

**BELLVISTA 2 – PRECINCT 2  
BELLVISTA BOULEVARD, CALOUNDRA**

**ACID SULFATE SOILS  
INVESTIGATIONS**

**BROWN CONSULTING (QLD) PTY LTD**

GEOTKPAR01560AA/E (Rev3)  
30 November 2010

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Brown Consulting (Qld) Pty Ltd  
P.O. Box 997  
Buddina Qld 4575

**Attention: Mr Brent Thomas**

Dear Sir,

**RE: Bellvista 2 – Precinct 2**  
**Bellvista Boulevard, Caloundra**  
**Acid Sulfate Soils Investigations**

Coffey Geotechnics Pty Ltd (Coffey) was commissioned by Mr Brent Thomas of Brown Consulting (Qld) Pty Ltd on behalf of Stockland Caloundra Downs Pty Ltd to undertake acid sulphate soils investigations and assessments for the proposed subdivision of the Precinct 2 of the Bellvista 2 residential development at Bellvista Boulevard, Caloundra. The investigations and assessments are set out in this report.

Should you wish to discuss any aspect of this report, please contact Ron McMahon in our Kunda Park office.

For and on behalf of Coffey Geotechnics Pty Ltd



**Ron McMahon**

Principal Engineer

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## 1 INTRODUCTION

Coffey Geotechnics Pty Ltd (Coffey) was commissioned by Mr Brent Thomas of Brown Consulting (Qld) Pty Ltd (Browns) on behalf of Stockland Caloundra Downs Pty Ltd to undertake acid sulphate soils (ASS) investigations and assessments for the proposed subdivision of Precinct 2 of the Bellvista 2 residential development at Bellvista Boulevard, Caloundra.

## 2 PROPOSED DEVELOPMENT

Precinct 2 of the proposed development involves an area of some 47.2 hectares subdivided into residential lots on the site. The residential precinct will be some 34.8 hectares in area. The works will include the placement of imported fill on the lots, the construction roads and the installation of services. Open drains between 2 and 4 metres deep will be constructed through and adjacent to the site. The proposed layout is shown in the development plan provided by Browns, a copy of which is attached.

## 3 FIELDWORK

Fieldwork was undertaken between 9<sup>th</sup> May and 19<sup>th</sup> May 2009 under the direction of a principal engineer from Coffey's Kunda Park office. A total of 10 boreholes were drilled to a depth of 6 metres, 6 boreholes to a depth of 4 metres and 6 boreholes to a depth of 3 metres on the site. An additional 8 boreholes were drilled immediately adjacent to the site on the southern side. Dynamic cone penetrometer (DCP) testing to depths up to 1.5 metres was conducted adjacent to each borehole. Borehole logs and DCP blow counts are attached in **Appendix A** together with explanation sheets defining the terms and symbols used. Borehole locations are shown in **Figure 1**. Three samples of subgrade soils were collected for CBR testing. The samples are identified by depth and borehole number.

Soils samples were collected at 0.25 metre depth intervals to depths between 3 and 4 metres in all boreholes. The samples are identified by depth and borehole number. Samples were placed in resealable plastic bags and chilled in the field. Selected samples were packed into oxygen impermeable bags for transport to the analytical laboratory.

A walkover inspection was conducted by engineers and soil scientists from Coffey's Kunda Park office. The topography and surface features were noted.

## 4 LABORATORY TESTING

Laboratory testing for ASS was undertaken at the analytical laboratories of BioTrack Pty Ltd at Highvale. The samples were taken at 0.25 metre depth intervals from seven boreholes in and adjacent to Precinct 2. In addition, samples from 16 boreholes in or adjacent to Precinct 1 were sent for screen testing.

The screen test method used was the peroxide oxidation method set out in the QASSIT Guidelines (1998). A total of 104 samples from within or immediately adjacent to Precinct 2 were tested by this method. The test certificates showing all results are attached in **Appendix B**.

The samples taken at 0.5 metre depth intervals from seven boreholes in Precinct 2 were sent for quantitative analyses. In addition, samples from 16 boreholes in Precinct 1. The quantitative test method was:

- the measurement of total actual acidity (TAA) and preoxidation sulfur (S<sub>kcl</sub>) to assess the nature and severity of the pre-existing acidity.
- the measurement of chromium reducible sulfur (S<sub>Cr</sub>) and residual acidity (s–NAS) to determine acid generating potential.

A total of 52 samples from within or immediately adjacent Precinct 2 were tested by this method. Test certificates showing all results are attached in **Appendix B**.

## 5 SITE CONDITIONS

### 5.1 Topography and Site Description

The Precinct 2 is a more or less triangular area off the western end of Bellvista Boulevard at Caloundra. It is on the northern side of Bellevista Boulevard..

Precinct 2 is at an elevation of about RL 3 to 5.5 metres AHD along the northern boundary to the west of Bellvista Boulevard and slopes down to the southeast away from the northern boundary with an average gradient less than 1% to an elevation of about RL 2 metres in the southern parts of the site.

The site has been previously cleared of the endemic vegetation. A dense exotic grass cover is established over the site. Larger woody vegetation is generally located around the boundary of Precinct 2 in the form of regrowth and limited to areas along the existing drainage lines. Tree species identified included *Pinus radiate*, *Acacia melanoxylon*, *Lophostemon suaveolens*, *Melaleuca quinquenervia* and various *Eucalyptus* species.

### 5.2 Geology and Geomorphology

According to the 1:100 000 Geological Series mapping, sheet 9444 and part 9544, prepared by the Department of Mines and Energy Queensland, the site is underlain by Quaternary alluvium (mapping unit Qa). This unit consists predominantly of sands and silty sands in this area. The alluvium is underlain at shallow depth by residual soils derived from the Late Triassic to Jurassic Landsborough Sandstones (mapping unit RJI). This sequence is predominately sandstone in this area.

### **5.3 Subsurface Profile**

The subsurface profile was inferred from the Coffey boreholes on the site. The soil profile generally consists of upper alluvial sand and silty sand strata overlying residual clayey sands and sands underlain by stiff residual sandy clays.

The upper sandy profile consists of a silty sand topsoil 200 mm to 300 mm thick overlying the subsoils. Organic matter was present in the topsoils but was a relatively small percentage of the soil mass at depths greater than 200 mm. The subsoils are medium dense to very dense sands and clayey sands. In some areas the subsoils are indurated. The depth of the upper sand strata varies from 0.6 metres deep to more than 2.9 metres deep overlying the residual clay soils.

The underlying sandy clays are derived from the in situ weathering of the Landsborough Sandstones and grade to sandstone with depth. The clays are stiff to very stiff in consistency. Laboratory testing was not undertaken but Coffey's experience with these clays and visual classification indicates that they have a high plasticity and are moderately reactive.

### **5.4 Hydrology**

Groundwater was recorded at depths generally between 0.1 and 1 metre in boreholes on the site. The groundwater appeared to be a perched water table in the upper sand profile which is underlain by the residual clay soils.

Investigations were undertaken during a period of higher than average rainfall and it may be that during drier periods, the groundwater trapped in the upper sands is transpired out of the profile or seeps vertically or laterally off the site. During periods of prolonged dry weather, it is expected that the groundwater in the upper parts of the site will not be present.

However, the site is relatively flat with slow surface drainage and the profile consists of sandy soil overlying low permeability clays. It should be anticipated that, during periods of prolonged heavy rainfall, the water table may be higher than that recorded in boreholes during these investigations. All structure and drain design and construction planning should anticipate the possibility of high groundwater levels.

## **6 ACID SULFATE SOIL ASSESSMENT**

### **6.1 Acid Sulfate Soil Hazards**

Acid sulfate soils (ASS) are soils that contain iron pyrites. The pyrite is formed under specific conditions. These conditions require the presence of iron, sulfur and organic matter and generally occur in alluvial and marine soils.

The pyrites oxidise when exposed to oxygen and will, when combined with water, form sulfuric acid. This normally occurs when soils are changed from anaerobic to aerobic conditions.

The sulfuric acid will leach out of the soil and may lower the pH of receiving waters, increase the levels of metals in the receiving waters (particularly iron and aluminium) and strip the natural neutralising capacity from the receiving waters. These consequences can have a serious impact on the receiving environment and its biosystem.

There are two basic types of ASS. These are actual acid sulfate soils (AASS) which are soils in which the pyrite has already been oxidised and sulfuric acid is present in the soil and potential ASS (PASS) where the pyrite is present but has not been oxidised. Both AASS and PASS have the potential to do environmental harm.

If ASS are present on the site, the proposed development could disturb these soils by:

- removal of ASS from below the surface to be placed in aerobic conditions above ground during the excavation of open drains in and adjacent to Precinct 2
- removal of ASS from below the surface to be placed in aerobic conditions above ground during the stripping of topsoil on the site
- excavation of ASS during trenching for services on the site
- displacement of ASS during fill placement on the site
- lowering of the groundwater through improved drainage which may allow the oxidation of in situ PASS

The investigations undertaken were designed to evaluate the nature and extent of any ASS risk posed by these mechanisms.

## 6.2 Zoning Possible Acid Sulfate Soil

A desktop review of the Department of Environment and Resource Management (DERM) ASS risk mapping indicates that the site has a low probability of ASS occurrence with the land between the RL 5m AHD contour and the outer limits of Holocene, estuarine ASS. The relevant parts of the risk map are shown in **Figure 2** attached.

Topographic mapping available through the Sunshine Coast Regional Council online mapping shows that part of the site is situated above RL 5m AHD, thus ASS is not likely to be present in these soils. Most of the site however is below RL 5 m and ASS may be present.

The site is underlain by residual soils derived from the Jurassic period. It can be reasonably assumed through previous experience with these soils and their historical formation that the residual soils on the site not likely to be ASS.

The residual soils across the site are overlain by alluvial sand and silty sand and occasional intrusions of sandy clay and clayey sand. Any potential or actual acid sulfate soils, if present, are likely to be confined to soils below 5m AHD and soils within the alluvial strata.

## 7 ANALYSIS OF ACID SULFATE SOIL TESTING

### 7.1 Screen Testing Analysis

Analyses of the soils were undertaken at the analytical laboratories of BioTrack Pty Ltd at Samford. All 104 samples from within or immediately adjacent to Precinct 2 were tested by the peroxide screen test method. The qualitative screen test results indicated low to high titratable actual acidity (TAA) with preoxidation pH generally in the range 4.8 to 7.2. Screen tests results also indicated low to high titratable peroxide acidity (TPA) and low to high sulfides possible in the soil profiles. Some 52 selected samples were further tested by definitive quantitative analyses to assess the nature of the acidity and to quantify the sulfur content.

### 7.2 Quantitative Testing Analyses

A total of 52 samples from Precinct 2 and the immediately adjacent area were further tested for actual acidity and potential sulfuric acidity by quantitative laboratory analyses. Actual acidity was measured by the total actual acidity (TAA) plus preoxidation sulfur (S kcl) methods. Acid generating potential was measured by using the chromium reducible sulfur (S Cr) method and residual acidity (s-NAS).

#### 7.2.1 Actual Acid Sulfate Soils (AASS)

Of the 52 samples selected for quantitative testing, the measured TAA values varied from 0 to more than 80 moles per tonne. More than half the samples showed TAA values above the QASSIT threshold of 18 moles per tonne which defines actual acidic soils. The preoxidation sulfur levels however were below 0.01% for all samples, the limit of registration for the test method. These soils are thus mildly acidic but the acid is not sulfuric. This is common in the older leached soils derived from the weathering of the sedimentary rock in coastal Queensland. The soils are not AASS (**nonAASS**).

