: high plasticity, pale grey, fine to coarse grained sand.                                          |                       |                               | X                                  | DIST PP=350kPa                           |                        |
|                      |             |   |   |         |       |                                 | 0  | 6               |  | SC                       | CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.                                      |                       | D                             |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 |    |                 |                                                                                     |                          | Borehole BH3 terminated at 6m                                                                                 |                       |                               |                                    |                                          | LIMIT OF INVESTIGATION |
|                      |             |   |   |         |       |                                 | -1 | 7               |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 | -2 |                 |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |   |   |         |       |                                 |    | 8               |                                                                                     |                          |                                                                                                               |                       |                               |                                    |                                          |                        |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH4**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509573.345 slope: -90° R.L. Surface: 6.686  
hole diameter: 100 mm Northing 7035673.856 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol      | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                             | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             | SM                            | <b>SILTY SAND:</b> fine to medium grained, dark grey,<br>trace of organics.                                                                               | M                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  | 1               |             | SP                            | <b>SAND:</b> fine to medium grained, grey.<br><br>...colour changing to dark brown.                                                                       | W                     |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  | 2               |             | SP                            | <b>SAND:</b> fine to medium grained, brown, with silt<br>and trace of gravel.                                                                             | M                     | VD                            |                                    | DIST PP=100kPa                           |
|                      |             |   |   |         |       |                                 | 5  | 2               |             | CH                            | <b>SANDY CLAY:</b> medium to high plasticity, pale<br>brown/orange and pale grey, fine to medium grained<br>sand.<br><br>...colour changing to pale grey. |                       | St                            | x                                  |                                          |
|                      |             |   |   |         |       |                                 | 4  | 3               |             |                               |                                                                                                                                                           |                       | VSt                           | x                                  | DIST PP=220kPa                           |
|                      |             |   |   |         |       |                                 | 4  | 4               |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  | 5               |             |                               |                                                                                                                                                           |                       | VSt/H                         | x                                  | DIST PP=400kPa                           |
|                      |             |   |   |         |       |                                 | 3  | 6               |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  | 7               |             |                               |                                                                                                                                                           |                       | VSt                           | x                                  | DIST PP=240kPa                           |
|                      |             |   |   |         |       |                                 | 1  | 8               |             | CL                            | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine<br>to coarse grained sand, trace of gravel.                                                         |                       |                               | x                                  | DIST PP=200kPa                           |
|                      |             |   |   |         |       |                                 | 1  | 9               |             | CH                            | <b>SANDY CLAY:</b> high plasticity, pale grey, fine to<br>medium grained sand.                                                                            |                       | St                            | x                                  | DIST PP=200kPa                           |
|                      |             |   |   |         |       |                                 | 6  | 10              |             |                               |                                                                                                                                                           |                       |                               | x                                  | DIST PP=200kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             | Borehole BH4 terminated at 6m |                                                                                                                                                           |                       |                               |                                    | DIST PP=200kPa<br>LIMIT OF INVESTIGATION |
|                      |             |   |   |         |       |                                 | 0  | 11              |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 | 12              |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 13              |             |                               |                                                                                                                                                           |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance<br>ranging to<br>refusal<br><b>water</b><br>10/1/98 water level<br>on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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Borehole No. **BH5**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509257.586 slope: -90° R.L. Surface: 2.941  
hole diameter: 100 mm Northing 7035081.794 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                              | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             |                          |                                                                                                                                            | M                     | L                             |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                                                   |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                                                  |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey.<br><br>...colour changing to pale grey and brown.<br><br>...colour changing to dark brown. | M/W                   | D/VD                          |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, dark brown, low plasticity fines.<br>...colour changing to pale grey.                          | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                                                      | M                     | VSt                           | X                                  | DIST PP=220KPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               | X                                  | DIST PP=240kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               | X                                  | DIST PP=280kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey/orange and red, fine to medium grained sand, trace of gravel.                                |                       |                               | X                                  | DIST PP=250kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH5 terminated at 6m                                                                                                              |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                                                            |                       |                               |                                    |                                          |
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| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance<br>ranging to<br>refusal<br><b>water</b><br>10/1/98 water level<br>on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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# Engineering Log - Borehole

Borehole No. **BH6**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting: |             |   |   | EDSON CPI |       | Easting: 509369.352             |    | slope: -90°     |                                                                          | R.L. Surface: 4.099                                                        |          |                       |                               |                                    |                                          |  |
|---------------------------|-------------|---|---|-----------|-------|---------------------------------|----|-----------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|----------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|--|
| hole diameter:            |             |   |   | 100 mm    |       | Northing: 7035242.058           |    | bearing:        |                                                                          | datum: GDA94                                                               |          |                       |                               |                                    |                                          |  |
| drilling information      |             |   |   |           |       | material substance              |    |                 |                                                                          |                                                                            |          |                       |                               |                                    |                                          |  |
| method                    | penetration |   |   | support   | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log                                                              | classification<br>symbol                                                   | material | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |  |
|                           | 1           | 2 | 3 |           |       |                                 |    |                 |                                                                          |                                                                            |          |                       |                               |                                    |                                          |  |
| ADT                       |             | N | N | D         | ASS   | 4                               |    |                 | SM                                                                       | SILTY SAND: fine to medium grained, dark grey, trace of organics and clay. | M        | L                     |                               |                                    |                                          |  |
|                           |             |   |   |           |       |                                 |    | SC              | CLAYEY SAND: fine to medium grained, dark grey, medium plasticity fines. |                                                                            |          |                       |                               |                                    |                                          |  |
|                           |             |   |   |           |       |                                 |    |                 |                                                                          |                                                                            |          |                       |                               |                                    |                                          |  |
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|                           |             |   |   |           |       |                                 |    |                 |                                                                          |                                                                            |          |                       |                               |                                    |                                          |  |
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|                           |             |   |   |           |       |                                 |    |                 |                                                                          |                                                                            |          |                       |                               |                                    |                                          |  |

Borehole No. **BH7**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509511.686 slope: -90° R.L. Surface: 4.749  
hole diameter: 100 mm Northing 7035329.518 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                             |            |            |                                          |            |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|-----------------------------|------------|------------|------------------------------------------|------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter |            |            | structure and<br>additional observations |            |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               | 100<br>kPa                  | 200<br>kPa | 300<br>kPa |                                          | 400<br>kPa |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             | SM                       | <b>SILTY SAND<sup>TM</sup></b> fine to medium grained, dark grey,<br>trace of organics.                       | M                     | L                             |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 | 4  | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     |                       |                               |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | ...with gravel.                                                                                               | W                     | MD                            |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 | 3  | 2               |             | SC                       | <b>SILTY CLAYEY SAND:</b> fine to medium grained,<br>pale brown and grey, low plasticity fines.               | M                     | MD/D                          |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 |    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, dark brown, trace<br>of silt.                                            |                       | VD                            |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 | 2  | 3               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale<br>grey/brown, fine to medium grained sand.                |                       | VSt                           |                             |            |            |                                          |            |
|                      |             |   |   |         | ASS   |                                 | 1  | 4               |             |                          | ...fine to coarse grained sand, trace of gravel.                                                              |                       |                               |                             |            | ×          | DIST PP=250kPa                           |            |
|                      |             |   |   |         |       |                                 | 0  | 5               |             |                          |                                                                                                               |                       |                               |                             |            | ×          | DIST PP=280kPa                           |            |
|                      |             |   |   |         |       |                                 | -1 | 6               |             | SC                       | <b>CLAYEY SAND:</b> fine to coarse grained, pale<br>grey/brown, low plasticity fines.                         | W                     | D                             |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH7 terminated at 6m                                                                                 |                       |                               |                             |            |            | LIMIT OF INVESTIGATION                   |            |
|                      |             |   |   |         |       |                                 | -2 | 7               |             |                          |                                                                                                               |                       |                               |                             |            |            |                                          |            |
|                      |             |   |   |         |       |                                 | -3 | 8               |             |                          |                                                                                                               |                       |                               |                             |            |            |                                          |            |

| method                                                                                                                                                                                                | support                                                                                                                                                                 | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and<br>soil description<br>based on unified classification<br>system | consistency/density index                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | M mud<br>C casing<br>penetration<br>1 2 3 4<br>no resistance<br>ranging to<br>refusal<br>water<br>10/1/98 water level<br>on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit                | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH8**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509564.073 slope: -90° R.L. Surface: 5.018  
hole diameter: 100 mm Northing 7035499.905 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                                                                             |                       |                               |                           |       |                                          |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|---------------------------|-------|------------------------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                               | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>kPa | meter | structure and<br>additional observations |
| ADT                  | 1 2 3       | N       |       | D                               |                    | 1               |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace or organics.                                                                                    | M                     | MD                            |                           |       | DIST PP=200kPa                           |
|                      |             |         |       |                                 | 4                  | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, grey.<br><br>...trace of clay.                                                                                         | M/W                   | D                             |                           |       |                                          |
|                      |             |         |       |                                 | 3                  | 2               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                                                                       | M                     | St                            | X                         |       |                                          |
|                      |             |         |       | ASS                             | 2                  | 3               |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey, low plasticity fines.<br><br>...fine to coarse grained, colour changing to pale grey and pale brown. | W                     | MD                            |                           |       | DIST PP=150kPa                           |
|                      |             |         |       |                                 | 1                  | 4               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.                                                            | M                     | St                            | X                         |       |                                          |
|                      |             |         |       |                                 | 0                  | 5               |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine to coarse grained sand.                                                                               |                       |                               | X                         |       | DIST PP=160kPa                           |
|                      |             |         |       |                                 | -1                 | 6               |             |                          |                                                                                                                                                             |                       |                               |                           |       |                                          |
|                      |             |         |       |                                 | -2                 | 7               |             |                          | Borehole BH8 terminated at 6m                                                                                                                               |                       |                               |                           |       | LIMIT OF INVESTIGATION                   |
|                      |             |         |       |                                 |                    | 8               |             |                          |                                                                                                                                                             |                       |                               |                           |       |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                         |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH9**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Date started: **1.5.2009**

Date completed: **1.5.2009**

Logged by: **DF**

Checked by:

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

drill model and mounting: EDSON CPI Easting: 508688.458 slope: -90° R.L. Surface: 4.859  
hole diameter: 100 mm Northing 7035509.614 bearing: datum: GDA94

| drilling information |             |         |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
| ADT                  | 1 2 3       | N       |       |                                 |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                      | M                     | L                             |                                    |                                          |
|                      |             |         |       |                                 | 4  | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     | M/W                   |                               |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, grey, fine to medium grained sand.                                      | M                     | St                            |                                    |                                          |
|                      |             |         |       |                                 | 3  | 2               |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey.                                                               | W                     | MD                            |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine to medium grained sand.                                 |                       | St                            |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey.                                                               |                       | MD                            |                                    |                                          |
|                      |             |         |       |                                 | 2  | 3               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.              | M                     | VSt                           | X                                  | DIST PP=220kPa                           |
|                      |             |         |       |                                 |    |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey, medium plasticity fines.                               | W                     | MD                            |                                    |                                          |
|                      |             |         |       |                                 | 1  | 4               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                         | M                     | St                            | X                                  | DIST PP=150kPa                           |
|                      |             |         |       |                                 | 0  | 5               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=190kPa                           |
|                      |             |         |       |                                 | -1 | 6               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=200kPa                           |
|                      |             |         |       |                                 |    |                 |             |                          | Borehole BH9 terminated at 6m                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |         |       |                                 | -2 | 7               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | -3 | 8               |             |                          |                                                                                                               |                       |                               |                                    |                                          |

| method                                                                                | support                                                                                                                                                                                                                                                             | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and soil description                                                                                   | consistency/density index                                                                                                                                         |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix e.g. ADT | M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH10**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|---------------------------|--|-------------|---|---|---------|-------|---------------------------|----|--------------|-------------|-----------------------|--------------------------------------------------------------------------------------------|--|--|--------------------|--|--|--|--|-----------------------|--|--------------------|----------------------------|---------------------|--|--|---------------------------------------|--|--|-------------|--|--|--|--|--|--|--|--|--|---------------------|--|--|--|--|--|--|--|--|--|
| drill model and mounting: |  |             |   |   |         |       |                           |    |              | EDSON CPI   |                       |                                                                                            |  |  |                    |  |  |  |  | Easting: 509347.645   |  |                    |                            |                     |  |  |                                       |  |  | slope: -90° |  |  |  |  |  |  |  |  |  | R.L. Surface: 2.135 |  |  |  |  |  |  |  |  |  |
| hole diameter:            |  |             |   |   |         |       |                           |    |              | 100 mm      |                       |                                                                                            |  |  |                    |  |  |  |  | Northing: 7034935.693 |  |                    |                            |                     |  |  |                                       |  |  | bearing:    |  |  |  |  |  |  |  |  |  | datum: GDA94        |  |  |  |  |  |  |  |  |  |
| drilling information      |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  | material substance |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
| method                    |  | penetration |   |   | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material                                                                                   |  |  |                    |  |  |  |  |                       |  | moisture condition | consistency/ density index | pocket penetrometer |  |  | structure and additional observations |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  | 1           | 2 | 3 |         |       |                           |    |              |             |                       | soil type: plasticity or particle characteristics, colour, secondary and minor components. |  |  |                    |  |  |  |  |                       |  |                    |                            | kPa                 |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
| ADT                       |  |             |   |   | N       |       |                           | -2 |              |             | SM                    | SILTY SAND: fine to medium grained, dark grey, trace of organics.                          |  |  |                    |  |  |  |  |                       |  | M                  | L                          |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | SP                    | SAND: fine to medium grained, grey.                                                        |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | SP                    | SAND: fine to medium grained, grey and brown, trace of clay fines.                         |  |  |                    |  |  |  |  |                       |  | M/W                |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | SC                    | CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines.            |  |  |                    |  |  |  |  |                       |  | M                  | MD                         |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | SC                    | CLAYEY SAND: fine to medium grained, pale grey and orange, medium plasticity fines.        |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    | VSt                        |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | CH                    | SILTY CLAY: high plasticity, pale grey and orange, with fine grained sand.                 |  |  |                    |  |  |  |  |                       |  |                    |                            | X                   |  |  | DIST PP=220kPa                        |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | CH                    | SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.                       |  |  |                    |  |  |  |  |                       |  |                    |                            | X                   |  |  | DIST PP=250kPa                        |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       | ...colour changing to pale grey and red.                                                   |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            | X                   |  |  | DIST PP=340kPa                        |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             | SP                    | SAND: fine to medium grained, pale grey, trace of clay fines.                              |  |  |                    |  |  |  |  |                       |  | W                  | D                          |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       | Borehole BH10 terminated at 6m                                                             |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  | LIMIT OF INVESTIGATION                |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                           |    |              |             |                       |                                                                                            |  |  |                    |  |  |  |  |                       |  |                    |                            |                     |  |  |                                       |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |

# Engineering Log - Borehole

Borehole No. **BH11**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting: |             |   |   |         |                                                                                   | EDSON CPI                       |    | Easting:           |                                                                                   | 509495.374               |                                                                                                                                                                                                   | slope:                |                               | -90°                                                                                 |                                          | R.L. Surface: |  | 3.650          |  |
|---------------------------|-------------|---|---|---------|-----------------------------------------------------------------------------------|---------------------------------|----|--------------------|-----------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|--------------------------------------------------------------------------------------|------------------------------------------|---------------|--|----------------|--|
| hole diameter:            |             |   |   |         |                                                                                   | 100 mm                          |    | Northing:          |                                                                                   | 7035133.363              |                                                                                                                                                                                                   | bearing:              |                               |                                                                                      |                                          | datum:        |  | GDA94          |  |
| drilling information      |             |   |   |         |                                                                                   |                                 |    | material substance |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
| method                    | penetration |   |   | support | water                                                                             | notes<br>samples,<br>tests, etc | RL | depth<br>metres    | graphic log                                                                       | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                                                     | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa                                                   | structure and<br>additional observations |               |  |                |  |
|                           | 1           | 2 | 3 |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
| ADT                       |             |   |   | N       |  | ASS                             | -3 | 1                  |  | SM                       | SILTY SAND: fine to medium grained, grey, trace of organics.                                                                                                                                      | M                     | L                             |  | DIST PP=250kPa                           |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SP                       | SAND: fine to medium grained, pale grey.                                                                                                                                                          |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SP                       | SAND: fine to medium grained, brown, trace of fine grained gravel.                                                                                                                                | D/M                   | VD                            |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SP                       | SAND: fine to medium grained, pale brown/orange.<br>...colour changing to pale brown.                                                                                                             | M                     | D                             |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SC                       | CLAYEY SAND: fine to medium grained, pale brown/orange and pale grey, medium plasticity fines.                                                                                                    | M                     |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | CH                       | SANDY CLAY: high plasticity, pale grey and orange, fine grained sand.<br><br>...medium to high plasticity, pale grey and red, fine to medium grained sand.<br><br>...fine to coarse grained sand. |                       | VSt                           |                                                                                      |                                          | X             |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          | X             |  | DIST PP=300kPa |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |
|                           |             |   |   |         | </                                                                                |                                 |    |                    |                                                                                   |                          |                                                                                                                                                                                                   |                       |                               |                                                                                      |                                          |               |  |                |  |

Borehole No. **BH12**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509628.73 slope: -90° R.L. Surface: 3.672  
hole diameter: 100 mm Northing 7035225.86 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                   |
| ADT                  | 1           | 2 | 3 | N       |       | D                               |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey,<br>trace of organics.                                   | M                     | L                             | 100                                | DIST PP=260kPa<br><br>DIST PP=320kPa<br><br>DIST PP=160kPa |
|                      |             |   |   |         |       |                                 | 3  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     |                       |                               | 200                                |                                                            |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, brown.                                                                   |                       | D                             | 300                                |                                                            |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | ...colour changing to pale grey and brown.                                                                    | W                     | VD                            | 400                                |                                                            |
|                      |             |   |   |         |       |                                 | 2  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale<br>brown/orange and pale grey, medium plasticity fines.      | M                     | MD                            |                                    |                                                            |
|                      |             |   |   |         |       |                                 | 2  |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey, fine<br>grained sand.                                          |                       | VSt                           | X                                  |                                                            |
|                      |             |   |   |         |       |                                 | 1  |                 |             | CH                       | <b>SILTY CLAY:</b> high plasticity, grey, trace of fine<br>grained sand.                                      |                       |                               | X                                  |                                                            |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -1 |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale<br>grey, fine to medium grained sand.                      |                       | St                            |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -1 |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale<br>grey, medium plasticity fines.                            | W                     | MD                            | X                                  |                                                            |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH12 terminated at 6m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                                     |
|                      |             |   |   |         |       |                                 | -3 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -4 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | 8  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                            |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance<br>ranging to<br>refusal<br><b>water</b><br>10/1/98 water level<br>on date shown<br><br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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Borehole No. **BH14**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509565.138 slope: -90° R.L. Surface: 2.787  
hole diameter: 100 mm Northing 7035049.18 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |                        |
| ADT                  | 1 2 3       | N       |       |                                 |                    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |         |       |                                 |                    | 2               |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                     | L                             |                                    |                                          |                        |
|                      |             |         |       |                                 |                    | 1               |             | SP                       | SAND: fine to medium grained, grey.                                                                           |                       | L/MD                          |                                    |                                          |                        |
|                      |             |         |       |                                 |                    |                 |             | SP                       | SAND: fine to medium grained, grey, trace of silt.                                                            | D                     | VD                            |                                    |                                          |                        |
|                      |             |         |       |                                 |                    |                 |             | SP                       | SAND: fine to medium grained, dark brown, with silt.                                                          | M/W                   | MD                            |                                    |                                          |                        |
|                      |             |         |       |                                 |                    |                 |             | SC                       | CLAYEY SAND: fine to medium grained, brown, medium plasticity fines.                                          | W                     |                               |                                    |                                          |                        |
|                      |             |         |       |                                 |                    | 2               |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.                                | M                     | St                            | X                                  |                                          | DIST PP=160kPa         |
|                      |             |         |       |                                 |                    | 3               |             |                          |                                                                                                               |                       | VSt                           | X                                  |                                          | DIST PP=250kPa         |
|                      |             |         |       |                                 |                    | 4               |             |                          | ...fine to coarse grained sand and trace of fine grained gravel.                                              |                       |                               | X                                  |                                          | DIST PP=300kPa         |
|                      |             |         |       |                                 |                    | 5               |             | CH                       | SANDY SILTY CLAY: high plasticity, red and pale grey, fine to medium grained sand.                            |                       |                               | X                                  |                                          | DIST PP=280kPa         |
|                      |             |         |       |                                 |                    | 6               |             |                          |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |             |         |       |                                 |                    | 7               |             |                          | Borehole BH14 terminated at 6m                                                                                |                       |                               |                                    |                                          | LIMIT OF INVESTIGATION |
|                      |             |         |       |                                 |                    | 8               |             |                          |                                                                                                               |                       |                               |                                    |                                          |                        |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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# Engineering Log - Borehole

Borehole No. **BH15**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting: |             | EDSON CPI |   | Easting: 509730.812 |                    | slope: -90°                     |    | R.L. Surface: 2.543 |             |                          |                                                                                            |                       |                               |                                    |                                          |
|---------------------------|-------------|-----------|---|---------------------|--------------------|---------------------------------|----|---------------------|-------------|--------------------------|--------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| hole diameter:            |             | 100 mm    |   | Northing: 7035153.4 |                    | bearing:                        |    | datum: GDA94        |             |                          |                                                                                            |                       |                               |                                    |                                          |
| drilling information      |             |           |   |                     | material substance |                                 |    |                     |             |                          |                                                                                            |                       |                               |                                    |                                          |
| method                    | penetration |           |   | support             | water              | notes<br>samples,<br>tests, etc | RL | depth<br>metres     | graphic log | classification<br>symbol | material                                                                                   | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                           | 1           | 2         | 3 |                     |                    |                                 |    |                     |             |                          |                                                                                            |                       |                               |                                    |                                          |
| ADT                       |             |           |   | N                   |                    |                                 |    |                     |             |                          |                                                                                            | M                     | L                             |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 2                   |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                          |                       | L                             |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 1                   |             | SP                       | SAND: fine to medium grained, grey, trace of silt.                                         |                       | L/MD                          |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 1                   |             | SP                       | SAND: fine to medium grained, dark brown, trace of silt.                                   |                       | MD                            |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 1                   |             | CH                       | SANDY CLAY: high plasticity, pale grey and pale brown/orange, fine to medium grained sand. |                       | VSt                           |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 2                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 0                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 3                   |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey, fine to coarse grained sand.             |                       | St                            |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 4                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 5                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 6                   |             | CH                       | SANDY CLAY: high plasticity, pale grey/orange and red, fine to coarse grained sand.        |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 7                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 8                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 9                   |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 10                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 11                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 12                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 13                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 14                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 15                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 16                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 17                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 18                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 19                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 20                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 21                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 22                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 23                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 24                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 25                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 26                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 27                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 28                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 29                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 30                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 31                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 32                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 33                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 34                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 35                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 36                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 37                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 38                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 39                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 40                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 41                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 42                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 43                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 44                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 45                  |             |                          |                                                                                            |                       |                               |                                    |                                          |
|                           |             |           |   |                     |                    |                                 |    | 4                   |             |                          |                                                                                            |                       |                               |                                    |                                          |