#### 7.2.2 Potential Acid Sulfate Soils (PASS)

The oxidisable sulfur levels as measured by the chromium reducible sulfur method (S Cr) were less than or equal 0.01%, the limit of registration for the test method, for all samples. Similarly, s-NAS, a measure of the residual acidity, was below 0.01%, the limit of registration, for all samples. The QASSIT threshold for defining PASS is 0.03%S. The soils to be disturbed below 4.0m are thus not potential acid sulfate soils (**nonPASS**).

## **8 CONCLUSIONS AND RECOMMENDATIONS**

### **8.1 Actual Acidity**

Based on the laboratory results and borehole logs, all soils are nonAASS. They are thus not required to be managed as set out in the State Planning Policy SPP2/02. There is no requirement for the preparation of an ASS management plan.

However, the soils are acidic with an average natural non sulfuric acidity above the QASSIT threshold. This natural acidity left undisturbed would slowly leach out into the receiving environment causing no environmental harm (with the natural ecosystem adapted to such inputs). The Environmental Protection Act bestows a general environmental duty (GED) on all works. It is therefore recommended that some preventative treatment of excavated soils be undertaken. A draft guideline prepared by QASSIT suggests liming of the excavated soils and batters as a management tool. While the draft guideline does not require mixing of the lime and soil, Coffey suggests some mixing of the soil and lime by the excavator during digging and handling operations on the site.

The recommended liming rate for excavated soils is 4 kilograms fine agricultural lime per cubic metre. This requirement should be set out in the EMP for the site.

### **8.2 Potential Acidity**

Based on the laboratory results and borehole logs, the soils on the site are nonPASS and are not subject to the requirements of SPP2/02.

### **8.3 Further Investigations**

The detail of the investigation undertaken on the site is below that recommended in the QASSIT Guidelines (1998). Further investigation is not deemed necessary for the following reasons:

- A large number of boreholes (equivalent to the QASSIT Guideline recommended frequency) have been drilled on the site. These boreholes have indicated that the soil profiles are relatively consistent and no paleochannels or other potential ASS hotspots are present.
- The tested actual and potential sulphuric acidity in every sample analysed (52 in Precinct 2 and a further 86 in the adjacent areas) was below the limit or registration of the test method. The samples tested included upper alluvial sands and the underlying residual sandy clays. All samples were nonASS.
- Any excavations deeper than the depths investigated will be into residual soils derived from the in situ weathering of the underlying sandstones. Such soils are unlikely to be ASS and the testing has confirmed this.

- Most of the earthworks proposed for the site involve the placement of imported fill on the site. The site soils are all overconsolidated with respect to likely fill and structural loads. There will thus be no significant settlement. In addition, soil shear strengths are in excess of 50 kPa and there is no risk of soil heaving adjacent to fill areas. The concerns expressed in SPP2/02 are thus not an issue on this site because the soils are not ASS and the mechanisms for potential harm will not occur.
- Some earthworks will involve the disturbance of on site soils for service trenching and drain excavation. All soils likely to be disturbed have been shown by investigations to be nonASS.

It is thus suggested that further ASS investigation is not necessary and that this ASS investigation report be submitted for consideration based on the data currently available.

## 8.4 Final Comments

Based on the assessment of geology, geomorphology, topography, hydrology and laboratory testing, the proposed works on the site will not encounter AASS or PASS and the requirements of SPP2/02 do not apply. Some of the soils in their present state are slightly acidic (non-sulfuric) and disturbance of these soils could mobilise the acidity. Coffey recommends the management of these soils as set out in Section 8.1 of this report.

For and on behalf of Coffey Geotechnics Pty Ltd



**Ron McMahon**

Principal Engineer

## Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

### **Your report is based on project specific criteria**

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

### **Subsurface conditions can change**

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

### **Interpretation of factual data**

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by

earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

### **Your report will only give preliminary recommendations**

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

### **Your report is prepared for specific purposes and persons**

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

## Important information about your **Coffey** Report

### **Interpretation by other design professionals**

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

### **Data should not be separated from the report\***

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

### **Geoenvironmental concerns are not at issue**

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

### **Rely on Coffey for additional assistance**

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

### **Responsibility**

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

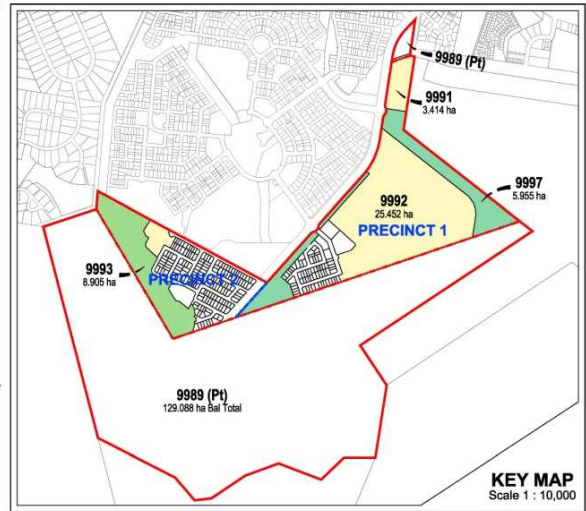
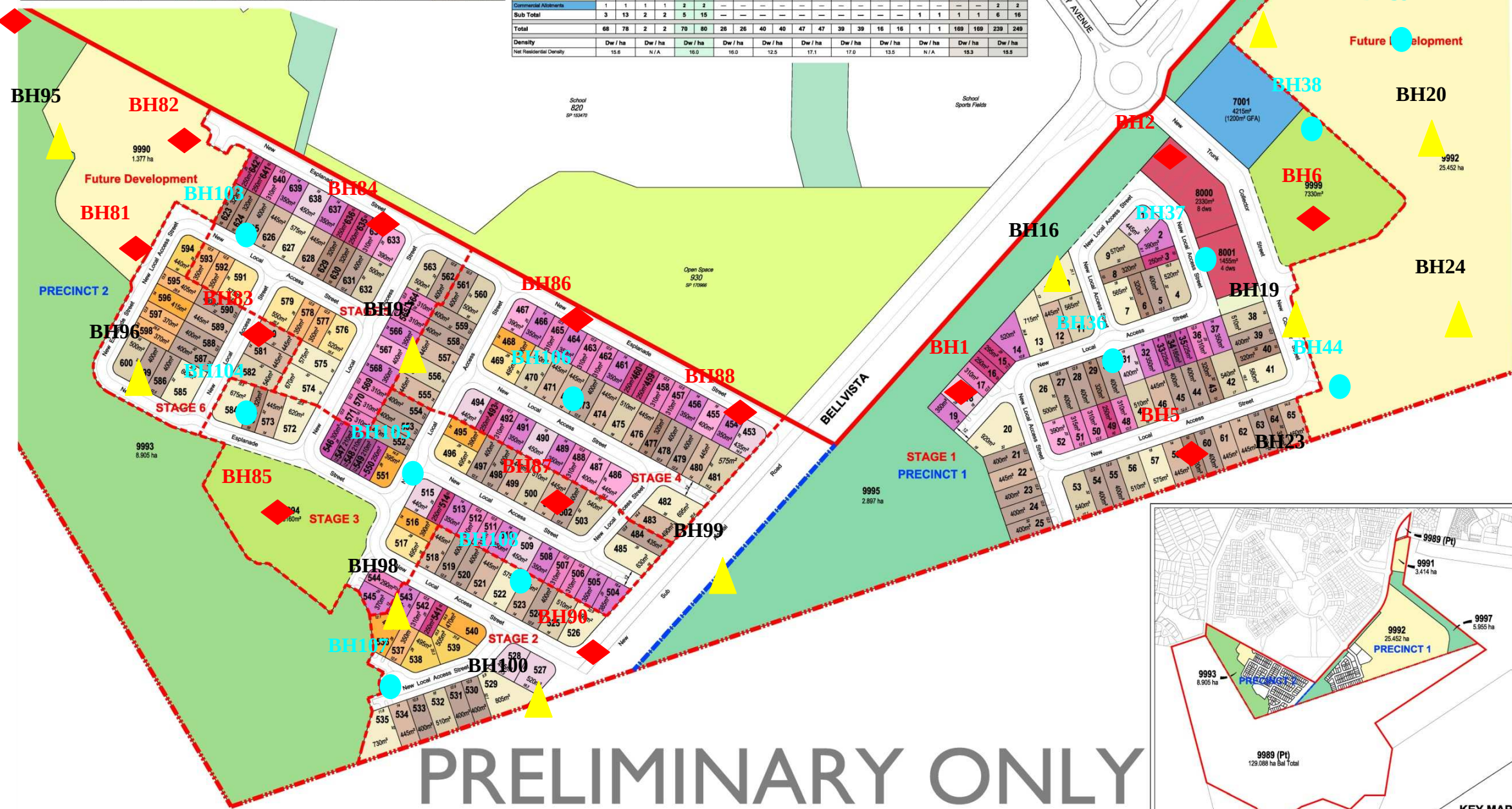
\* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

## Figures

| 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     | 2.716      | 2.807      | 3.191      | 2.743      | 2.295      | 1.194      | 33.832     | 45.852     | 9.393      |  |
| Single Family Allotments          | 2.716      | —          | 2.716      | 1.212      | 1.989      | 1.989      | 1.989      | 0.719      | —          | 6.899      | 9.393      |  |
| 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      | 1.989      | 1.989      | 0.719      | 27.876     | 34.766     | 39.860     |  |
| Road                              | —          | —          | —          | 0.967      | —          | —          | —          | —          | 0.967      | 0.967      | —          |  |
| Sub Arterial Road                 | —          | —          | —          | 0.967      | —          | —          | —          | —          | 0.967      | 0.967      | —          |  |
| 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      | 4.444      |  |
| 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      | 19.908     |  |
| 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        | 261        |  |
| Esplanade Street                  | 188        | —          | 188        | 252        | 212        | 212        | —          | —          | —          | 862        | 862        |  |
| Local Access Street               | 630        | —          | 630        | 226        | 291        | 292        | 198        | —          | —          | 1258       | 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 | Sub Total | Stage 2 | Stage 3 | Stage 4 | Stage 5 | Stage 6 | Balance | Sub Total | Total   |         |
| Product                         | Product | Product | Product   | Product | Product | Product | Product | Product | Product | Product   | Product |         |
| 25m Deep Product                | 1       | 2%      | —         | 1       | 3%      | —       | 0%      | 3       | 8%      | —         | 0%      | —       |
| Terrace 7.5m                    | 2       | 3%      | —         | 2       | 3%      | —       | 0%      | 2       | 5%      | —         | 0%      | —       |
| Terrace 8.0m                    | 4       | 6%      | —         | 4       | 6%      | —       | 0%      | 4       | 10%     | —         | 0%      | —       |
| Villa 10m                       | 5       | 8%      | —         | 5       | 8%      | —       | 0%      | 5       | 13%     | —         | 0%      | —       |
| Premium Villa 12.5m             | 6       | 8%      | —         | 6       | 8%      | —       | 0%      | 6       | 13%     | —         | 0%      | —       |
| Courtyard 14m                   | 1       | 2%      | —         | 1       | 3%      | —       | 0%      | 1       | 2%      | —         | 0%      | —       |
| Traditional 15m                 | 3       | 6%      | —         | 3       | 6%      | —       | 0%      | 3       | 6%      | —         | 0%      | —       |
| Premium Traditional 15m         | 3       | 6%      | —         | 3       | 6%      | —       | 0%      | 3       | 6%      | —         | 0%      | —       |
| Subtotal                        | 21      | 32%     | —         | 21      | 32%     | —       | 0%      | 24      | 51%     | —         | 0%      | —       |
| 28m Deep Product                | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Villa 10m                       | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Premium Villa 12.5m             | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Courtyard 14m                   | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Traditional 15m                 | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Premium Traditional 15m         | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| Subtotal                        | —       | 0%      | —         | —       | 0%      | —       | 0%      | —       | 0%      | —         | 0%      | —       |
| 32m Deep Product                | 7       | 11%     | —         | 7       | 11%     | —       | 0%      | 1       | 3%      | —         | 0%      | —       |
| Villa 10m                       | 15      | 23%     | —         | 15      | 23%     | —       | 0%      | 15      | 23%     | —         | 0%      | —       |
| Premium Villa 12.5m             | 7       | 11%     | —         | 7       | 11%     | —       | 0%      | 7       | 11%     | —         | 0%      | —       |
| Courtyard 14m                   | 9       | 14%     | —         | 9       | 14%     | —       | 0%      | 9       | 14%     | —         | 0%      | —       |
| Traditional 15m                 | 6       | 9%      | —         | 6       | 9%      | —       | 0%      | 6       | 9%      | —         | 0%      | —       |
| Premium Traditional 15m         | 44      | 68%     | —         | 44      | 68%     | —       | 0%      | 44      | 68%     | —         | 0%      | —       |
| Subtotal                        | 65      | 100%    | —         | 65      | 100%    | —       | 0%      | 65      | 100%    | —         | 0%      | —       |
| Total Residential Allotments    | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Super Lots                      | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Medium Density                  | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Balance Super Allotment         | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Commercial Allotments           | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Sub Total                       | —       | —       | —         | —       | —       | —       | —       | —       | —       | —         | —       | —       |
| Total                           | 68      | 78      | 2         | 70      | 80      | 26      | 40      | 40      | 47      | 39        | 39      | 16      |
| 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 |
| Net Residential Density         | 15.6    | N/A     | 16.0      | 16.0    | 12.5    | 17.1    | 17.0    | 13.5    | N/A     | 15.3      | 15.8    |         |

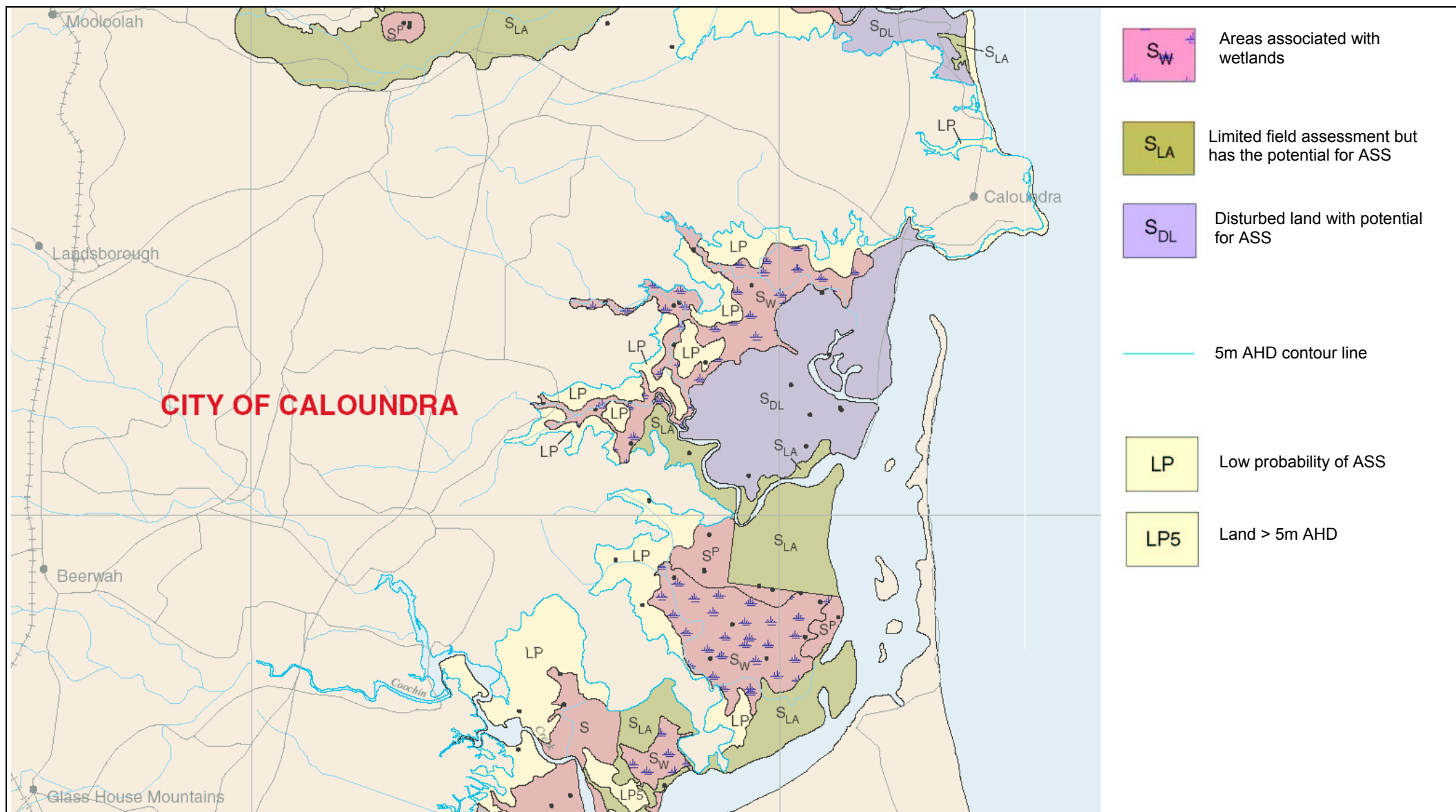
BH80



|          |                                                 |       |          |      |       |    |          |    |      |            |       |     |               |    |         |                                   |  |
|----------|-------------------------------------------------|-------|----------|------|-------|----|----------|----|------|------------|-------|-----|---------------|----|---------|-----------------------------------|--|
| revision | description                                     | drawn | approved | date | drawn | RY | approved | AC | date | 29-11-2010 | scale | NTS | original size | A3 | client: | BROWN CONSULTING (QLD) PTY LTD    |  |
|          | DCP testing to 1.5m in all BH locations         |       |          |      |       |    |          |    |      |            |       |     |               |    |         | BELLVISTA 2                       |  |
|          | 4 CBR subgrade samples                          |       |          |      |       |    |          |    |      |            |       |     |               |    |         | PRECINCT 1 & 2 BOREHOLE LOCATIONS |  |
|          | 2 Emerson in topsoil and 6 Emerson in subsoil   |       |          |      |       |    |          |    |      |            |       |     |               |    |         | project no: GEOTKPAR01560AA       |  |
|          | 4 soil samples (1kg) at varying depths up to 2m |       |          |      |       |    |          |    |      |            |       |     |               |    |         | figure no: FIGURE 1               |  |

- ◆ BH drilled to 6m ASS to 3m
- ▲ BH drilled to 4m ASS to 4m
- BH drilled to 3m ASS to 3m
- ASS samples taken at 0.25m

coffey  
geotechnics  
SPECIALISTS MANAGING  
THE EARTH



|               |                 |
|---------------|-----------------|
| drawn         | <b>RY</b>       |
| approved      | <b>RM</b>       |
| date          | <b>30/06/09</b> |
| scale         | <b>NTS</b>      |
| original size | <b>A4</b>       |

**coffey**  
geotechnics  
SPECIALISTS MANAGING  
THE EARTH

|             |                                                                                            |                            |
|-------------|--------------------------------------------------------------------------------------------|----------------------------|
| client:     | <b>BROWN CONSULTING (QLD) PTY LTD</b>                                                      |                            |
| project:    | <b>BELLVISTA STAGE 2<br/>BELLVISTA BOULEVARD, CALOUNDRA<br/>GEOTECHNICAL INVESTIGATION</b> |                            |
| title:      | <b>ACID SULFATE SOILS HAZARD MAP</b>                                                       |                            |
| project no: | <b>GEOTKPAR01560AA</b>                                                                     | figure no: <b>FIGURE 2</b> |

# Appendix A

## **Borehole Logs and Explanation Sheets**

Borehole No. **BH1**

# Engineering Log - Borehole

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

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

Date started: **15.6.2009**

Principal:

Date completed: **15.6.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

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                             |                    |                 |                                                                                      | SM                                                                                                                    | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                      | M                     | L                             |                                    | DIST PP=110kPa<br><br>DIST PP=190kPa<br><br>DIST PP=250kPa<br><br>DIST PP=290kPa<br><br>DIST PP=280kPa<br><br>DIST PP=250kPa |  |
|                      |             |   |   |         |       |                                 |                    | SP              | <b>SAND:</b> fine to medium grained, pale brown, trace of silt and clay fines.       | W                                                                                                                     |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    | SC              | <b>CLAYEY SAND:</b> fine to medium grained, pale brown/orange, low plasticity fines. |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 1                  |                 | CL                                                                                   | <b>SANDY CLAY:</b> low plasticity, pale brown/orange and red, fine to medium sand, trace of gravel.                   | M                                                                                                             | St                    |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 2                  |                 | CH                                                                                   | <b>SANDY CLAY:</b> medium plasticity/high plasticity, orange/red and pale grey, fine to medium sand, trace of gravel. |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 | CH                                                                                   | <b>SANDY CLAY:</b> high plasticity, red and pale grey, fine to medium sand.                                           |                                                                                                               | VSt                   |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 3                  |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 4                  |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 5                  |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 | 6                  |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      | Borehole BH1 terminated at 6m                                                                                         |                                                                                                               |                       |                               |                                    | LIMIT OF INVESTIGATION                                                                                                       |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      |             |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |
|                      | </          |   |   |         |       |                                 |                    |                 |                                                                                      |                                                                                                                       |                                                                                                               |                       |                               |                                    |                                                                                                                              |  |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH2**

# 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: 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 |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               | 100                                | 200 | 300            |                                          |
| ADT                  |             |   |   | N       | ASS   | 40                              |    |                                                                                                               | SM          | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics. | M                                                                                                             | L                     |                               |                                    |     |                | DIST PP=140kPa                           |
|                      |             |   |   |         |       |                                 | SM | <b>SILTY SAND:</b> fine to medium grained, dark grey.                                                         |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 | SP | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     | M/W         |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       | 1                               | SP | <b>SAND:</b> fine to coarse grained, pale grey.                                                               | W           | L/MD                                                                     |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       | 2                               | CL | <b>SANDY CLAY:</b> medium plasticity, orange/red and pale grey, fine to coarse grained sand, trace of gravel. | M           | St                                                                       |                                                                                                               | X                     |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       | 3                               | CH | <b>SANDY CLAY:</b> high plasticity, red and pale grey, fine to medium grained sand.                           |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     | DIST PP=220kPa |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |
|                      |             |   |   |         |       |                                 |    |                                                                                                               |             |                                                                          |                                                                                                               |                       |                               |                                    |     |                |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                                                                                                       |
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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 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. **BH3**