Borehole No. **BH16**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting: EDSON CPI                                                                                                                                                                                    |             |   |   | Easting: 509152.052  |       | slope: -90°                     |    | R.L. Surface: 3.124 |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|----------------------|-------|---------------------------------|----|---------------------|-------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|----------------|-----|---|---|----|-------------------------------------------------------------------------|--------|---|----------------|---|---|----|------------------------------------------|---|----------------|
| hole diameter: 100 mm                                                                                                                                                                                                  |             |   |   | Northing 7035206.822 |       | bearing:                        |    | datum: GDA94        |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
| drilling information                                                                                                                                                                                                   |             |   |   |                      |       | material substance              |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
| method                                                                                                                                                                                                                 | penetration |   |   | support              | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres     | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                                                                        | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                                                                                                                                                                                                                                                                                                                 |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |                      |       |                                 |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
| ADT                                                                                                                                                                                                                    |             |   | N |                      |       | 3                               | 3  |                     |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                                                                                                                             | M/W                   | L                             | 100                                | 200                                                                                                                                                                                                                                                                                                                                                      | 300 | 400                    |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       |                                 |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  | D                                                                                                                                                                                   | 2 | 1 | CH | <b>SANDY CLAY:</b> medium plasticity, orange and pale grey, fine to medium grained sand.                                                                                                              | M | St | X | DIST PP=200kPa |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       |                                 |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                | ASS | 1 | 2 | CH | <b>SANDY SILTY CLAY:</b> high plasticity, pale grey, fine grained sand. | St/VSt | X | DIST PP=250kPa |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       |                                 |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                | 0 | 3 | CH | ...colour changing to pale grey and red. | X | DIST PP=240kPa |
|                                                                                                                                                                                                                        |             |   |   |                      |       |                                 |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | -1                              |    |                     |             |                          | Borehole BH16 terminated at 4m                                                                                                                                                                                       |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     | LIMIT OF INVESTIGATION |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | -2                              |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | -3                              |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | -4                              |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | 5                               |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | 6                               |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | 7                               |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
|                                                                                                                                                                                                                        |             |   |   |                      |       | 8                               |    |                     |             |                          |                                                                                                                                                                                                                      |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                          |     |                        |  |                                                                                                                                                                                     |   |   |    |                                                                                                                                                                                                       |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |                      |       |                                 |    |                     |             |                          | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br><br>10/1/98 water level on date shown<br><br>water inflow<br><br>water outflow |                       |                               |                                    | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |     |                        |  | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit |   |   |    | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |   |    |   |                |     |   |   |    |                                                                         |        |   |                |   |   |    |                                          |   |                |

Borehole No. **BH17**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509321.925 slope: -90° R.L. Surface: 6.130  
hole diameter: 100 mm Northing 7035385.16 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|----------------------------------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.          | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
| ADT                  |             |   |   | N       |       |                                 | 6  |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale brown/orange and red, fine to medium grained sand, trace of gravel. | M                     | St                            | X                                                              | FILL<br>DIST PP=150kPa                   |
|                      |             |   |   |         |       |                                 |    | 1               |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                               |                       | MD                            |                                                                | NATURAL                                  |
|                      |             |   |   |         |       |                                 | 5  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, brown, trace of silt.                                                             |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale brown, low plasticity fines, trace of gravel.                         | M/W                   |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | 4  | 2               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, orange/red and pale grey, fine to medium grained sand, trace of gravel.  | M                     | St                            | X                                                              | DIST PP=140kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | ...medium plasticity, colour changing to red and pale grey.                                                            |                       |                               | X                                                              | DIST PP=150kPa                           |
|                      |             |   |   |         |       |                                 | 3  | 3               |             |                          |                                                                                                                        |                       | VSt                           | X                                                              | DIST PP=220kPa                           |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                          | Borehole BH17 terminated at 4m                                                                                         |                       |                               |                                                                | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 |    | 5               |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 | -1 | 7               |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |
|                      |             |   |   |         |       |                                 |    | 8               |             |                          |                                                                                                                        |                       |                               |                                                                |                                          |

| method                                                                                   | support                                                                                                                                                                                                                                                             | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and<br>soil description<br>based on unified classification<br>system | consistency/density index                                                                                                                                         |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix<br>e.g. ADT | M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit         | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH18**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509520.833 slope: -90° R.L. Surface: 6.418  
hole diameter: 100 mm Northing 7035613.057 bearing: datum: GDA94

| drilling information                                                                                                                                                                                            |             |   |   |         |       | material substance                                                                                                                                          |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|-----|-----|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| method                                                                                                                                                                                                          | penetration |   |   | support | water | notes<br>samples,<br>tests, etc                                                                                                                             | RL                             | depth<br>metres                                                                                       | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                                                                                                                                                                                                                                                             | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa |     |     |                        | structure and<br>additional observations                                                                                                                                                    |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 | 1           | 2 | 3 |         |       |                                                                                                                                                             |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               | 100                                | 200 | 300 | 400                    |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
| ADT                                                                                                                                                                                                             |             | N | N | ASS     |       | 6                                                                                                                                                           | SM                             | SILTY SAND: fine to medium grained, dark brown, trace of organics.                                    | M           | MD                       | X                                                                                                             | X                                                                                                                                                                                                                                                                                                                                                 | X                             | DIST PP=160kPa                     |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 6                                                                                                                                                           | SP                             | SAND: fine to medium grained, grey/brown.                                                             |             | L                        |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 1                                                                                                                                                           | SP                             | SAND: fine to medium grained, pale brown, trace of clay fines.                                        | W           |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 1                                                                                                                                                           | SC                             | CLAYEY SAND: fine to medium grained, pale brown and orange, low plasticity fines.                     |             | L/MD                     |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 5                                                                                                                                                           | CH                             | SANDY CLAY: medium to high plasticity, orange/red and pale grey, fine to medium grained sand.         | M           | St                       |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 2                                                                                                                                                           | SC                             | CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, low plasticity fines.           | M/W         | MD                       |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 4                                                                                                                                                           | CH                             | SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.<br>...medium to high plasticity. | M           | VSt                      |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 3                                                                                                                                                           |                                |                                                                                                       |             | St                       |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 3                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 4                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 2                                                                                                                                                           | Borehole BH18 terminated at 4m |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     | LIMIT OF INVESTIGATION |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 5                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 1                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 6                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 0                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 7                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | -1                                                                                                                                                          |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |         |       | 8                                                                                                                                                           |                                |                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                                                                                                                                                                                   |                               |                                    |     |     |                        |                                                                                                                                                                                             |  |  |  |  |  |                                                                                                                                                                                                |  |  |  |  |  |
| method<br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         |       | support<br>M mud N nil<br>C casing<br>penetration<br>1 2 3 4<br><br>water<br><br>10/1/98 water level on date shown<br><br>water inflow<br><br>water outflow |                                |                                                                                                       |             |                          |                                                                                                               | notes, samples, tests<br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |                               |                                    |     |     |                        | classification symbols and<br>soil description<br>based on unified classification<br>system<br><br>moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |  |  |  |  |  | consistency/density index<br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |  |  |  |  |  |

Borehole No. **BH19**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **1.5.2009**Date completed: **1.5.2009**

Logged by: **DF**

Checked by:

| drill model and mounting: |             |   |   | EDSON CPI |       | Easting: 509311.852             |    | slope: -90°     |             | R.L. Surface: 3.410      |                                                                                                               |                       |                               |                                    |                                          |
|---------------------------|-------------|---|---|-----------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| hole diameter:            |             |   |   | 100 mm    |       | Northing: 7035155.992           |    | bearing:        |             | datum: GDA94             |                                                                                                               |                       |                               |                                    |                                          |
| drilling information      |             |   |   |           |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| method                    | penetration |   |   | support   | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                           | 1           | 2 | 3 |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                       |             |   |   | N         |       |                                 |    |                 |             |                          |                                                                                                               | M                     | L                             |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       | MD                            |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       | D                             |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               | W                     | VD                            |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       | D                             |                                    |                                          |
|                           |             |   |   |           |       | ASS                             |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

Borehole No. **BH20**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **21.4.2009**Date completed: **21.4.2009**

Logged by: **DF**

Checked by:

|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       |                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| drill model and mounting:                                                                                                                                                                                              |             |   |   |         |       | EDSON CPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | Easting: 509428.101                                                                                                                                                                                                                                                                                                                                      |             | slope: -90°              |                                                                                                               | R.L. Surface: 4.580                                                                                                                                                                                 |                               |                                                                                                                                                                                                       |                                          |
| hole diameter:                                                                                                                                                                                                         |             |   |   |         |       | 100 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    | Northing: 7035294.259                                                                                                                                                                                                                                                                                                                                    |             | bearing:                 |                                                                                                               | datum: GDA94                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
| drilling information                                                                                                                                                                                                   |             |   |   |         |       | material substance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       |                                          |
| method                                                                                                                                                                                                                 | penetration |   |   | support | water | notes<br>samples,<br>tests, etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | RL | depth<br>metres                                                                                                                                                                                                                                                                                                                                          | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                                                                                                               | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400                                                                                                                                        | structure and<br>additional observations |
| ADT                                                                                                                                                                                                                    | 1           | 2 | 3 | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |    |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | SILTY SAND: fine to medium grained, dark grey, with clay fines and trace of organics.                         | M                                                                                                                                                                                                   | MD                            |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       | D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -4 | 1                                                                                                                                                                                                                                                                                                                                                        |             | SP                       | SAND: fine to medium grained, grey, trace of silt and clay.                                                   | W                                                                                                                                                                                                   |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -3 | 2                                                                                                                                                                                                                                                                                                                                                        |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines, trace of gravel.              |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -2 | 3                                                                                                                                                                                                                                                                                                                                                        |             | CH                       | SANDY CLAY: high plasticity, pale grey and orange, fine to medium grained sand.                               | M                                                                                                                                                                                                   | VSt                           | x                                                                                                                                                                                                     | DIST PP=300kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -1 | 4                                                                                                                                                                                                                                                                                                                                                        |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey and pale brown, low plasticity fines.                          | W                                                                                                                                                                                                   | MD                            |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0  | 5                                                                                                                                                                                                                                                                                                                                                        |             | CL                       | SANDY CLAY: medium plasticity, pale brown/orange and red, fine to medium grained sand.                        | M                                                                                                                                                                                                   | St                            | x                                                                                                                                                                                                     | DIST PP=150kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -1 | 6                                                                                                                                                                                                                                                                                                                                                        |             | CH                       | SANDY CLAY: high plasticity, pale grey and red, fine grained sand.                                            |                                                                                                                                                                                                     |                               | x                                                                                                                                                                                                     | DIST PP=190kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -2 | 7                                                                                                                                                                                                                                                                                                                                                        |             |                          | Borehole BH20 terminated at 4m                                                                                |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -3 | 8                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       |                                          |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         |       | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow |    | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |             |                          |                                                                                                               | <b>classification symbols and soil description</b><br>based on unified classification system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |                               | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                                          |

# Engineering Log - Borehole

Borehole No. **BH21**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **17.4.2009**

Principal:

Date completed: **17.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting:                                                                                                                                                                                              |             |   |   |         | EDSON CPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                 | Easting: 509521.978                                                                                                                                                                                                                                                                                                                                      |                 | slope: -90° |                          | R.L. Surface: 4.879                                                                                           |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| hole diameter:                                                                                                                                                                                                         |             |   |   |         | 100 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 | Northing 7035416.072                                                                                                                                                                                                                                                                                                                                     |                 | bearing:    |                          | datum: GDA94                                                                                                  |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
| drilling information                                                                                                                                                                                                   |             |   |   |         | material substance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
| method                                                                                                                                                                                                                 | penetration |   |   | support | water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | notes<br>samples,<br>tests, etc | RL                                                                                                                                                                                                                                                                                                                                                       | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                                                                                                               | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                                                                                                                                                              |                        |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                                                                                                                                                                                                   | MD                            |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -4                                                                                                                                                                                                                                                                                                                                                       | 1               |             | SP                       | SAND: fine to medium grained, grey, trace of silt.<br><br>...colour changing to grey/brown.                   | M/W                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             |                          |                                                                                                               |                                                                                                                                                                                                     | D                             |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             |                          |                                                                                                               |                                                                                                                                                                                                     | VD                            |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale brown and pale grey, low plasticity fines.                          | M                                                                                                                                                                                                   | MD                            |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -3                                                                                                                                                                                                                                                                                                                                                       | 2               |             | CL                       | SANDY CLAY: medium plasticity, grey, fine to medium grained sand.                                             |                                                                                                                                                                                                     | St                            | x                                  |                                                                                                                                                                                                       | DIST PP=150            |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             | SC                       | CLAYEY SAND: fine to medium grained, grey, medium plasticity fines.                                           | W                                                                                                                                                                                                   | MD                            |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -2                                                                                                                                                                                                                                                                                                                                                       | 3               |             | CH                       | SILTY CLAY: high plasticity, pale grey, trace of sand.                                                        | M                                                                                                                                                                                                   | VSt                           | x                                  |                                                                                                                                                                                                       | DIST PP=220kPa         |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             | CH                       | SANDY CLAY: high plasticity, grey, fine to medium grained sand.                                               |                                                                                                                                                                                                     | St                            | x                                  |                                                                                                                                                                                                       | DIST PP=160kPa         |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -1                                                                                                                                                                                                                                                                                                                                                       | 4               |             | SC                       | CLAYEY SAND: fine to medium grained, grey, medium plasticity fines.                                           |                                                                                                                                                                                                     | MD                            |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                                                                                                                                                                                                                                                                                                                                                          |                 |             |                          | Borehole BH21 terminated at 4m                                                                                |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       | LIMIT OF INVESTIGATION |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | 0                                                                                                                                                                                                                                                                                                                                                        | 5               |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -1                                                                                                                                                                                                                                                                                                                                                       | 6               |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -2                                                                                                                                                                                                                                                                                                                                                       | 7               |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
|                                                                                                                                                                                                                        |             |   |   |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 | -3                                                                                                                                                                                                                                                                                                                                                       | 8               |             |                          |                                                                                                               |                                                                                                                                                                                                     |                               |                                    |                                                                                                                                                                                                       |                        |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow |                                 | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |                 |             |                          |                                                                                                               | <b>classification symbols and soil description</b><br>based on unified classification system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |                               |                                    | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                        |

Borehole No. **BH22**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509636.907 slope: -90° R.L. Surface: 5.440  
hole diameter: 100 mm Northing 7035571.222 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                     | L                             |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  |                 |             | SP                       | SAND: fine to medium grained, dark grey, trace of silt.                                                       |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SP                       | SAND: fine to medium grained, grey.<br>...colour changing to brown, with silt.                                | M/W                   |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | ...colour changing to pale brown and grey, with silt and trace of clay.                                       |                       | MD                            |                                    |                                          |
|                      |             |   |   |         | D     |                                 | 4  |                 |             |                          |                                                                                                               |                       | D                             |                                    |                                          |
|                      |             |   |   |         |       | ASS                             |    |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.                                      | M                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             | CH                       | SANDY CLAY: high plasticity, pale grey and orange, fine to medium grained sand.                               |                       | VSt                           | X                                  | DIST PP=280kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=350kPa                           |
|                      |             |   |   |         |       |                                 | 2  |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey, fine to coarse grained sand.                                  | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH22 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 1  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 8  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH23**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509330.049 slope: -90° R.L. Surface: 3.141  
hole diameter: 100 mm Northing 7035075.585 bearing: datum: GDA94

| drilling information |             |   |   |         |       |                                 | material substance |                 |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|----------------------|-------------|---|---|---------|-------|---------------------------------|--------------------|-----------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol                                                                                                                                                                              | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                                                                                                  |
| ADT                  | 1           | 2 | 3 | N       |       |                                 | 3                  |                 |             | SM                                                                                                                                                                                                    | <b>SILTY SAND:</b> fine to medium grained, dark grey,<br>trace of organics.                                   | M                     | MD                            | 100                                | <div>DIST PP=160kPa</div> <div>DIST PP=120kPa</div> <div>DIST PP=320kPa</div> <div>DIST PP=240kPa</div> <div>LIMIT OF INVESTIGATION</div> |
|                      |             |   |   |         |       |                                 |                    |                 | SP          | <b>SAND:</b> fine to medium grained, grey.<br>...fine to coarse grained, colour changing to dark<br>brown and brown, trace of gravel.<br>...fine to medium grained, colour changing to dark<br>brown. |                                                                                                               | D                     | 200                           |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | 2                  | 1               | CH          | <b>SANDY CLAY:</b> medium to high plasticity, pale<br>grey and orange, fine to medium grained sand.<br><br>...colour changing to pale grey.                                                           | W                                                                                                             | St                    | 300                           |                                    |                                                                                                                                           |
|                      |             |   |   |         | ASS   |                                 | 1                  | 2               |             |                                                                                                                                                                                                       | M                                                                                                             |                       | 400                           |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | 0                  | 3               |             |                                                                                                                                                                                                       |                                                                                                               | VSt                   |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | 4                  | 4               |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | -1                 |                 |             |                                                                                                                                                                                                       | Borehole BH23 terminated at 4m                                                                                |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 |                    | 5               |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | -2                 |                 |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 |                    | 6               |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | -3                 |                 |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 |                    | 7               |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 | -4                 |                 |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |
|                      |             |   |   |         |       |                                 |                    | 8               |             |                                                                                                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                                           |

| method                        | support     | notes, samples, tests                            | classification symbols and soil description | consistency/density index |
|-------------------------------|-------------|--------------------------------------------------|---------------------------------------------|---------------------------|
| AS auger screwing*            | M mud N nil | U <sub>50</sub> undisturbed sample 50mm diameter | based on unified classification system      | VS very soft              |
| AD auger drilling*            | C casing    | U <sub>63</sub> undisturbed sample 63mm diameter |                                             | S soft                    |
| RR roller/tricone             |             | D disturbed sample                               |                                             | F firm                    |
| W washbore                    |             | N standard penetration test (SPT)                |                                             | St stiff                  |
| CT cable tool                 |             | N* SPT - sample recovered                        |                                             | VSt very stiff            |
| HA hand auger                 |             | Nc SPT with solid cone                           |                                             | H hard                    |
| DT diatube                    |             | V vane shear (kPa)                               |                                             | Fb friable                |
| B blank bit                   |             | P pressuremeter                                  |                                             | VL very loose             |
| V V bit                       |             | Bs bulk sample                                   |                                             | L loose                   |
| T TC bit                      |             | E environmental sample                           |                                             | MD medium dense           |
| *bit shown by suffix e.g. ADT |             | R refusal                                        |                                             | D dense                   |
|                               |             |                                                  |                                             | VD very dense             |

# Engineering Log - Borehole

Borehole No. **BH24**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting: |                                                                                                            |    |                |                                                                  |       | EDSON CPI                       |    | Easting: 509432.876   |             | slope: -90°              |                                                                      | R.L. Surface: 3.970   |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|---------------------------|------------------------------------------------------------------------------------------------------------|----|----------------|------------------------------------------------------------------|-------|---------------------------------|----|-----------------------|-------------|--------------------------|----------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|----|------------------------------------------|-----|----|----------------------------------|---|----|
| hole diameter:            |                                                                                                            |    |                |                                                                  |       | 100 mm                          |    | Northing: 7035172.124 |             | bearing:                 |                                                                      | datum: GDA94          |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
| drilling information      |                                                                                                            |    |                |                                                                  |       | material substance              |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
| method                    | penetration                                                                                                |    |                | support                                                          | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres       | graphic log | classification<br>symbol | material                                                             | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |    |                                          |     |    |                                  |   |    |
|                           | 1                                                                                                          | 2  | 3              |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
| ADT                       |                                                                                                            |    | N              |                                                                  |       |                                 |    |                       |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics. | M                     | MD                            |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          | SP | SAND: fine to medium grained, pale grey. | M/W | VD |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    | ...colour changing to dark grey. | W | MD |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
| CH                        | SANDY CLAY: medium to high plasticity, pale<br>brown/orange and pale grey, fine to medium grained<br>sand. | X  | DIST PP=160kPa |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                | ...colour changing to pale grey, fine to coarse grained<br>sand. | X     | DIST PP=200kPa                  |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
| SC                        | CLAYEY SAND: fine to coarse grained, pale grey,<br>medium plasticity fines.                                | MD |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |
|                           |                                                                                                            |    |                |                                                                  |       |                                 |    |                       |             |                          |                                                                      |                       |                               |                                    |                                          |    |                                          |     |    |                                  |   |    |

Borehole No. **BH25**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **17.4.2009**

Principal:

Date completed: **17.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509566.743 slope: -90° R.L. Surface: 4.351  
hole diameter: 100 mm Northing 7035287.423 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 | 4  |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey/grey.                                                    | M                     | D                             |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey.<br><br>...colour changing to dark brown, trace of silt.            | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.   | M                     | St                            | X                                  | DIST PP=100kPa                           |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=120kPa                           |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=130kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                          |                                                                                                               |                       | VSt                           | X                                  | DIST PP=240kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=280kPa                           |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to coarse grained, pale grey, medium plasticity fines.                               | W                     | MD/D                          |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey, trace of clay fines.                                          |                       | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          | Borehole BH25 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -3 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 8  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# Engineering Log - Borehole

Borehole No. **BH26**

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

| drill model and mounting:                                                                                                                                                                                              |             |   |   |         |       | EDSON CPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    | Easting:        |             | 509688.974               |                                                                                                | slope:                                                                                                                                                                                                                                                                                                                                                   |                               | -90°                               |                          | R.L. Surface: |  | 3.873                                                                                                                                                                                           |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------|-------------|--------------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------|--------------------------|---------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| hole diameter:                                                                                                                                                                                                         |             |   |   |         |       | 100 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | Northing:       |             | 7035386.053              |                                                                                                | bearing:                                                                                                                                                                                                                                                                                                                                                 |                               |                                    |                          | datum:        |  | GDA94                                                                                                                                                                                           |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
| drilling information                                                                                                                                                                                                   |             |   |   |         |       | material substance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |                 |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
| method                                                                                                                                                                                                                 | penetration |   |   | support | water | notes<br>samples,<br>tests, etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | RL | depth<br>metres | graphic log | classification<br>symbol | material                                                                                       | moisture<br>condition                                                                                                                                                                                                                                                                                                                                    | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | 100<br>200<br>300<br>400 |               |  | structure and<br>additional observations                                                                                                                                                        |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey, with organics present.                          | M                                                                                                                                                                                                                                                                                                                                                        | L                             |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             | SP                       | SAND: fine to medium grained, dark grey, trace of silt.                                        | W                                                                                                                                                                                                                                                                                                                                                        |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -3 | 1               |             | SP                       | SAND: fine to medium grained, grey/brown, trace of silt.                                       | M                                                                                                                                                                                                                                                                                                                                                        | D/VD                          |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             | SP                       | SAND: fine to medium grained, pale grey, trace of clay.                                        | W                                                                                                                                                                                                                                                                                                                                                        | MD                            |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -2 | 2               |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, medium plasticity fines. | M                                                                                                                                                                                                                                                                                                                                                        |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |                 |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.                 |                                                                                                                                                                                                                                                                                                                                                          | St                            |                                    | X                        |               |  | DIST PP=160kPa                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             | CH                       | SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.                           |                                                                                                                                                                                                                                                                                                                                                          | VSt                           |                                    |                          | X             |  | DIST PP=280kPa                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -1 | 3               |             |                          | ...medium to high plasticity.                                                                  |                                                                                                                                                                                                                                                                                                                                                          | St                            |                                    | X                        |               |  | DIST PP=150kPa                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -0 | 4               |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    | X                        |               |  | DIST PP=140kPa                                                                                                                                                                                  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                 |             |                          | Borehole BH26 terminated at 4m                                                                 |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  | LIMIT OF INVESTIGATION                                                                                                                                                                          |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -1 | 5               |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -2 | 6               |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -3 | 7               |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -4 | 8               |             |                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                          |               |  |                                                                                                                                                                                                 |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         |       | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow |    |                 |             |                          |                                                                                                | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |                               |                                    |                          |               |  | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |  |  |  |  |  | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |  |  |  |  |  |

Borehole No. **BH28**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509427.641 slope: -90° R.L. Surface: 3.281  
hole diameter: 100 mm Northing 7035083.781 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|---------------------------|-------|----------------------------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.         | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>kPa | meter | structure and<br>additional observations     |
| ADT                  | 1 2 3       | N       |       |                                 | 3                  |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace or organics.                                              | M                     | MD                            |                           |       | DIST PP=150kPa<br><br>LIMIT OF INVESTIGATION |
|                      |             |         |       |                                 |                    | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, brown.<br><br>...colour changing to orange/brown, with silt and trace of gravel. | M/W                   |                               |                           |       |                                              |
|                      |             |         |       |                                 | 2                  |                 |             |                          | ...colour changing to dark grey/brown, trace of silt.                                                                 | M                     | D                             |                           |       |                                              |
|                      |             |         |       |                                 | 2                  |                 |             |                          |                                                                                                                       | W                     |                               |                           |       |                                              |
|                      |             |         |       |                                 | 1                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | 3                  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to coarse grained, pale grey, medium plasticity fines.                                       |                       | MD                            |                           |       | DIST PP=150kPa<br><br>LIMIT OF INVESTIGATION |
|                      |             |         |       |                                 | 0                  |                 |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine to coarse grained sand.                                         | M                     | St                            | X                         |       |                                              |
|                      |             |         |       |                                 | 4                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | -1                 |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | 5                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | -2                 |                 |             |                          |                                                                                                                       |                       |                               |                           |       | Borehole BH28 terminated at 6m               |
|                      |             |         |       |                                 | 6                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | -3                 |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | 7                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | -4                 |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |
|                      |             |         |       |                                 | 8                  |                 |             |                          |                                                                                                                       |                       |                               |                           |       |                                              |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# Engineering Log - Borehole

Borehole No. **BH29**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|-------------------------------|-------------|---|---|------------------|---------------------------------|----------------------------------|-----------------|--------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|----------------------------------------------------------------|------------------------------------------|
| drill model and mounting:     |             |   |   | EDSON CPI        |                                 | Easting: 509559.217              |                 | slope: -90°                                      |                          | R.L. Surface: 3.531                                                                                           |                       |                               |                                                                |                                          |
| hole diameter:                |             |   |   | 100 mm           |                                 | Northing: 7035174.326            |                 | bearing:                                         |                          | datum: GDA94                                                                                                  |                       |                               |                                                                |                                          |
| drilling information          |             |   |   |                  |                                 | material substance               |                 |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
| method                        | penetration |   |   | support<br>water | notes<br>samples,<br>tests, etc | RL                               | depth<br>metres | graphic log                                      | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations |
|                               | 1           | 2 | 3 |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
| ADT                           |             |   |   | N                |                                 |                                  |                 |                                                  |                          |                                                                                                               | M                     | MD                            |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               | M/W                   |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               |                       | VD                            |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 1               |                                                  |                          | SP                                                                                                            |                       | D                             |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          | SC                                                                                                            |                       | MD                            |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 2               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 2               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 1               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 3               |                                                  |                          | CL                                                                                                            |                       | St                            |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 0               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 4               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | -1              |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 5               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | -2              |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 6               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | -3              |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 7               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | -4              |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  | 8               |                                                  |                          |                                                                                                               |                       |                               |                                                                |                                          |
| method                        |             |   |   | support          |                                 | penetration                      |                 | notes, samples, tests                            |                          | classification symbols and soil description                                                                   |                       | consistency/density index     |                                                                |                                          |
| AS auger screwing*            |             |   |   | M mud N nil      |                                 | 1 2 3 4                          |                 | U <sub>50</sub> undisturbed sample 50mm diameter |                          | based on unified classification system                                                                        |                       | VS very soft                  |                                                                |                                          |
| AD auger drilling*            |             |   |   | C casing         |                                 | no resistance ranging to refusal |                 | U <sub>63</sub> undisturbed sample 63mm diameter |                          |                                                                                                               |                       | S soft                        |                                                                |                                          |
| RR roller/tricone             |             |   |   |                  |                                 |                                  |                 | D disturbed sample                               |                          |                                                                                                               |                       | F firm                        |                                                                |                                          |
| W washbore                    |             |   |   |                  |                                 |                                  |                 | N standard penetration test (SPT)                |                          |                                                                                                               |                       | St stiff                      |                                                                |                                          |
| CT cable tool                 |             |   |   |                  |                                 |                                  |                 | N* SPT - sample recovered                        |                          |                                                                                                               |                       | VSt very stiff                |                                                                |                                          |
| HA hand auger                 |             |   |   |                  |                                 |                                  |                 | Nc SPT with solid cone                           |                          |                                                                                                               |                       | H hard                        |                                                                |                                          |
| DT diatube                    |             |   |   |                  |                                 |                                  |                 | V vane shear (kPa)                               |                          |                                                                                                               |                       | Fb friable                    |                                                                |                                          |
| B blank bit                   |             |   |   |                  |                                 |                                  |                 | P pressuremeter                                  |                          |                                                                                                               |                       | VL very loose                 |                                                                |                                          |
| V V bit                       |             |   |   |                  |                                 |                                  |                 | Bs bulk sample                                   |                          |                                                                                                               |                       | L loose                       |                                                                |                                          |
| T TC bit                      |             |   |   |                  |                                 |                                  |                 | E environmental sample                           |                          |                                                                                                               |                       | MD medium dense               |                                                                |                                          |
| *bit shown by suffix e.g. ADT |             |   |   |                  |                                 |                                  |                 | R refusal                                        |                          |                                                                                                               |                       | D dense                       |                                                                |                                          |
|                               |             |   |   |                  |                                 |                                  |                 |                                                  |                          |                                                                                                               |                       | VD very dense                 |                                                                |                                          |

Borehole No. **BH30**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509680.433 slope: -90° R.L. Surface: 3.168  
hole diameter: 100 mm Northing 7035269.958 bearing: datum: GDA94

| drilling information |             |   |   |         |       |                                 | material substance |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|----------------------|-------------|---|---|---------|-------|---------------------------------|--------------------|-----------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|--------------------------------------------------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol                                                                                                                        | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                                             |
| ADT                  | 1           | 2 | 3 | N       |       |                                 | 3                  |                 |             | SM                                                                                                                                              | <b>SILTY SAND:</b> fine to medium grained, dark grey, with organics present.                                  | M                     | L                             | 100                                | DIST PP=150kPa<br><br>DIST PP=230kPa<br><br>DIST PP=220kPa<br><br><br>DIST PP=130kPa |
|                      |             |   |   |         |       |                                 |                    |                 | SP          | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                                                       |                                                                                                               |                       | 200                           |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 1                  |                 | SP          | <b>SAND:</b> fine to medium grained, dark brown, trace of silt.<br>...colour changing to brown.<br>...colour changing to pale brown.            | W                                                                                                             | D/V/D                 | 300                           |                                    |                                                                                      |
|                      |             |   |   |         | ASS   |                                 | 2                  |                 | CH          | <b>SILTY CLAY:</b> medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.<br>...colour changing to pale grey. | M                                                                                                             | St                    | 400                           |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                                                                                 |                                                                                                               | VSt                   | X                             |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 1                  |                 |             |                                                                                                                                                 |                                                                                                               |                       | X                             |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                                                                                 |                                                                                                               |                       | X                             |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 3                  |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 0                  |                 |             |                                                                                                                                                 |                                                                                                               | St                    | X                             |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 4                  |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -1                 |                 |             |                                                                                                                                                 | Borehole BH30 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                                                               |
|                      |             |   |   |         |       |                                 |                    | 5               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -2                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 6               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -3                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 7               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -4                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 8               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>water inflow<br>water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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Borehole No. **BH31**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509404.583 slope: -90° R.L. Surface: 2.542  
hole diameter: 100 mm Northing 7034963.245 bearing: datum: GDA94

| drilling information |             |   |   |         |       |                                 | material substance |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|--------------------|-----------------|-------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol                                                                      | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |                    |                 |             | SM                                                                                            | <b>SILTY SAND:</b> fine to medium grained, dark grey,<br>trace of organics.                                   | M                     | L                             |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 | SP          | <b>SAND:</b> fine to medium grained, grey.                                                    |                                                                                                               | M/W                   |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             | SP                                                                                            | <b>SAND:</b> fine to medium grained, brown, trace of<br>clay.                                                 | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 | CH          | <b>SANDY CLAY:</b> medium to high plasticity, grey<br>and brown, fine to medium grained sand. |                                                                                                               | M                     |                               | VSt                                |                                          |
|                      |             |   |   |         | D     |                                 |                    |                 |             | CH                                                                                            | <b>SANDY CLAY:</b> high plasticity, pale grey and red,<br>fine grained sand.                                  |                       |                               | X                                  | DIST PP=250kPa                           |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         | ASS   |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               | X                                  | DIST PP=280kPa                           |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               | ...fine to medium grained sand.                                                                               |                       |                               | X                                  | DIST PP=300kPa                           |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |
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|                      | </          |   |   |         |       |                                 |                    |                 |             |                                                                                               |                                                                                                               |                       |                               |                                    |                                          |

| method                                                                                   | support                                                                                                                                                                 | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and<br>soil description                               | consistency/density index                                                                                                                                         |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix<br>e.g. ADT | M mud<br>C casing<br>penetration<br>1 2 3 4<br>no resistance<br>ranging to<br>refusal<br>water<br>10/1/98 water level<br>on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH32**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

| drill model and mounting: |             |   |     |         |       |                                 |    |                                                                                |                                                                                                | EDSON CPI                      |                                                                                                               |                       |                               |                             |                |                |     |                                          |     | Easting: 509493.701    |  |  |  |  |  |  |  |  |  | slope: -90° |  |  |  |  |  |  |  |  |  | R.L. Surface: 2.600 |  |  |  |  |  |  |  |  |  |
|---------------------------|-------------|---|-----|---------|-------|---------------------------------|----|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|-----------------------------|----------------|----------------|-----|------------------------------------------|-----|------------------------|--|--|--|--|--|--|--|--|--|-------------|--|--|--|--|--|--|--|--|--|---------------------|--|--|--|--|--|--|--|--|--|
| hole diameter:            |             |   |     |         |       |                                 |    |                                                                                |                                                                                                | 100 mm                         |                                                                                                               |                       |                               |                             |                |                |     |                                          |     | Northing 7035010.479   |  |  |  |  |  |  |  |  |  | bearing:    |  |  |  |  |  |  |  |  |  | datum: GDA94        |  |  |  |  |  |  |  |  |  |
| drilling information      |             |   |     |         |       |                                 |    |                                                                                |                                                                                                | material substance             |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
| method                    | penetration |   |     | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres                                                                | graphic log                                                                                    | classification<br>symbol       | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter |                |                |     | structure and<br>additional observations |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           | 1           | 2 | 3   |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               | kPa                         | 100            | 200            | 300 |                                          | 400 |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
| ADT                       |             |   |     | ASS     |       |                                 |    | SM                                                                             | SILTY SAND: fine to medium grained, dark grey, trace of organics.                              | M                              | L                                                                                                             | X                     |                               |                             |                | DIST PP=110kPa |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    | SP                                                                             | SAND: fine to medium grained, grey, trace of silt.                                             | W                              |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                | ...colour changing to dark brown.                                                              |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    | SC                                                                             | CLAYEY SAND: fine to medium grained, grey, low plasticity fines.                               | M                              | MD                                                                                                            |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    | SC                                                                             | CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, medium plasticity fines. |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    | CH                                                                             | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.                 | St                             |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   | ASS |         |       |                                 | SC | CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.       | M/W                                                                                            | MD                             | X                                                                                                             |                       |                               |                             | DIST PP=120kPa |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 | CH | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand. | M                                                                                              | St                             |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 | SP | SAND: fine to medium grained, pale grey, with clay fines.                      | W                                                                                              | MD                             |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                | Borehole BH32 terminated at 4m |                                                                                                               |                       |                               |                             |                |                |     |                                          |     | LIMIT OF INVESTIGATION |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
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|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
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|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
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|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
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|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |
|                           |             |   |     |         |       |                                 |    |                                                                                |                                                                                                |                                |                                                                                                               |                       |                               |                             |                |                |     |                                          |     |                        |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |

Borehole No. **BH33**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|---------------------------|-------------|---|---|-----------|-------|---------------------------------|----|----------------------|-------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|----------------------------|-----|---------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|--------|-----|--|
| drill model and mounting: |             |   |   | EDSON CPI |       |                                 |    | Easting: 509617.391  |             |                          |                                                                                                                         | slope: -90°           |                               |                            |     | R.L. Surface: 2.728 |     |                                                                                                                                                                            |   |    |        |     |  |
| hole diameter:            |             |   |   | 100 mm    |       |                                 |    | Northing 7035092.444 |             |                          |                                                                                                                         | bearing:              |                               |                            |     | datum: GDA94        |     |                                                                                                                                                                            |   |    |        |     |  |
| drilling information      |             |   |   |           |       |                                 |    | material substance   |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
| method                    | penetration |   |   | support   | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres      | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.           | moisture<br>condition | consistency/<br>density index | pocket penetrometer<br>kPa |     |                     |     | structure and<br>additional observations                                                                                                                                   |   |    |        |     |  |
|                           | 1           | 2 | 3 |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               | 100                        | 200 | 300                 | 400 |                                                                                                                                                                            |   |    |        |     |  |
| ADT                       |             |   | N |           | ASS   | 2                               | 1  |                      | SM          | SP                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.<br>SAND: fine to medium grained, grey, trace of silt. | M                     | L                             |                            |     |                     |     | DIST PP=200kPa<br><br>DIST PP=220kPa<br><br><br><br><br><br><br><br><br><br>DIST PP=260kPa<br><br><br><br><br><br><br><br><br><br>DIST PP=300kPa<br>LIMIT OF INVESTIGATION |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            | W | MD | St/VSt | VSt |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       |                                 |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |
|                           |             |   |   |           |       | </                              |    |                      |             |                          |                                                                                                                         |                       |                               |                            |     |                     |     |                                                                                                                                                                            |   |    |        |     |  |

Borehole No. **BH34**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

| drill model and mounting: |             |   |   |         |       | EDSON CPI                       |    | Easting: 509680.634   |             | slope: -90°              |                                                                                                                                                                     | R.L. Surface: 2.649   |                               |                                                                |                                                          |
|---------------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|----------------------------------------------------------------|----------------------------------------------------------|
| hole diameter:            |             |   |   |         |       | 100 mm                          |    | Northing: 7035131.239 |             | bearing:                 |                                                                                                                                                                     | datum: GDA94          |                               |                                                                |                                                          |
| drilling information      |             |   |   |         |       | material substance              |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
| method                    | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres       | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                       | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations                 |
|                           | 1           | 2 | 3 |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
| ADT                       |             |   |   | N       |       | ASS                             |    |                       |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.<br>SAND: fine to medium grained, grey.<br><br>...colour changing to grey/brown, trace of silt. | M                     | L                             |                                                                | DIST PP=150kPa<br><br><br><br><br><br><br>DIST PP=220kPa |
|                           |             |   |   |         |       |                                 | SP |                       |             |                          |                                                                                                                                                                     |                       | MD                            |                                                                |                                                          |
|                           |             |   |   |         |       |                                 | SP |                       |             |                          | W                                                                                                                                                                   |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 | CH |                       |             |                          | M                                                                                                                                                                   | St                    |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 | CH |                       |             |                          |                                                                                                                                                                     | VSt                   |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 | SC |                       |             |                          | W                                                                                                                                                                   | MD                    |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                                                                                     |                       |                               |                                                                |                                                          |

Borehole No. **BH35**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

| drill model and mounting:                                                                                                                                                                                              |             |   |   | EDSON CPI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       | Easting: 509769.144                                                                                                                                                                                                                                                                                                                                      |    | slope: -90°     |             | R.L. Surface: 2.471                                                                                                                                                                                        |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------|------------------------------------------|
| hole diameter:                                                                                                                                                                                                         |             |   |   | 100 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | Northing: 7035180.815                                                                                                                                                                                                                                                                                                                                    |    | bearing:        |             | datum: GDA94                                                                                                                                                                                               |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
| drilling information                                                                                                                                                                                                   |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       | material substance                                                                                                                                                                                                                                                                                                                                       |    |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
| method                                                                                                                                                                                                                 | penetration |   |   | support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | water | notes<br>samples,<br>tests, etc                                                                                                                                                                                                                                                                                                                          | RL | depth<br>metres | graphic log | classification<br>symbol                                                                                                                                                                                   | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                                                                | moisture<br>condition                                                                                                                                                                                 | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
| ADT                                                                                                                                                                                                                    |             |   |   | N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              | M                                                                                                                                                                                                     | L                             |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -2 |                 |             | SM<br>SP                                                                                                                                                                                                   | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.<br>SAND: fine to medium grained, grey, trace of silt.<br><br>...fine to coarse grained.                                                 |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -1 |                 |             | SC<br>CH                                                                                                                                                                                                   | CLAYEY SAND: fine to coarse grained, grey and<br>brown, low plasticity fines.<br>SANDY CLAY: medium to high plasticity, pale<br>grey/brown, fine to medium grained sand.<br>...colour changing to pale grey. | W<br>M                                                                                                                                                                                                | MD<br>VSt                     |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       | ASS                                                                                                                                                                                                                                                                                                                                                      | -2 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               | X                                                              | DIST PP=250kPa                           |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -1 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               | X                                                              | DIST PP=240kPa                           |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 0  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -3 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               | X                                                              | DIST PP=280kPa                           |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -1 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               | X                                                              | DIST PP=300kPa                           |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 4  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -2 |                 |             |                                                                                                                                                                                                            | Borehole BH35 terminated at 4m                                                                                                                                                                               |                                                                                                                                                                                                       |                               |                                                                | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 5  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -3 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 6  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -4 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 7  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | -5 |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
|                                                                                                                                                                                                                        |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                          | 8  |                 |             |                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                                                                                                                                       |                               |                                                                |                                          |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance<br>ranging to<br>refusal<br><b>water</b><br> 10/1/98 water level<br>on date shown<br> water inflow<br> water outflow |       | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |    |                 |             | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |                                                                                                                                                                                                              | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                               |                                                                |                                          |

Borehole No. **BH36**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **1.5.2009**Date completed: **1.5.2009**

Logged by: **DF**

Checked by:

|                                                                                                                                                              |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  |                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| drill model and mounting: EDSON CPI                                                                                                                          |  |  |  |  |  |  |  |  |  | Easting: 509204.707                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | slope: -90°                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  | R.L. Surface: 2.801                                                                                                    |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| hole diameter: 100 mm                                                                                                                                        |  |  |  |  |  |  |  |  |  | Northing: 7035133.306                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | bearing:                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  | datum: GDA94                                                                                                           |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| drilling information                                                                                                                                         |  |  |  |  |  |  |  |  |  | material substance                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  |                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| <div><div>method</div><div>penetration</div><div>support</div><div>water</div><div>notes samples, tests, etc</div><div>RL</div><div>depth metres</div></div> |  |  |  |  |  |  |  |  |  | <div><div>graphic log</div><div>classification symbol</div><div>material</div><div>soil type: plasticity or particle characteristics, colour, secondary and minor components.</div><div>moisture condition</div><div>consistency/density index</div><div>pocket penetrometer</div><div>structure and additional observations</div></div> |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  |                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| ADT                                                                                                                                                          |  |  |  |  |  |  |  |  |  | SM<br>SP<br>SP<br>SC<br>CL<br>CH                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | SILTY SAND: fine to medium grained, dark grey, trace of organics.<br>SAND: fine to medium grained, grey.<br>SAND: fine to medium grained, brown, trace of silt.<br>CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines.<br>SANDY CLAY: medium plasticity, pale grey and red, fine to coarse grained sand.<br>SANDY CLAY: high plasticity, pale grey and red, fine to medium grained sand. |  |  |  |  |  |  |  |  |  | M<br>L<br>L/MD<br>D/VD<br>W<br>MD<br>M<br>VSt                                                                          |  |  |  |  |  |  |  |  |  | (BORDERLINE CLAYEY SAND)<br>DIST PP=240kPa<br>DIST PP=250kPa<br>DIST PP=380kPa                                                                                    |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                              |  |  |  |  |  |  |  |  |  | Borehole BH36 terminated at 3m                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | LIMIT OF INVESTIGATION                                                                                                 |  |  |  |  |  |  |  |  |  |                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| method                                                                                                                                                       |  |  |  |  |  |  |  |  |  | support                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | notes, samples, tests                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | classification symbols and soil description                                                                            |  |  |  |  |  |  |  |  |  | consistency/density index                                                                                                                                         |  |  |  |  |  |  |  |  |  |
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix e.g. ADT                                                                        |  |  |  |  |  |  |  |  |  | M mud<br>C casing<br>penetration<br>1 2 3 4<br>no resistance ranging to refusal<br>water<br>10/1/98 water level on date shown<br>water inflow<br>water outflow                                                                                                                                                                           |  |  |  |  |  |  |  |  |  | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal                                                                                             |  |  |  |  |  |  |  |  |  | based on unified classification system<br>moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit |  |  |  |  |  |  |  |  |  | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |  |  |  |  |  |  |  |  |  |