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: 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 |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale brown, low plasticity fines.                                        | M                     | MD                            |                                    | FILL                                     |
|                      |             |   |   |         |       |                                 |    | 5               |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             |                       |                               |                                    | NATURAL                                  |
|                      |             |   |   |         |       |                                 |    | 1               |             | SP                       | SAND: fine to medium grained, grey/brown, trace of silt and clay.                                             |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 4               |             | CH                       | SANDY CLAY: high plasticity, pale brown/orange and pale grey, fine to medium grained sand.                    |                       | St                            | X                                  | DIST PP=180kPa                           |
|                      |             |   |   |         |       |                                 |    | 2               |             |                          | ...colour changing to pale grey.                                                                              |                       | VSt                           | X                                  | DIST PP=240kPa                           |
|                      |             |   |   |         |       |                                 |    | 3               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=200kPa                           |
|                      |             |   |   |         |       |                                 |    | 3               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=250kPa                           |
|                      |             |   |   |         |       |                                 |    | 2               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=340kPa                           |
|                      |             |   |   |         |       |                                 |    | 4               |             | CH                       | SANDY CLAY: high plasticity, pale grey, fine to coarse grained sand.                                          |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 1               |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=350kPa                           |
|                      |             |   |   |         |       |                                 |    | 5               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 0               |             | SC                       | CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.                                      |                       | D                             |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 6               |             |                          | Borehole BH3 terminated at 6m                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 |    | -1              |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 7               |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | -2              |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 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 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 |
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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                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                                                               | M                                                                                                                                                     | MD                            |                                                                                                                                                                   |                                          |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6  | 1                                                                                                                                                                                                                                                                                                                        |             | SP                       | SAND: fine to medium grained, grey.<br><br>...colour changing to dark brown.                                                                       | W                                                                                                                                                     |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5  | 2                                                                                                                                                                                                                                                                                                                        |             | SP                       | SAND: fine to medium grained, brown, with silt<br>and trace of gravel.                                                                             | M                                                                                                                                                     | VD                            |                                                                                                                                                                   | DIST PP=100kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |                                                                                                                                                                                                                                                                                                                          |             | CH                       | SANDY CLAY: 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                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3  | 4                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                    |                                                                                                                                                       | VSt/H                         | x                                                                                                                                                                 | DIST PP=400kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2  | 5                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                    |                                                                                                                                                       | VSt                           | x                                                                                                                                                                 | DIST PP=240kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1  | 6                                                                                                                                                                                                                                                                                                                        |             | CL                       | SANDY CLAY: medium plasticity, pale grey, fine<br>to coarse grained sand, trace of gravel.                                                         |                                                                                                                                                       |                               | x                                                                                                                                                                 | DIST PP=200kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |                                                                                                                                                                                                                                                                                                                          |             | CH                       | SANDY CLAY: high plasticity, pale grey, fine to<br>medium grained sand.                                                                            |                                                                                                                                                       | St                            | x                                                                                                                                                                 | DIST PP=200kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    | 6                                                                                                                                                                                                                                                                                                                        |             |                          | Borehole BH4 terminated at 6m                                                                                                                      |                                                                                                                                                       |                               | x                                                                                                                                                                 | DIST PP=200kPa                           |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0  | 7                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                    |                                                                                                                                                       |                               |                                                                                                                                                                   | LIMIT OF INVESTIGATION                   |
|                                                                                          |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -1 | 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><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>W <sub>p</sub> plastic limit<br>W <sub>L</sub> 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 |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Borehole No. **BH5**

# 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: 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                                                                                                                                                                   |    |                 |             | SM                                                                                                                                                                                    | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                                              | M                     | L                             |                                                                                                                                                                                                |                                          |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   |    |                 |             | SP                                                                                                                                                                                    | SAND: fine to medium grained, grey, trace of silt.                                                                             |                       |                               |                                                                                                                                                                                                |                                          |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -2 | 1               |             | SP                                                                                                                                                                                    | SAND: fine to medium grained, pale grey.<br>...colour changing to pale grey and brown.<br>...colour changing to dark brown.    | M/W                   | D/VD                          |                                                                                                                                                                                                |                                          |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       | ASS                                                                                                                                                                                                                                                                                                                                               | -1 | 2               |             | SC                                                                                                                                                                                    | CLAYEY SAND: fine to medium grained, dark brown, low plasticity fines.<br>...colour changing to pale grey.                     | W                     | MD                            |                                                                                                                                                                                                |                                          |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -0 | 3               |             | CH                                                                                                                                                                                    | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.<br><br>...colour changing to pale grey and red. | M                     | VSt                           | X                                                                                                                                                                                              | DIST PP=220KPa                           |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -1 | 4               |             |                                                                                                                                                                                       |                                                                                                                                |                       |                               | X                                                                                                                                                                                              | DIST PP=240kPa                           |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -2 | 5               |             | CH                                                                                                                                                                                    | SANDY CLAY: high plasticity, pale grey/orange and red, fine to medium grained sand, trace of gravel.                           |                       |                               | X                                                                                                                                                                                              | DIST PP=280kPa                           |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -3 | 6               |             |                                                                                                                                                                                       |                                                                                                                                |                       |                               | X                                                                                                                                                                                              | DIST PP=250kPa                           |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -4 | 7               |             |                                                                                                                                                                                       | Borehole BH5 terminated at 6m                                                                                                  |                       |                               |                                                                                                                                                                                                | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                                                                                                                                                                                                                                                                                   | -5 | 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>no resistance ranging to refusal<br>water<br> 10/1/98 water level on date shown<br> water inflow<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 soil description<br>based on unified classification 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. **BH6**

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

## Engineering Log - Borehole

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

Date started: **1.5.2009**

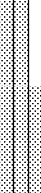
Principal:

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: 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<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   | 4                               |    |                 | SM          | SILTY SAND: fine to medium grained, dark grey, trace of organics and clay.<br>CLAYEY SAND: fine to medium grained, dark grey, medium plasticity fines. | M                                                                                                             | L                     |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    | SC              |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               | 1                     | SP                            | SAND: fine to medium grained, grey, with clay fines.                                                          | W                                        |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               | 3                     | SP                            | SAND: fine to medium grained, pale grey.                                                                      |                                          | MD |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          | D  |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               | 2                     | SC                            | CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.                                      | M                                        | VD |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       | SC                            | CLAYEY SAND: fine to coarse grained, brown and grey, low plasticity fines.                                    |                                          | D  |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       | SC                            | CLAYEY SAND: fine to medium grained, pale brown and grey, low plasticity fines.                               |                                          | MD |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               | 3                     | CH                            | SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand. ...high plasticity. | St                                       |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    | VSt |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       | 0                               |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |
|                           |                                                                                   |                                                                                    |   |                                                                                     |       |                                 |    |                 |             |                                                                                                                                                        |                                                                                                               |                       |                               |                                                                                                               |                                          |    |     |  |  |  |  |

Borehole No. **BH7**

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

# Engineering Log - Borehole

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>kPa                                                                                                                                                                             | penetro-<br>meter | structure and<br>additional observations |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | <b>SILTY SAND*</b> fine to medium grained, dark grey, trace of organics.                                      | M                                                                                                                                                                                       | L                             |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 4                                                                                                                                                                                                                                                                                                                                                        |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 1                                                                                                                                                                                                                                                                                                                                                        |             |                          | ...with gravel.                                                                                               | W                                                                                                                                                                                       | MD                            |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 3                                                                                                                                                                                                                                                                                                                                                        |             | SC                       | <b>SILTY CLAYEY SAND:</b> fine to medium grained, pale brown and grey, low plasticity fines.                  | M                                                                                                                                                                                       | MD/D                          |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 2                                                                                                                                                                                                                                                                                                                                                        |             | SP                       | <b>SAND:</b> fine to medium grained, dark brown, trace of silt.                                               |                                                                                                                                                                                         | VD                            |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 2                                                                                                                                                                                                                                                                                                                                                        |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey/brown, fine to medium grained sand.                   |                                                                                                                                                                                         | VSt                           |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 3                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 1                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   | DIST PP=250kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 4                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 0                                                                                                                                                                                                                                                                                                                                                        |             |                          | ...fine to coarse grained sand, trace of gravel.                                                              |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 5                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 6                                                                                                                                                                                                                                                                                                                                                        |             | SC                       | <b>CLAYEY SAND:</b> fine to coarse grained, pale grey/brown, low plasticity fines.                            | W                                                                                                                                                                                       | D                             |                                                                                                                                                                                                       |                   | DIST PP=280kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | -1                                                                                                                                                                                                                                                                                                                                                       |             |                          |                                                                                                               |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 6                                                                                                                                                                                                                                                                                                                                                        |             |                          | Borehole BH7 terminated at 6m                                                                                 |                                                                                                                                                                                         |                               |                                                                                                                                                                                                       |                   | LIMIT OF INVESTIGATION                   |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | -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><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. **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>meter<br>kPa | structure and<br>additional observations |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |                 |             |                          |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       | D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    | 1               |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace or organics.                                                                                    | M                                                                                                                                                                                                                                                                                                                                                        | MD                            |                                    |                                          |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 2               |             | SP                       | <b>SAND:</b> fine to medium grained, grey.<br><br>...trace of clay.                                                                                         | M/W                                                                                                                                                                                                                                                                                                                                                      | D                             |                                    |                                          |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 3               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                                                                       | M                                                                                                                                                                                                                                                                                                                                                        | St                            | X                                  | DIST PP=200kPa                           |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    | 4               |             | 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                            |                                    |                                          |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 5               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.                                                            | M                                                                                                                                                                                                                                                                                                                                                        | St                            | X                                  | DIST PP=150kPa                           |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 6               |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale grey, fine to coarse grained sand.                                                                               |                                                                                                                                                                                                                                                                                                                                                          |                               | X                                  | DIST PP=160kPa                           |  |  |                                                                                                                                                                                         |  |  |  |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | 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><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 |  |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                         |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 |
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Borehole No. **BH9**

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: 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 |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | 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                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |    | 2               |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey.                                                               | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             | 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                            |                                    |                                          |
|                      |             |   |   |         | ASS   |                                 | 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                                                                                 |                       |                               |                                    | DIST PP=200kPa<br>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><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:

[illegible]

# 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.                                                                                                                                                          | D/M                   | VD                            |                                                                                      |                                          |               |                |       |  |  |  |  |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SP                       | SAND: fine to medium grained, brown, trace of fine grained gravel.                                                                                                                                | M                     | D                             |                                                                                      |                                          |               |                |       |  |  |  |  |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SP                       | SAND: fine to medium grained, pale brown/orange.<br>...colour changing to pale brown.                                                                                                             | W                     | MD                            |                                                                                      |                                          |               |                |       |  |  |  |  |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | SC                       | CLAYEY SAND: fine to medium grained, pale brown/orange and pale grey, medium plasticity fines.                                                                                                    | M                     | VSt                           |                                                                                      |                                          |               |                |       |  |  |  |  |  |
|                           |             |   |   |         |                                                                                   |                                 |    |                    |                                                                                   | 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. |                       |                               |                                                                                      |                                          | 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              |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| 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<br>meter | structure and<br>additional observations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 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><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br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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<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><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