Borehole No. **BH37**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

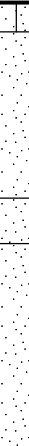
Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509273.373 slope: -90° R.L. Surface: 4.154  
hole diameter: 100 mm Northing 7035220.329 bearing: datum: GDA94

| drilling information                                                                                                                                                                                                   |                                                                                    |                                                                                    |                                                                                    |         |       | material substance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| method                                                                                                                                                                                                                 | penetration                                                                        |                                                                                    |                                                                                    | support | water | notes<br>samples,<br>tests, etc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | RL | depth<br>metres                                                                                                                                                                                                                                                                                                                                          | graphic log                                                                         | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition                                                                                                                                                                                  | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa                                                                                                                                                                    | structure and<br>additional observations |
|                                                                                                                                                                                                                        | 1                                                                                  | 2                                                                                  | 3                                                                                  |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
| ADT                                                                                                                                                                                                                    |  |  |  | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4  |                                                                                                                                                                                                                                                                                                                                                          |   | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                                                                                                                                                                                                      | L                             |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 1                                                                                                                                                                                                                                                                                                                                                        |   | SP                       | SAND: fine to medium grained, grey, trace of silt.                                                            |                                                                                                                                                                                                        | L/MD                          |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          | ...colour changing to dark grey.                                                                              |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          | ...colour changing to brown.                                                                                  |                                                                                                                                                                                                        | VD                            |                                                                                                                                                                                                       | INDURATED SAND                           |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | SP                       | SAND: fine to medium grained, dark brown, with silt.                                                          | M/W                                                                                                                                                                                                    | MD                            |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     | SP                       | SAND: fine to medium grained, pale grey and grey.                                                             | W                                                                                                                                                                                                      |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          | ...colour changing to dark brown.                                                                             |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 3                                                                                                                                                                                                                                                                                                                                                        |  |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1  |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          | Borehole BH37 terminated at 3m                                                                                |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 4                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0  |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 5                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -1 |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 6                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -2 |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 7                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -3 |                                                                                                                                                                                                                                                                                                                                                          |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |                                                                                    |                                                                                    |                                                                                    |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 8                                                                                                                                                                                                                                                                                                                                                        |                                                                                     |                          |                                                                                                               |                                                                                                                                                                                                        |                               |                                                                                                                                                                                                       |                                          |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |                                                                                    |                                                                                    |                                                                                    |         |       | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance<br>ranging to<br>refusal<br><b>water</b><br> 10/1/98 water level<br>on date shown<br> water inflow<br> water outflow |    | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |                                                                                     |                          |                                                                                                               | <b>classification symbols and<br/>soil description</b><br>based on unified classification<br>system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |                               | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                                          |

Borehole No. **BH38**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509348.703 slope: -90° R.L. Surface: 4.929  
hole diameter: 100 mm Northing 7035309.243 bearing: datum: GDA94

| drilling information |             |         |       | material substance              |    |                 |             |                          |                                                                                                                |                       |                               |                                    |                                          |
|----------------------|-------------|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.  | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
| ADT                  | 1 2 3       | N       |       |                                 |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, grey, trace of organics.                                            | M                     | MD                            |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, pale brown.                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             |                          | ...colour changing to brown.                                                                                   | D/M                   | D                             |                                    | CEMENTED                                 |
|                      |             |         |       |                                 |    |                 |             |                          | ...colour changing to dark brown.                                                                              |                       |                               |                                    |                                          |
|                      |             |         |       | ASS                             | 4  | 1               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale brown/orange, fine to medium grained sand, trace of gravel. | M/W                   | St                            | X                                  | DIST PP=90kPa                            |
|                      |             |         |       |                                 | 3  | 2               |             |                          | ...colour changing to orange.                                                                                  |                       |                               | X                                  | DIST PP=100kPa                           |
|                      |             |         |       |                                 |    |                 |             |                          | ...colour changing to orange and pale grey.                                                                    |                       |                               | X                                  | DIST PP=150kPa                           |
|                      |             |         |       |                                 | 2  | 3               |             |                          | ...colour changing to orange/red and pale grey, fine to coarse grained sand.                                   |                       |                               | X                                  | DIST PP=160kPa                           |
|                      |             |         |       |                                 |    |                 |             |                          | Borehole BH38 terminated at 3m                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |         |       |                                 | 1  | 4               |             |                          |                                                                                                                |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | 0  | 5               |             |                          |                                                                                                                |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | -1 | 6               |             |                          |                                                                                                                |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | -2 | 7               |             |                          |                                                                                                                |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | -3 | 8               |             |                          |                                                                                                                |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH39**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **17.4.2009**

Principal:

Date completed: **17.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509443.453 slope: -90° R.L. Surface: 5.250  
hole diameter: 100 mm Northing 7035404.116 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres                                                                   | graphic log                                                                       | classification<br>symbol                                                        | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 | 5  |                                                                                   |  | SC                                                                              | <b>SILTY CLAYEY SAND:</b> fine to medium grained, dark grey/brown, low plasticity fines, trace of gravel.     | M                     | VD                            |                                    | DIST PP=120kPa                           |
|                      |             |   |   |         |       |                                 |    |  | SC                                                                                | <b>CLAYEY SAND:</b> fine to medium grained, dark grey, medium plasticity fines. |                                                                                                               | MD                    |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |  | CL                                                                                | <b>SANDY CLAY:</b> medium plasticity, dark grey, fine to medium grained sand.   |                                                                                                               | St                    | X                             |                                    |                                          |
|                      |             |   |   |         | ▶     | ASS                             | 4  |                                                                                   |  |                                                                                 | ...colour changing to pale brown/orange and grey.                                                             |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                                                                                   |  | SP                                                                              | <b>SAND:</b> fine to medium grained, pale grey, with clay fines.<br>...trace of clay fines.                   | W                     | MD                            |                                    | DIST PP=180kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                                                                                   |  | SC                                                                              | <b>CLAYEY SAND:</b> fine to medium grained, pale grey, medium plasticity fines.                               |                       | St                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |  | CL                                                                                | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine to coarse grained sand.   | M                                                                                                             | VSt                   | X                             |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                                                                                   |                                                                                   |                                                                                 | Borehole BH39 terminated at 3m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 4  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 0  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 8  |                                                                                   |                                                                                   |                                                                                 |                                                                                                               |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH40**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509487.436 slope: -90° R.L. Surface: 5.401  
hole diameter: 100 mm Northing 7035480.836 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|----------------------------------------------------------------------------------|--|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material                                                                                                             | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                                         |  |
| ADT                  | 1 2 3       | N       |       |                                 |                    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                                 | M                     | MD                            |                                    | DIST PP=150kPa<br>DIST PP=310kPa<br><br>DIST PP=250kPa<br>LIMIT OF INVESTIGATION |  |
|                      |             |         |       |                                 | 5                  |                 |             | SP                       | SAND: fine to medium grained, grey.<br><br>...colour changing to pale grey.<br><br>...colour changing to dark brown. | W                     |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 1                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 4                  |                 |             | SC                       | CLAYEY SAND: fine to medium grained, grey,<br>low plasticity fines.                                                  |                       | D                             |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 2                  |                 |             | CL                       | SANDY CLAY: medium plasticity, pale grey, fine<br>to coarse grained sand.                                            | M                     | St                            |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 3                  |                 |             | CH                       | SANDY CLAY: medium to high plasticity, pale<br>grey/orange, fine to medium grained sand.                             |                       | VSt                           |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 3                  |                 |             |                          | Borehole BH40 terminated at 3m                                                                                       |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 2                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 4                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 1                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 5                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 0                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 6                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | -1                 |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 7                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | -2                 |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |
|                      |             |         |       |                                 | 8                  |                 |             |                          |                                                                                                                      |                       |                               |                                    |                                                                                  |  |

| method                                                                                   | support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and<br>soil description                                                                                       | consistency/density index                                                                                                                                         |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix<br>e.g. ADT | M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance<br>ranging to<br>refusal<br><b>water</b><br> 10/1/98 water level<br>on date shown<br> water inflow<br> water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | based on unified classification<br>system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH41**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **18.4.2009**Date completed: **18.7.2009**

Logged by: **DF**

Checked by:

|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              |    |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---|---|---------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| drill model and mounting:                                                                                                                                                                                              |             |   |   |         |       | EDSON CPI                                                                                                                                                                                                    |    | Easting: 509556.647   |                                                                                                                                                                                                                                                                                                                                                          | slope: -90°              |                                                                                                                              | R.L. Surface: 5.797   |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
| hole diameter:                                                                                                                                                                                                         |             |   |   |         |       | 100 mm                                                                                                                                                                                                       |    | Northing: 7035558.052 |                                                                                                                                                                                                                                                                                                                                                          | bearing:                 |                                                                                                                              | datum: GDA94          |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
| drilling information                                                                                                                                                                                                   |             |   |   |         |       | material substance                                                                                                                                                                                           |    |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
| method                                                                                                                                                                                                                 | penetration |   |   | support | water | notes<br>samples,<br>tests, etc                                                                                                                                                                              | RL | depth<br>metres       | graphic log                                                                                                                                                                                                                                                                                                                                              | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations                                                                                                                                                            |                                                                        |  |                                                                                                                                                                                                       |  |  |
| ADT                                                                                                                                                                                                                    | 1           | 2 | 3 | N       | ▲     | ASS                                                                                                                                                                                                          | 5  | 1                     |                                                                                                                                                                                                                                                                                                                                                          | SM                       | SILTY SAND: fine to medium grained, grey, trace of organics.                                                                 | M                     | MD                            |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              |    |                       |                                                                                                                                                                                                                                                                                                                                                          | SP                       | SAND: fine to medium grained, brown.<br>...colour changing to pale grey.<br>...colour changing to dark brown, trace of silt. | W                     | D                             |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              |    |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       | VD                            |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              |    |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       | SC                            |                                                                |                                                                                                                                                                                                     | CLAYEY SAND: fine to medium grained, grey/brown, low plasticity fines. |  | MD                                                                                                                                                                                                    |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | 3  | 3                     |                                                                                                                                                                                                                                                                                                                                                          | CH                       | SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.                                                         | M                     | VSt                           | x                                                              | DIST PP=300kPa                                                                                                                                                                                      |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | 2  | 4                     |                                                                                                                                                                                                                                                                                                                                                          |                          | Borehole BH41 terminated at 3m                                                                                               |                       |                               |                                                                | LIMIT OF INVESTIGATION                                                                                                                                                                              |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | 1  | 5                     |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | 0  | 6                     |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | -1 | 7                     |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                              | -2 | 8                     |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                              |                       |                               |                                                                |                                                                                                                                                                                                     |                                                                        |  |                                                                                                                                                                                                       |  |  |
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT |             |   |   |         |       | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br>10/1/98 water level on date shown<br>▲ water inflow<br>▶ water outflow |    |                       | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |                          |                                                                                                                              |                       |                               |                                                                | <b>classification symbols and soil description</b><br>based on unified classification system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>W <sub>L</sub> liquid limit |                                                                        |  | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |  |  |

Borehole No. **BH42**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509618.281 slope: -90° R.L. Surface: 6.407  
hole diameter: 100 mm Northing 7035632.379 bearing: datum: GDA94

| drilling information |             |   |   |         |       |                                 | material substance |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|----------------------|-------------|---|---|---------|-------|---------------------------------|--------------------|-----------------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|--|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log                                                                         | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                                  | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |  |
| ADT                  | 1           | 2 | 3 | N       |       |                                 |                    |                 |    | CL                       | <b>GRAVELLY SANDY CLAY:</b> low plasticity, pale brown and grey, fine to coarse sand and gravel.<br><b>SILTY SAND:</b> fine to medium grained, dark grey, trace of clay fines. | M                     | St                            | 100                                | FILL                                     |  |
|                      |             |   |   |         |       |                                 | 6                  |                 | SM                                                                                  |                          |                                                                                                                                                                                | D                     | 200                           | NATURAL                            |                                          |  |
|                      |             |   |   |         | ▲     |                                 |                    | 1               |    | SP                       | <b>SAND:</b> fine to medium grained, dark brown/brown, trace of silt and clay fines.<br>...colour changing to pale brown.                                                      | M/W                   | MD                            |                                    | DIST PP=130kPa                           |  |
|                      |             |   |   |         |       |                                 | 5                  |                 |    | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.                                                                    | M                     | St                            | x                                  |                                          |  |
|                      |             |   |   |         |       |                                 |                    | 2               |    | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale brown/orange and pale grey, low plasticity fines.                                                                             | W                     | MD                            |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 4                  |                 |   |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 |                    | 3               |  | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.                                                                               | M                     | St                            | x                                  | DIST PP=150kPa                           |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                     |                          | Borehole BH42 terminated at 3m                                                                                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |  |
|                      |             |   |   |         |       |                                 | 3                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 4                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 2                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 5                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 1                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 6                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 0                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 7                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | -1                 |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |
|                      |             |   |   |         |       |                                 | 8                  |                 |                                                                                     |                          |                                                                                                                                                                                |                       |                               |                                    |                                          |  |

| method                                                                                | support                                                                                                                 | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and soil description                                                                                | consistency/density index                                                                                                                                         |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix e.g. ADT | M mud<br>C casing<br>penetration 1 2 3 4<br>water<br>10/1/98 water level on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | based on unified classification system<br><br>moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH44**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509372.387 slope: -90° R.L. Surface: 3.591  
hole diameter: 100 mm Northing 7035128.667 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|--|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |  |
| ADT                  | 1 2 3       | N       |       |                                 |                    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                          | M                     | MD                            |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 3               |             | SP                       | SAND: fine to medium grained, pale grey/brown,<br>trace of silt.                                              | M/W                   |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 1               |             | SC                       | CLAYEY SAND: fine to medium grained, dark<br>brown, low plasticity fines.                                     | M                     |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 2               |             | SP                       | SAND: fine to medium grained, grey/brown.<br>...colour changing to grey.                                      |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 2               |             | SP                       | SAND: fine to coarse grained, pale grey, trace of<br>clay fines.                                              | W                     |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 1               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 3               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 0               |             |                          | Borehole BH44 terminated at 3m                                                                                |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 4               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | -1              |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 5               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | -2              |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 6               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | -3              |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 7               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | -4              |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 8               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |

| method                                                                                   | support                                                                                                                                                                 | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and<br>soil description                                                                                | consistency/density index                                                                                                                                         |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix<br>e.g. ADT | M mud<br>C casing<br>penetration<br>1 2 3 4<br>no resistance<br>ranging to<br>refusal<br>water<br>10/1/98 water level<br>on date shown<br>water inflow<br>water outflow | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | based on unified classification<br>system<br><br>moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |

Borehole No. **BH45**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

|                           |           |          |             |          |      |               |       |
|---------------------------|-----------|----------|-------------|----------|------|---------------|-------|
| drill model and mounting: | EDSON CPI | Easting: | 509494.887  | slope:   | -90° | R.L. Surface: | 4.214 |
| hole diameter:            | 100 mm    | Northing | 7035236.499 | bearing: |      | datum:        | GDA94 |

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------|------------------------------------|------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                                                                                                                       | moisture<br>condition | consistency/<br>density index           | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 | 4  |                 |             | SM<br>SP                 | <b>SILTY SAND:</b> fine to medium grained, grey, trace of organics.<br><b>SAND:</b> fine to medium grained, grey/brown.<br><br>...colour changing to pale brown/orange.<br><br><br><br><br><br><br><br>...colour changing to brown. | M                     | MD<br><br>D<br>VD<br><br><br><br><br>MD | 100<br>200<br>300<br>400           |                                          |
|                      |             |   |   |         | ASS   |                                 | 2  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey and brown, low plasticity fines, trace of gravel.                                                                                                                             |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.                                                                                                                                    | M                     | St                                      | x                                  | DIST PP=180kPa                           |
|                      |             |   |   |         |       |                                 | 1  |                 |             |                          | Borehole BH45 terminated at 3m                                                                                                                                                                                                      |                       |                                         |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | -3 |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |
|                      |             |   |   |         |       |                                 | 8  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                                         |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                         |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud N nil<br>C casing<br><b>penetration</b><br>1 2 3 4<br> no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH46**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509595.979 slope: -90° R.L. Surface: 4.045  
hole diameter: 100 mm Northing 7035365.144 bearing: datum: GDA94

| drilling information |             |   |   |         |       | material substance              |    |                 |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |
|----------------------|-------------|---|---|---------|-------|---------------------------------|----|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------------------------|
| method               | penetration |   |   | support | water | notes<br>samples,<br>tests, etc | RL | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                         | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations                   |
| ADT                  | 1           | 2 | 3 | N       |       |                                 |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, grey, trace of organics.                                                                   | M                     | MD                            | 100                                | DIST PP=100kPa<br><br>DIST PP=100kPa<br><br>DIST PP=140kPa |
|                      |             |   |   | ▶       |       |                                 |    | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, grey/brown, trace of silt.                                                                       | W                     |                               | 200                                |                                                            |
|                      |             |   |   |         | ASS   |                                 | -3 | 1               |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale grey/orange and red, fine to medium grained sand.                                          | M                     | St                            | 300                                |                                                            |
|                      |             |   |   |         |       |                                 | -2 | 2               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and red, fine to medium grained sand.<br><br>...colour changing to pale grey. |                       |                               | 400                                |                                                            |
|                      |             |   |   |         |       |                                 | -1 | 3               |             |                          | Borehole BH46 terminated at 3m                                                                                                        |                       |                               |                                    | LIMIT OF INVESTIGATION                                     |
|                      |             |   |   |         |       |                                 | 0  | 4               |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -1 | 5               |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -2 | 6               |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 | -3 | 7               |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |
|                      |             |   |   |         |       |                                 |    | 8               |             |                          |                                                                                                                                       |                       |                               |                                    |                                                            |

Borehole No. **BH47**

# Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **26.4.2009**Date completed: **26.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|------------------------------------------------------------------------------------------|-------------|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------|-------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------|------------------------|
| drill model and mounting:                                                                |             |   |   | EDSON CPI                                                                                                                                                                                                                                             |       | Easting: 509628.376                                                                                                                                                                                                                                                                                                      |    | slope: -90°     |             | R.L. Surface: 4.395                                                                                                    |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
| hole diameter:                                                                           |             |   |   | 100 mm                                                                                                                                                                                                                                                |       | Northing 7035457.209                                                                                                                                                                                                                                                                                                     |    | bearing:        |             | datum: GDA94                                                                                                           |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
| drilling information                                                                     |             |   |   |                                                                                                                                                                                                                                                       |       | material substance                                                                                                                                                                                                                                                                                                       |    |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
| method                                                                                   | penetration |   |   | support                                                                                                                                                                                                                                               | water | notes<br>samples,<br>tests, etc                                                                                                                                                                                                                                                                                          | RL | depth<br>metres | graphic log | classification<br>symbol                                                                                               | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. |     | moisture<br>condition | consistency/<br>density index                                                                                                                                     | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |                        |
| ADT                                                                                      | 1           | 2 | 3 | N                                                                                                                                                                                                                                                     |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                        |                                                                                                               |     | M                     | L                                                                                                                                                                 |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 4  |                 |             | SM                                                                                                                     | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    | 1               |             | SP                                                                                                                     | SAND: fine to medium grained, grey, trace of silt.                                                            |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             | SP                                                                                                                     | SAND: fine to medium grained, brown, trace of silt.                                                           | M/W | MD/D                  |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 3  |                 |             |                                                                                                                        |                                                                                                               |     |                       | VD                                                                                                                                                                |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    | 2               |             | SP                                                                                                                     | SAND: fine to medium grained, dark brown, trace of silt.                                                      | D/M |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             | SC                                                                                                                     | CLAYEY SAND: fine to coarse grained, grey, medium plasticity fines.                                           | W   | MD                    |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 2  |                 |             | CH                                                                                                                     | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.                                | M   | VSt                   |                                                                                                                                                                   | x                                  | DIST PP=300kPa                           |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                        |                                                                                                               |     |                       | St                                                                                                                                                                | x                                  | DIST PP=150kPa                           |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 3  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          |    |                 |             |                                                                                                                        | Borehole BH47 terminated at 3m                                                                                |     |                       |                                                                                                                                                                   |                                    |                                          | LIMIT OF INVESTIGATION |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 1  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 4  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 0  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 5  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | -1 |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 6  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | -2 |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 7  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | -3 |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
|                                                                                          |             |   |   |                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                                                                                                                          | 8  |                 |             |                                                                                                                        |                                                                                                               |     |                       |                                                                                                                                                                   |                                    |                                          |                        |
| method                                                                                   |             |   |   | support                                                                                                                                                                                                                                               |       | notes, samples, tests                                                                                                                                                                                                                                                                                                    |    |                 |             | classification symbols and soil description                                                                            |                                                                                                               |     |                       | consistency/density index                                                                                                                                         |                                    |                                          |                        |
| AS<br>AD<br>RR<br>W<br>CT<br>HA<br>DT<br>B<br>V<br>T<br>*bit shown by suffix<br>e.g. ADT |             |   |   | M mud<br>C casing<br>penetration<br>1 2 3 4<br><br>no resistance ranging to refusal<br>water<br>10/1/98 water level on date shown<br>water inflow<br>water outflow |       | U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal |    |                 |             | based on unified classification system<br>moisture<br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit |                                                                                                               |     |                       | VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |                                    |                                          |                        |

Borehole No. **BH49**

# Engineering Log - Borehole

Sheet 1 of 1  
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509700.242 slope: -90° R.L. Surface: 4.094  
hole diameter: 100 mm Northing 7035440.237 bearing: datum: GDA94

| drilling information |             |         |       |                                 | material substance |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|----------------------|-------------|---------|-------|---------------------------------|--------------------|-----------------|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------|------------------------------------|------------------------------------------|
| method               | penetration | support | water | notes<br>samples,<br>tests, etc | RL                 | depth<br>metres | graphic log | classification<br>symbol | material<br><br>soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter<br>kPa | structure and<br>additional observations |
| ADT                  | 1 2 3       | N       |       |                                 | 4                  |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark brown, trace of organics.                                     | M                     | L                             |                                    |                                          |
|                      |             |         |       |                                 |                    | 1               |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     | M/W                   |                               |                                    |                                          |
|                      |             |         |       |                                 |                    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey.                                                               | W                     | MD                            |                                    |                                          |
|                      |             |         |       |                                 | 3                  |                 |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale brown/orange and pale grey, fine to medium grained sand.           | M                     | St                            | x                                  | DIST PP=140kPa                           |
|                      |             |         |       |                                 |                    | 2               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to coarse grained sand.                         |                       | St/VSt                        | x                                  | DIST PP=200kPa                           |
|                      |             |         |       |                                 | 2                  |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=240kPa                           |
|                      |             |         |       |                                 | 1                  |                 |             |                          | Borehole BH49 terminated at 3m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |         |       |                                 |                    | 4               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |                    | 5               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |                    | 6               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |                    | 7               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |                    | 8               |             |                          |                                                                                                               |                       |                               |                                    |                                          |

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| <b>method</b><br>AS auger screwing*<br>AD auger drilling*<br>RR roller/tricone<br>W washbore<br>CT cable tool<br>HA hand auger<br>DT diatube<br>B blank bit<br>V V bit<br>T TC bit<br>*bit shown by suffix<br>e.g. ADT | <b>support</b><br>M mud<br>C casing<br><b>penetration</b><br>1 2 3 4<br><br>no resistance ranging to refusal<br><b>water</b><br> 10/1/98 water level on date shown<br> water inflow<br> water outflow | <b>notes, samples, tests</b><br>U <sub>50</sub> undisturbed sample 50mm diameter<br>U <sub>63</sub> undisturbed sample 63mm diameter<br>D disturbed sample<br>N standard penetration test (SPT)<br>N* SPT - sample recovered<br>Nc SPT with solid cone<br>V vane shear (kPa)<br>P pressuremeter<br>Bs bulk sample<br>E environmental sample<br>R refusal | <b>classification symbols and soil description</b><br>based on unified classification system<br><b>moisture</b><br>D dry<br>M moist<br>W wet<br>Wp plastic limit<br>WL liquid limit | <b>consistency/density index</b><br>VS very soft<br>S soft<br>F firm<br>St stiff<br>VSt very stiff<br>H hard<br>Fb friable<br>VL very loose<br>L loose<br>MD medium dense<br>D dense<br>VD very dense |
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