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: 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                                                                                      |                                                                                |                |                    |  |  |  |  |                      |  | moisture<br>condition | consistency/<br>density index | pocket<br>penetro-<br>meter |     |    |  | structure and<br>additional observations |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          | soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               | kPa                         |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ADT                       |  | 1           | 2 | 3 | N       |       |                                 |    |                 |             |                          | SM                                                                                            | SILTY SAND: fine to medium grained, dark grey, trace of organics.              |                |                    |  |  |  |  |                      |  |                       | M                             | L                           |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          | SP                                                                                            | SAND: fine to medium grained, grey.                                            |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             | D | 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                             |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          | CH                                                                                            | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand. |                |                    |  |  |  |  |                      |  |                       |                               | M                           | St  | X  |  | DIST PP=160kPa                           |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       | VSt                           |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          | X                                                                                             |                                                                                | DIST PP=250kPa |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                               |                                                                                |                |                    |  |  |  |  |                      |  |                       |                               |                             |     |    |  |                                          |  |             |   |      |  |  |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Borehole No. **BH15**

# 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: 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<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, trace of organics.                                      | M                     | L                             |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     |                       | L/MD                          |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, dark brown, trace of silt.                                               |                       | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey and pale brown/orange, fine to medium grained sand.             |                       | VSt                           |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=210kPa                           |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=300kPa                           |
|                      |             |   |   |         |       |                                 | 0  |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to coarse grained sand.                         |                       | St                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=150kPa                           |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=200kPa                           |
|                      |             |   |   |         |       |                                 | 5  |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey/orange and red, fine to coarse grained sand.                    |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -3 |                 |             |                          |                                                                                                               |                       |                               | x                                  | DIST PP=160kPa                           |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -4 |                 |             |                          | Borehole BH15 terminated at 6m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 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<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. **BH16**

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: 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 | 100<br>200<br>300<br>400 | structure and<br>additional observations                                                                                                                                                                                                                                                                                                                 |                        |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |                       |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                          |                                                                                                               |                       |                               |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          |                        |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
| ADT                                                                                                                                                                                                                    |             |   |   | N                     |       |                                 | 3  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                      | M/W                   | L                             |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          |                        |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     | M/W                   |                               |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          | SEEPAGE                |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, orange and pale grey, fine to medium grained sand.                      | M                     | St                            |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          |                        |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       | D     |                                 | 2  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | CH                       | <b>SANDY CLAY:</b> high plasticity, orange and pale grey, fine to medium grained sand.                        |                       |                               |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          |                        |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             | CH                       | <b>SANDY SILTY CLAY:</b> high plasticity, pale grey, fine grained sand.                                       |                       | St/VSt                        |                                    | X                        |                                                                                                                                                                                                                                                                                                                                                          | DIST PP=200kPa         |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       | ASS                             | 1  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                          | ...colour changing to pale grey and red.                                                                      |                       |                               |                                    | X                        |                                                                                                                                                                                                                                                                                                                                                          | DIST PP=250kPa         |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 | 0  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                          | ...colour changing to pale grey.                                                                              |                       |                               |                                    | X                        |                                                                                                                                                                                                                                                                                                                                                          | DIST PP=240kPa         |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 | 4  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |                          | Borehole BH16 terminated at 4m                                                                                |                       |                               |                                    |                          |                                                                                                                                                                                                                                                                                                                                                          | LIMIT OF INVESTIGATION |  |  |  |  |  |  |                                                                                                                                                                                                 |  |  |  |  |  |  |  |                                                                                                                                                                                                       |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                       |       |                                 | 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> 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. **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 | 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  | 4                                                                                                                                                                                                    |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 2  |                                                                                                                                                                                                      |             |                          | Borehole BH17 terminated at 4m                                                                                         |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    | LIMIT OF INVESTIGATION                   |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 |    | 5                                                                                                                                                                                                    |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 1  |                                                                                                                                                                                                      |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 6  |                                                                                                                                                                                                      |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 0  |                                                                                                                                                                                                      |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 7  |                                                                                                                                                                                                      |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | -1 |                                                                                                                                                                                                      |             |                          |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                          |                               |                                    |                                          |                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                                       |  |  |  |
|                                                                                                                                                                                                                        |             |   |   |                     |       |                                 | 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. **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 |
| ADT                  | 1           | 2 | 3 | N       |       |                                 |    |                 |             |                                                                                          |                                                                                                               |                       |                               | 100<br>200<br>300<br>400           |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             | SM                                                                                       | <b>SILTY SAND:</b> fine to medium grained, dark brown, trace of organics.                                     | M                     | MD                            |                                    | DIST PP=160kPa                           |
|                      |             |   |   |         |       |                                 |    |                 | SP          | <b>SAND:</b> fine to medium grained, grey/brown.                                         |                                                                                                               | L                     |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 | SP          | <b>SAND:</b> fine to medium grained, pale brown, trace of clay fines.                    | W                                                                                                             |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 | SC          | <b>CLAYEY SAND:</b> fine to medium grained, pale brown and orange, low plasticity fines. |                                                                                                               | L/MD                  |                               |                                    |                                          |
|                      |             |   |   |         |       | ASS                             | 5  |                 |             | CH                                                                                       | <b>SANDY CLAY:</b> medium to high plasticity, orange/red and pale grey, fine to medium grained sand.          | M                     | St                            | X                                  |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             | SC                                                                                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey and pale brown/orange, low plasticity fines.            | M/W                   | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             | CH                                                                                       | <b>SANDY CLAY:</b> high plasticity, pale grey, fine to medium grained sand.<br>...medium to high plasticity.  | M                     | VSt                           | X                                  | DIST PP=220kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                                                                                          |                                                                                                               |                       | St                            | X                                  | DIST PP=140kPa                           |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                                                                                          | Borehole BH18 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                                                                                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 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>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. **BH19**

# 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: 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 |            |            |              | structure and<br>additional observations |  |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                                                                                                                                                                    |                       |                               | 100<br>kPa                  | 200<br>kPa | 300<br>kPa | 400<br>meter |                                          |  |
| ADT                  |             |   |   | N       |       |                                 |    | 3               |             | SM<br>SP                 | <b>SILTY SAND:</b> fine to medium grained, dark grey,<br>trace of organics.<br><b>SAND:</b> fine to medium grained, grey.<br><br>...colour changing to pale grey.<br><br>...colour changing to dark grey.<br><br>...colour changing to dark brown. | M<br><br><br><br>W    | L<br>MD<br>D<br>VD<br><br>D   |                             |            |            |              |                                          |  |
|                      |             |   |   |         | ASS   |                                 | 2  | 2               |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale<br>grey, fine to medium grained sand.                                                                                                                                                           | M                     | St                            | ×                           |            |            |              | PP=100kPa                                |  |
|                      |             |   |   |         |       |                                 |    | 3               |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             | ×          |            |              | PP=150kPa                                |  |
|                      |             |   |   |         |       |                                 |    | 0               |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             | ×          |            |              | PP=200kPa                                |  |
|                      |             |   |   |         |       |                                 |    | 4               |             |                          | Borehole BH19 terminated at 4m                                                                                                                                                                                                                     |                       |                               |                             |            |            |              | LIMIT OF INVESTIGATION                   |  |
|                      |             |   |   |         |       |                                 |    | -1              |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | 5               |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | -2              |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | 6               |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | -3              |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | 7               |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | -4              |             |                          |                                                                                                                                                                                                                                                    |                       |                               |                             |            |            |              |                                          |  |
|                      |             |   |   |         |       |                                 |    | 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 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. **BH20**

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: 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 | structure and<br>additional observations |
|                      | 1           | 2 | 3 |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, with clay fines and trace of organics.                  | M                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 4  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt and clay.                                            | W                     |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey and brown, low plasticity fines, trace of gravel.       |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey and orange, fine to medium grained sand.                        | M                     | VSt                           | x                                  | DIST PP=300kPa                           |
|                      |             |   |   |         |       |                                 | 2  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey and pale brown, low plasticity fines.                   | W                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 |             | CL                       | <b>SANDY CLAY:</b> medium plasticity, pale brown/orange and red, fine to medium grained sand.                 | M                     | St                            | x                                  | DIST PP=150kPa                           |
|                      |             |   |   |         |       |                                 | 4  |                 |             | CH                       | <b>SANDY CLAY:</b> high plasticity, pale grey and red, fine grained sand.                                     |                       |                               | x                                  | DIST PP=190kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH20 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 0  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 5  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 6  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 7  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -3 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | 8  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

| method                                                                                   | support                                                                                                                                         | penetration | water | notes, samples, tests                                                                                                                                                                                                                                                                                                    | classification symbols and soil description                                                                                                        | consistency/density index                                                                                                                                         |
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| 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>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 | N nil       |       | 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>W <sub>p</sub> plastic limit<br>W <sub>L</sub> 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 |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
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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 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><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. **BH21**

# 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: **17.4.2009**Date completed: **17.4.2009**

Logged by: **DF**

Checked by:

[illegible]

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                  |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
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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 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 |
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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 |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                                                                                                                         |                                                                                                                                                                                                     |                               |                                                                                                                                                                                                       |                                          |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3  |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                                                                                                                | M                                                                                                                                                                                                   | MD                            |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    | 1                                                                                                                                                                                                                                                                                                                                                        |             | SP                       | <b>SAND:</b> fine to medium grained, grey.<br><br>...fine to coarse grained, colour changing to dark brown and brown, trace of gravel.<br><br>...fine to medium grained, colour changing to dark brown. |                                                                                                                                                                                                     | D                             |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2  |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey and orange, fine to medium grained sand.<br><br>...colour changing to pale grey.                                                                | W                                                                                                                                                                                                   |                               |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                                                                                                                         | M                                                                                                                                                                                                   | St                            | X                                                                                                                                                                                                     | DIST PP=160kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1  | 2                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                                                                         |                                                                                                                                                                                                     |                               | X                                                                                                                                                                                                     | DIST PP=120kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0  | 3                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                                                                         |                                                                                                                                                                                                     | VSt                           | X                                                                                                                                                                                                     | DIST PP=320kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4  | 4                                                                                                                                                                                                                                                                                                                                                        |             |                          |                                                                                                                                                                                                         |                                                                                                                                                                                                     |                               | X                                                                                                                                                                                                     | DIST PP=240kPa                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -1 |                                                                                                                                                                                                                                                                                                                                                          |             |                          | Borehole BH23 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 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 |                                          |

# 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                       |    | Eastings: 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 |
| ADT                       | 1           | 2 | 3 | N       |       |                                 |    |                       |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                    | M                     | MD                            |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             | SP                       | SAND: fine to medium grained, pale grey.                                                             | M/W                   |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          | ...colour changing to dark grey.                                                                     |                       | VD                            |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          | colour changing to brown, trace of silt and clay fines.                                              | W                     | MD                            |                                    |                                          |
|                           |             |   |   |         |       | D<br>ASS                        |    |                       |             | CH                       | SANDY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand. | M                     | St                            | X                                  | DIST PP=160kPa                           |
|                           |             |   |   |         |       |                                 |    |                       |             |                          | ...colour changing to pale grey, fine to coarse grained sand.                                        |                       |                               | X                                  | DIST PP=200kPa                           |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             | SC                       | CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.                             |                       | MD                            |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          | Borehole BH24 terminated at 4m                                                                       |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |
|                           |             |   |   |         |       |                                 |    |                       |             |                          |                                                                                                      |                       |                               |                                    |                                          |

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       |       |                                 |    |                 |             |                          |                                                                                                               | M                     | D                             |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey/grey.                                                           |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SP                       | SAND: fine to medium grained, grey.<br><br>...colour changing to dark brown, trace of silt.                   |                       | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               | W                     |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | CH                       | SANDY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.          | M                     | St                            | X                                  | DIST PP=100kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=120kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=130kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       | VSt                           | X                                  | DIST PP=240kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               | X                                  | DIST PP=280kPa                           |
|                      |             |   |   |         |       |                                 |    |                 |             | SC                       | CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.                                      | W                     | MD/D                          |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             | SP                       | SAND: fine to medium grained, pale grey, trace of clay fines.                                                 |                       | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          | Borehole BH25 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 |    |                 |             |                          |                                                                                                               |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                     |                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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<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, with organics present.                                  | M                                                                                                                                                                                                   | L                             |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                     |             |   |   |         |       |                                                                                                                                                                                                          |    |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | <b>SAND:</b> fine to medium grained, dark grey, trace of silt.                                                | W                                                                                                                                                                                                   |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                     |             |   |   |         |       |                                                                                                                                                                                                          | -3 | 1                                                                                                                                                                                                                                                                                                                                                        |             | SP                       | <b>SAND:</b> fine to medium grained, grey/brown, trace of silt.                                               | M                                                                                                                                                                                                   | D/VD                          |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                     |             |   |   |         |       |                                                                                                                                                                                                          |    |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | <b>SAND:</b> fine to medium grained, pale grey, trace of clay.                                                | W                                                                                                                                                                                                   | MD                            |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                     |             |   |   |         |       |                                                                                                                                                                                                          | -2 | 2                                                                                                                                                                                                                                                                                                                                                        |             | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, pale grey and pale brown/orange, medium plasticity fines.         | M                                                                                                                                                                                                   |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                     |             |   |   |         |       | ASS                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                         |                                                                                                                                                                                                     | St                            | X                                  | DIST PP=160kPa                                                                                                                                                                                        |  |
|                                                                                                                                                                                                                     |             |   |   |         |       |                                                                                                                                                                                                          |    |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | <b>SANDY CLAY:</b> 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 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. **BH28**

# 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: 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>meter<br>kPa | structure and<br>additional observations |
| 1                             | 2 | 3               |  |                                                                                                                       |       |                                                  |    |                      |             |                          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| ADT                           |   |                 |  | N                                                                                                                     |       |                                                  | -3 |                      |             | SM<br>SP                 | SILTY SAND: fine to medium grained, dark grey, trace or organics.<br>SAND: fine to medium grained, brown.<br><br>...colour changing to orange/brown, wirth silt and trace of gravel.<br><br>...colour changing to dark grey/brown, trace of silt. | M<br>M/W<br>M<br>W                          | MD<br>D                       |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -1 |                      |             | SC                       | CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.                                                                                                                                                                          |                                             | MD                            |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -0 |                      |             | CL                       | SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand.                                                                                                                                                                            | M                                           | St                            | X                                  | DIST PP=150kPa                           |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -4 |                      |             |                          | Borehole BH28 terminated at 6m                                                                                                                                                                                                                    |                                             |                               |                                    | LIMIT OF INVESTIGATION                   |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -1 |                      |             |                          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -2 |                      |             |                          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -3 |                      |             |                          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       |                                                  | -4 |                      |             |                          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| method                        |   | auger screwing* |  | support                                                                                                               | N nil |                                                  |    |                      |             |                          | notes, samples, tests                                                                                                                                                                                                                             | classification symbols and soil description |                               | consistency/density index          |                                          |
| AS                            |   | auger drilling* |  |                                                                                                                       |       |                                                  |    |                      |             |                          |                                                                                                                                                                                                                                                   | based on unified classification system      |                               | moisture                           |                                          |
| AD                            |   |                 |  | M mud                                                                                                                 |       | U <sub>50</sub> undisturbed sample 50mm diameter |    | D dry                |             | S soft                   |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| RR                            |   | roller/tricone  |  | C casing                                                                                                              |       | U <sub>63</sub> undisturbed sample 63mm diameter |    | M moist              |             | F firm                   |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| W                             |   | washbore        |  | penetration                                                                                                           |       | D disturbed sample                               |    | W wet                |             | St stiff                 |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| CT                            |   | cable tool      |  | 1 2 3 4                                                                                                               |       | N standard penetration test (SPT)                |    | Wp plastic limit     |             | VSt very stiff           |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| HA                            |   | hand auger      |  |                                    |       | N* SPT - sample recovered                        |    | WL liquid limit      |             | H hard                   |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| DT                            |   | diatube         |  | water                                                                                                                 |       | Nc SPT with solid cone                           |    |                      |             | Fb friable               |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| B                             |   | blank bit       |  |  10/1/98 water level on date shown |       | V vane shear (kPa)                               |    |                      |             | VL very loose            |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| V                             |   | V bit           |  |  water inflow                      |       | P pressuremeter                                  |    |                      |             | L loose                  |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| T                             |   | TC bit          |  |  water outflow                     |       | Bs bulk sample                                   |    |                      |             | MD medium dense          |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
| *bit shown by suffix e.g. ADT |   |                 |  |                                                                                                                       |       | E environmental sample                           |    |                      |             | D dense                  |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |
|                               |   |                 |  |                                                                                                                       |       | R refusal                                        |    |                      |             | VD very dense            |                                                                                                                                                                                                                                                   |                                             |                               |                                    |                                          |

Borehole No. **BH29**

# 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: **20.4.2009**Date completed: **20.4.2009**

Logged by: **DF**

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 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                            |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -3 |                                                                                                                                                                                                                                                                                                                                                   |             | SM<br>SP                 | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.<br>SAND: fine to medium grained, grey/brown. | M/W                                                                                                                                                                                         |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 |    | 1                                                                                                                                                                                                                                                                                                                                                 |             |                          |                                                                                                                   |                                                                                                                                                                                             | VD                            |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                   |             | SP                       | SAND: fine to medium grained, pale brown and<br>pale grey, with clay fines and trace of silt and gravel.          | M                                                                                                                                                                                           | D                             |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -2 |                                                                                                                                                                                                                                                                                                                                                   |             | SC                       | CLAYEY SAND: fine to medium grained, pale<br>brown and grey, low plasticity fines.                                | W                                                                                                                                                                                           | MD                            |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       | ASS                             | 2  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -1 |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 3  |                                                                                                                                                                                                                                                                                                                                                   |             | CL                       | SANDY CLAY: medium plasticity, pale brown and<br>pale grey, fine to coarse grained sand.                          | M                                                                                                                                                                                           | St                            | x                                                              | DIST PP=100kPa                           |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 0  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 4  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               | x                                                              | DIST PP=140kPa                           |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 |    |                                                                                                                                                                                                                                                                                                                                                   |             |                          | Borehole BH29 terminated at 4m                                                                                    |                                                                                                                                                                                             |                               |                                                                | LIMIT OF INVESTIGATION                   |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -1 |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 5  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -2 |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 6  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -3 |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 7  |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | -4 |                                                                                                                                                                                                                                                                                                                                                   |             |                          |                                                                                                                   |                                                                                                                                                                                             |                               |                                                                |                                          |                                                                                                                                                                                                |  |  |  |
|                                                                                                                                                                                                                 |             |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                 | 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> 10/1/98 water level<br>on date shown<br> water inflow<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. **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                           |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | 1                  |                 |             |                                                                                                                                                 |                                                                                                               | VSt                   |                               | X                                  |                                                                                      |
|                      |             |   |   |         |       |                                 | 2                  |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               | X                                  |                                                                                      |
|                      |             |   |   |         |       |                                 | 3                  |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               | X                                  |                                                                                      |
|                      |             |   |   |         |       |                                 | 0                  |                 |             |                                                                                                                                                 |                                                                                                               | St                    |                               | X                                  |                                                                                      |
|                      |             |   |   |         |       |                                 | 4                  |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -1                 |                 |             |                                                                                                                                                 | Borehole BH30 terminated at 4m                                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                                                               |
|                      |             |   |   |         |       |                                 |                    | 5               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -2                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 6               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -3                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 7               |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 | -4                 |                 |             |                                                                                                                                                 |                                                                                                               |                       |                               |                                    |                                                                                      |
|                      |             |   |   |         |       |                                 |                    | 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. **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, trace of organics.                                      | M                     | L                             |                                    |                                          | DIST PP=200kPa         |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 2                               |    |    | SP                                                                                | <b>SAND:</b> fine to medium grained, grey.                                                 | M/W                                                                                                           |                       |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 1                               |    |    | SP                                                                                | <b>SAND:</b> fine to medium grained, brown, trace of clay.                                 | W                                                                                                             | MD                    |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         | D                                                                                 | 1                               |    |   | CH                                                                                | <b>SANDY CLAY:</b> medium to high plasticity, grey and brown, fine to medium grained sand. | M                                                                                                             | VSt                   |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         | ASS                                                                               | 2                               |    |  | CH                                                                                | <b>SANDY CLAY:</b> high plasticity, pale grey and red, fine grained sand.                  |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 0                               |    |                                                                                     |                                                                                   |                                                                                            | ...fine to medium grained sand.                                                                               |                       |                               |                                    |                                          | DIST PP=280kPa         |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 3                               |    |                                                                                     |                                                                                   |                                                                                            |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | -1                              |    |                                                                                     |                                                                                   |                                                                                            |                                                                                                               |                       |                               |                                    |                                          | DIST PP=300kPa         |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 4                               |    |                                                                                     |                                                                                   |                                                                                            | Borehole BH31 terminated at 4m                                                                                |                       |                               |                                    |                                          | LIMIT OF INVESTIGATION |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | -2                              |    |                                                                                     |                                                                                   |                                                                                            |                                                                                                               |                       |                               |                                    |                                          |                        |
|                      |                                                                                    |                                                                                    |                                                                                    |         |                                                                                   | 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><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. **BH32**

# 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: 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>kPa | meter | structure and<br>additional observations                             |
| ADT                  | 1 2 3       | N       |       |                                 |                    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                          | M                     | L                             |                           |       | DIST PP=110kPa<br><br><br><br><br><br><br><br><br><br>DIST PP=120kPa |
|                      |             |         |       |                                 | 2                  | 1               |             | SP                       | SAND: fine to medium grained, grey, trace of silt.<br><br>...colour changing to dark brown.                   | W                     |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 1                  |                 |             | SC                       | CLAYEY SAND: fine to medium grained, grey,<br>low plasticity fines.                                           |                       | MD                            |                           |       |                                                                      |
|                      |             |         |       |                                 | 1                  |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale<br>grey and pale brown/orange, medium plasticity fines.             | M                     |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 2                  |                 |             | CH                       | SANDY CLAY: medium to high plasticity, pale<br>grey, fine to medium grained sand.                             |                       | St                            | X                         |       |                                                                      |
|                      |             |         |       |                                 | 0                  |                 |             | SC                       | CLAYEY SAND: fine to medium grained, pale<br>grey, medium plasticity fines.                                   | M/W                   | MD                            |                           |       |                                                                      |
|                      |             |         |       |                                 | 3                  |                 |             | CH                       | SANDY CLAY: medium to high plasticity, pale<br>grey, fine to medium grained sand.                             | M                     | St                            | X                         |       |                                                                      |
|                      |             |         |       |                                 | -1                 |                 |             | SP                       | SAND: fine to medium grained, pale grey, with<br>clay fines.                                                  | W                     | MD                            |                           |       |                                                                      |
|                      |             |         |       |                                 | 4                  |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 |                    |                 |             |                          | Borehole BH32 terminated at 4m                                                                                |                       |                               |                           |       | LIMIT OF INVESTIGATION                                               |
|                      |             |         |       |                                 | -2                 |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 5                  |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | -3                 |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 6                  |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | -4                 |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 7                  |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | -5                 |                 |             |                          |                                                                                                               |                       |                               |                           |       |                                                                      |
|                      |             |         |       |                                 | 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 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><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. **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<br>penetro-<br>meter<br>kPa<br>100<br>200<br>300<br>400 | structure and<br>additional observations                                                                                                                                                                   |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        | 1           | 2 | 3 |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            |                       |                               |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
| ADT                                                                                                                                                                                                                    |             |   |   | N       |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |                       |                                                                                                                                                                                                                                                                                                                                                          | 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. | M                     | L                             |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -2 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            | W                     |                               |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -1 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            | MD                    |                               |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -2 |                       |                                                                                                                                                                                                                                                                                                                                                          | CH                       | SANDY CLAY: medium to high plasticity, pale<br>grey and orange, fine to medium grained sand.                               | M                     | St/VSt                        | X                                                              | DIST PP=200kPa                                                                                                                                                                                             |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -1 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            |                       |                               | X                                                              | DIST PP=220kPa                                                                                                                                                                                             |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -2 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            |                       |                               |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -3 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          | ...fine to coarse grained sand.                                                                                            |                       |                               |                                                                |                                                                                                                                                                                                            |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -4 |                       |                                                                                                                                                                                                                                                                                                                                                          | CL                       | SANDY CLAY: medium plasticity, pale grey, fine<br>to medium grained sand, trace of fine to medium<br>grained gravel.       |                       | VSt                           | X                                                              | DIST PP=260kPa                                                                                                                                                                                             |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -5 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          |                                                                                                                            |                       |                               | X                                                              | DIST PP=300kPa                                                                                                                                                                                             |  |  |                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -6 |                       |                                                                                                                                                                                                                                                                                                                                                          |                          | Borehole BH33 terminated at 4m                                                                                             |                       |                               |                                                                | 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> 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. **BH34**

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

# Engineering Log - Borehole

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: 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 | structure and<br>additional observations         |
| ADT                  | 1           | 2 | 3 | N       |       |                                 |                    |                 |             | 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                             | 100                                | DIST PP=150kPa<br><br><br><br><br>DIST PP=220kPa |
|                      |             |   |   |         |       | 2                               |                    |                 | SP          |                                                                                               |                                                                                                                                                                     |                       | MD                            | 200                                |                                                  |
|                      |             |   |   |         |       | 1                               |                    |                 | SP          | SAND: fine to medium grained, grey and brown,<br>with silt and a trace of clay.               | W                                                                                                                                                                   |                       | 300                           |                                    |                                                  |
|                      |             |   |   |         |       | 1                               |                    |                 | CH          | SANDY CLAY: high plasticity, pale brown/orange<br>and pale grey, fine to medium grained sand. | M                                                                                                                                                                   | St                    | 400                           |                                    |                                                  |
|                      |             |   |   |         |       | 2                               |                    |                 | CH          | SILTY CLAY: high plasticity, pale grey and<br>orange, with fine grained sand.                 |                                                                                                                                                                     | VSt                   | 400                           |                                    |                                                  |
|                      |             |   |   |         |       | 3                               |                    |                 | SC          | CLAYEY SAND: fine to medium grained, pale<br>grey, low plasticity fines.                      | W                                                                                                                                                                   | MD                    | 400                           |                                    |                                                  |
|                      |             |   |   |         |       | 4                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 4                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       |                                 |                    |                 |             |                                                                                               | Borehole BH34 terminated at 4m                                                                                                                                      |                       |                               |                                    | LIMIT OF INVESTIGATION                           |
|                      |             |   |   |         |       | 2                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 5                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 3                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 6                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 4                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 7                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 5                               |                    |                 |             |                                                                                               |                                                                                                                                                                     |                       |                               |                                    |                                                  |
|                      |             |   |   |         |       | 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>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. **BH35**

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: 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<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                     | 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              |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
| 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         |       |                                 |    |                 |             |                          | soil type: plasticity or particle characteristics,<br>colour, secondary and minor components. | M                     | L                             | 100<br>200<br>300<br>400           |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                          |                       | L/MD                          |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             | SP                       | SAND: fine to medium grained, grey.                                                           |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             | SP                       | SAND: fine to medium grained, brown, trace of<br>silt.                                        |                       | D/VD                          |                                    |                                          |
|                           |             |   |   |           |       |                                 |    | 2               |             | SC                       | CLAYEY SAND: fine to medium grained, pale<br>grey and brown, low plasticity fines.            | W                     | MD                            |                                    |                                          |
|                           |             |   |   |           |       | D<br>ASS                        |    |                 |             | CL                       | SANDY CLAY: medium plasticity, pale grey and<br>red, fine to coarse grained sand.             | M                     | VSt                           |                                    | (BORDERLINE CLAYEY SAND)                 |
|                           |             |   |   |           |       |                                 |    | 1               |             | CH                       | SANDY CLAY: high plasticity, pale grey and red,<br>fine to medium grained sand.               |                       |                               | X                                  | DIST PP=240kPa                           |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               | X                                  | DIST PP=250kPa                           |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               | X                                  | DIST PP=380kPa                           |
|                           |             |   |   |           |       |                                 |    | 3               |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          | Borehole BH36 terminated at 3m                                                                |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |
|                           |             |   |   |           |       |                                 |    |                 |             |                          |                                                                                               |                       |                               |                                    |                                          |

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 |
| ADT                  | 1 2 3       | N       |       |                                 | 4  |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey,<br>trace of organics.                                          | M                     | L                             |                                    |                                          |
|                      |             |         |       |                                 |    | 1               |             | SP                       | SAND: fine to medium grained, grey, trace of silt.                                                            |                       | L/MD                          |                                    |                                          |
|                      |             |         |       |                                 |    | 3               |             |                          | ...colour changing to dark grey.                                                                              |                       | VD                            |                                    | INDURATED SAND                           |
|                      |             |         |       |                                 |    | 2               |             | SP                       | SAND: fine to medium grained, dark brown, with<br>silt.                                                       | M/W                   | MD                            |                                    |                                          |
|                      |             |         |       |                                 |    | 2               |             | SP                       | SAND: fine to medium grained, pale grey and<br>grey.                                                          | W                     |                               |                                    |                                          |
|                      |             |         |       |                                 |    | 3               |             |                          | ...colour changing to dark brown.                                                                             |                       |                               |                                    |                                          |
|                      |             |         |       |                                 | 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>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. **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                       | SILTY SAND: fine to medium grained, grey, trace of organics.                                                  | M                     | MD                            |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             | SP                       | SAND: fine to medium grained, pale brown.                                                                     |                       |                               |                                    |                                          |
|                      |             |         |       |                                 |    |                 |             |                          | ...colour changing to brown.                                                                                  | D/M                   | D                             |                                    | CEMENTED                                 |
|                      |             |         |       |                                 |    |                 |             |                          | ...colour changing to dark brown.                                                                             |                       |                               |                                    |                                          |
|                      |             |         |       | ASS                             | 4  | 1               |             | CH                       | SANDY CLAY: 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<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. **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**

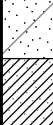
Project: **BELLVISTA 2**

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                           |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    | 1                                                                                                                                                                                                                                                                                                                                                        |   | SC                       | <b>CLAYEY SAND:</b> fine to medium grained, dark grey, medium plasticity fines.                                                        |                                                                                                                                                                                                 | MD                            |                                                                                                                                                                                                       |                                          |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    | 4                                                                                                                                                                                                                                                                                                                                                        |   | CL                       | <b>SANDY CLAY:</b> medium plasticity, dark grey, fine to medium grained sand.<br><br>...colour changing to pale brown/orange and grey. |                                                                                                                                                                                                 | St                            | x                                                                                                                                                                                                     |                                          |
|                                                                                                                                                                                                                        |             |   |   | ▶       |       | ASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    | 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>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. **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 ot 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 |            |                        |            | structure and<br>additional observations |
|                                | 1           | 2 | 3         |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               | 100<br>kPa                  | 200<br>kPa | 300<br>kPa             | 400<br>kPa |                                          |
| ADT                            |             | N |           | ASS     | 5     | 1                               |                    | SM              | SILTY SAND: fine to medium grained, grey, trace of organics.                                                                 | M                        | MD                                                                                                            |                       |                               |                             |            | DIST PP=300kPa         |            |                                          |
|                                |             |   |           |         |       |                                 |                    | SP              | SAND: fine to medium grained, brown.<br>...colour changing to pale grey.<br>...colour changing to dark brown, trace of silt. | W                        | D                                                                                                             |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    | SC              | CLAYEY SAND: fine to medium grained, grey/brown, low plasticity fines.                                                       |                          | VD                                                                                                            |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    | CH              | SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.                                                         | M                        | VSt                                                                                                           |                       |                               |                             |            |                        |            |                                          |
| Borehole BH41 terminated at 3m |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            | LIMIT OF INVESTIGATION |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |
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|                                |             |   |           |         |       |                                 |                    |                 |                                                                                                                              |                          |                                                                                                               |                       |                               |                             |            |                        |            |                                          |

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                                                                                                        | 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                       | GRAVELLY SANDY CLAY: low plasticity, pale brown and grey, fine to coarse sand and gravel.                       | M                     | St                            |                                    | FILL                                     |  |
|                      |             |         |       |                                 |                    |                 |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of clay fines.                                             |                       | D                             |                                    | NATURAL                                  |  |
|                      |             |         |       |                                 |                    | 1               |             | SP                       | SAND: fine to medium grained, dark brown/brown, trace of silt and clay fines. ...colour changing to pale brown. | M/W                   | MD                            |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 5               |             | CH                       | SANDY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.            | M                     | St                            |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 2               |             | SC                       | CLAYEY SAND: fine to medium grained, pale brown/orange and pale grey, low plasticity fines.                     | W                     | MD                            |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 4               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 3               |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.                       | M                     | St                            |                                    |                                          |  |
|                      |             |         |       |                                 |                    |                 |             |                          | Borehole BH42 terminated at 3m                                                                                  |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 3               |             |                          |                                                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |  |
|                      |             |         |       |                                 |                    | 4               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 2               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 5               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 1               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 6               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 0               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 7               |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | -1              |             |                          |                                                                                                                 |                       |                               |                                    |                                          |  |
|                      |             |         |       |                                 |                    | 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 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 |
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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               |             |                          |                                                                                                               |                       |                               |                                    |                                          |  |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                |                                                                                                                                                                                                       |
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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 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>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. **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 |
| ADT                  | 1           | 2 | 3 | N       |       |                                 | 4  |                 |             | SM                       | <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                            | 100                                |                                          |
|                      |             |   |   |         |       |                                 | 1  |                 | SP          | D                        |                                                                                                                                                                                                                                     | VD                    | 200                           |                                    |                                          |
|                      |             |   |   |         |       |                                 | 3  |                 |             | W                        |                                                                                                                                                                                                                                     |                       | 300                           |                                    |                                          |
|                      |             |   |   |         |       |                                 | 2  |                 |             | MD                       |                                                                                                                                                                                                                                     | 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  |                 |             |                          |                                                                                                                                                                                                                                     |                       |                               |                                    |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                         |                                                                                                                                                                                                       |
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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 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 |
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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 |
|                      | 1           | 2 | 3 |         |       |                                 |                    |                 |             |                          |                                                                                                                                |                       |                               |                                    |                                          |
| ADT                  |             |   |   | N       |       |                                 |                    |                 |             | SM                       | SILTY SAND: fine to medium grained, grey, trace of organics.                                                                   | M                     | MD                            |                                    |                                          |
|                      |             |   |   |         |       |                                 |                    | 1               |             | SP                       | SAND: fine to medium grained, grey/brown, trace of silt.                                                                       | W                     |                               |                                    |                                          |
|                      |             |   |   |         | ASS   |                                 | -3                 | 1               |             | CL                       | SANDY CLAY: medium plasticity, pale grey/orange and red, fine to medium grained sand.                                          | M                     | St                            | x                                  | DIST PP=100kPa                           |
|                      |             |   |   |         |       |                                 | -2                 | 2               |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey and red, fine to medium grained sand.<br><br>...colour changing to pale grey. |                       |                               | x                                  | DIST PP=100kPa                           |
|                      |             |   |   |         |       |                                 | -1                 | 3               |             |                          |                                                                                                                                |                       |                               | x                                  | DIST PP=140kPa                           |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          | Borehole BH46 terminated at 3m                                                                                                 |                       |                               |                                    | LIMIT OF INVESTIGATION                   |
|                      |             |   |   |         |       |                                 | 0                  | 4               |             |                          |                                                                                                                                |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -1                 | 5               |             |                          |                                                                                                                                |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -2                 | 6               |             |                          |                                                                                                                                |                       |                               |                                    |                                          |
|                      |             |   |   |         |       |                                 | -3                 | 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> 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 |
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Borehole No. **BH47**

# 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: 509628.376 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       |       |                                 |                    |                 |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                      | M                     | L                             | 100                                | DIST PP=300kPa<br><br>DIST PP=150kPa<br><br><br><br><br>LIMIT OF INVESTIGATION |
|                      |             |   |   |         |       |                                 | 4                  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey, trace of silt.                                                     |                       |                               | 200                                |                                                                                |
|                      |             |   |   |         |       |                                 | 1                  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, brown, trace of silt.                                                    | M/W                   | MD/D                          | 300                                |                                                                                |
|                      |             |   |   |         |       |                                 | 3                  |                 |             | SP                       | <b>SAND:</b> fine to medium grained, dark brown, trace of silt.                                               | D/M                   | VD                            | 400                                |                                                                                |
|                      |             |   |   |         |       |                                 | 2                  |                 |             | SC                       | <b>CLAYEY SAND:</b> fine to coarse grained, grey, medium plasticity fines.                                    | W                     | MD                            |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 2                  |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, pale grey, fine to medium grained sand.                         | M                     | VSt                           | x                                  |                                                                                |
|                      |             |   |   |         |       |                                 | 3                  |                 |             |                          |                                                                                                               |                       | St                            | x                                  |                                                                                |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          | Borehole BH47 terminated at 3m                                                                                |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 1                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 4                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 0                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 5                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | -1                 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 6                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | -2                 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 7                  |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | -3                 |                 |             |                          |                                                                                                               |                       |                               |                                    |                                                                                |
|                      |             |   |   |         |       |                                 | 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>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. **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                           |  |
|                      |             |         |       |                                 |                    | 3               |             |                          |                                                                                                               |                       |                               | 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> 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. **BH50**

# 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: 509397.734 slope: -90° R.L. Surface: 2.828  
hole diameter: 100 mm Northing 7035025.736 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                  |             | 2 | 3 | N       |       |                                 | 2                  | 1               |             | SM                       | <b>SILTY SAND:</b> fine to medium grained, dark grey, trace of organics.                                                                     | M                     | MD                                                                                          |                             |            | DIST PP=160kPa<br><br>DIST PP=250kPa |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             | SP                       | <b>SAND:</b> fine to medium grained, grey/brown, trace of silt.<br>...colour changing to dark brown.<br><br>...colour changing to pale grey. | M/W                   | VD                                                                                          |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              | W                     | D                                                                                           |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              | SC                    | <b>CLAYEY SAND:</b> fine to coarse grained, pale brown and pale grey, low plasticity fines. |                             |            |                                      | D/M        |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             | CH                       | <b>SANDY CLAY:</b> medium to high plasticity, orange/red and pale grey, fine to medium grained sand.<br><br>...colour changing to pale grey. | M                     | St                                                                                          |                             |            |                                      | X          |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              | VSt                   | X                                                                                           |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |
|                      |             |   |   |         |       |                                 |                    |                 |             |                          |                                                                                                                                              |                       |                                                                                             |                             |            |                                      |            |                                          |

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                         |                                                                                                                                                                                                       |
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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 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 |
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# Engineering Log - Borehole

Borehole No. **BH51**

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: 509510.506   |                               |                                                                |                                          |  |  | slope: -90° |  |  |  |  |  | R.L. Surface: 2.978 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| hole diameter:            |             |    |                                                                                         |         |       | 100 mm                          |    |                 |                                                                             |                                                                                         |                                                                                                               | Northing 7035077.122  |                               |                                                                |                                          |  |  | 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  | N                                                                                       | ASS     | 2     | 1                               |    | SM              | SILTY SAND: fine to medium grained, dark grey, with organics.               | M                                                                                       | L                                                                                                             | X                     | DIST PP=150kPa                |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    | SP              | SAND: fine to medium grained, grey.                                         |                                                                                         | L/MD                                                                                                          |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    | SP              | SAND: fine to medium grained, dark brown. ...colour changing to pale brown. |                                                                                         | VD                                                                                                            |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    |                 | ...colour changing to pale brown/grey.                                      |                                                                                         | MD                                                                                                            |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    |                 | SC                                                                          | CLAYEY SAND: fine to coarse grained, pale grey/orange and red, medium plasticity fines. | St                                                                                                            |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    |                 | CH                                                                          | SANDY CLAY: medium to high plasticity, pale grey and red, fine to medium grained sand.  |                                                                                                               |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             | SC | CLAYEY SAND: fine to coarse grained, orange/red and pale grey, medium plasticity fines. | M/W     | MD    |                                 |    |                 |                                                                             |                                                                                         |                                                                                                               |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                           |             |    |                                                                                         |         |       |                                 |    |                 |                                                                             |                                                                                         |                                                                                                               |                       |                               |                                                                |                                          |  |  |             |  |  |  |  |  |                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Borehole No. **BH52**

# 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: 509614.286        |       | slope: -90°                                                                                                                              |    | R.L. Surface: 3.311                                                                                                                                                                                                                           |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
| hole diameter:                                                                           |             | 100 mm    |   | Northing 7035158.052       |       | 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                                                                                                                   | moisture<br>condition                                                                                                         | consistency/<br>density index | pocket<br>penetro-<br>meter                                                                                                                                       | structure and<br>additional observations |
| ADT                                                                                      | 1           | 2         | 3 | N                          |       |                                                                                                                                          |    |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          | soil type: plasticity or particle characteristics,<br>colour, secondary and minor components.                              | M                                                                                                                             | L                             | 100<br>200<br>300<br>400                                                                                                                                          |                                          |
|                                                                                          |             |           |   |                            |       | D                                                                                                                                        | -3 |                                                                                                                                                                                                                                               |             | 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. |                                                                                                                               | L/MD                          |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          |    | 1                                                                                                                                                                                                                                             |             |                                                                                                                                                                                                                                                                                                                          | ...colour changing to pale grey.<br>...colour changing to dark brown.                                                      | M/W<br>M                                                                                                                      | MD<br>VD                      |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       | ASS                                                                                                                                      | -2 |                                                                                                                                                                                                                                               |             | SP                                                                                                                                                                                                                                                                                                                       | SAND: fine to medium grained, dark brown, with<br>silt and trace of clay fines.                                            | W                                                                                                                             | MD                            |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          |    | 2                                                                                                                                                                                                                                             |             | SC                                                                                                                                                                                                                                                                                                                       | CLAYEY SAND: fine to medium grained,<br>grey/brown, low plasticity fines.<br>...colour changing to pale grey.              | M/W                                                                                                                           |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -1 |                                                                                                                                                                                                                                               |             | CL                                                                                                                                                                                                                                                                                                                       | SANDY CLAY: medium plasticity, pale grey, fine<br>to medium grained sand.                                                  | M                                                                                                                             | St                            | X                                                                                                                                                                 | DIST PP=180kPa                           |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          |    | 3                                                                                                                                                                                                                                             |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               | X                                                                                                                                                                 | DIST PP=180kPa                           |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -0 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          | Borehole BH52 terminated at 3m                                                                                             |                                                                                                                               |                               |                                                                                                                                                                   | LIMIT OF INVESTIGATION                   |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -4 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -1 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -2 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -3 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -4 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -5 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -6 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -7 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
|                                                                                          |             |           |   |                            |       |                                                                                                                                          | -8 |                                                                                                                                                                                                                                               |             |                                                                                                                                                                                                                                                                                                                          |                                                                                                                            |                                                                                                                               |                               |                                                                                                                                                                   |                                          |
| method                                                                                   |             |           |   | support                    |       | penetration                                                                                                                              |    | water                                                                                                                                                                                                                                         |             | 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>N nil |       | 1 2 3 4<br><br>no resistance<br>ranging to<br>refusal |    | 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. **BH53**

# 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: 509690.015 slope: -90° R.L. Surface: 3.199  
hole diameter: 100 mm Northing 7035199.353 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  |                                                                                                                                                                                                                                                                                                                                                          |             | SM                       | SILTY SAND: fine to medium grained, dark grey, trace of organics.                                             | M                                                                                                                                                                                               | L                             |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | SAND: fine to medium grained, grey.                                                                           |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          | ...colour changing to grey/brown.                                                                             |                                                                                                                                                                                                 | MD                            |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          | ...colour changing to dark brown.                                                                             | D/M                                                                                                                                                                                             | VD                            |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1  |                                                                                                                                                                                                                                                                                                                                                          |             | SP                       | SAND: fine to medium grained, dark brown, with silt and trace of clay fines.                                  | W                                                                                                                                                                                               | MD                            |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2  |                                                                                                                                                                                                                                                                                                                                                          |             | SC                       | CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.                                      |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.                                | M                                                                                                                                                                                               | VSt                           | x                                  | DIST PP=270kPa                                                                                                                                                                                        |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1  |                                                                                                                                                                                                                                                                                                                                                          |             | CH                       | SILTY CLAY: high plasticity, pale grey, trace of sand.                                                        |                                                                                                                                                                                                 |                               | x                                  | DIST PP=320kPa                                                                                                                                                                                        |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0  |                                                                                                                                                                                                                                                                                                                                                          |             |                          | Borehole BH53 terminated at 3m                                                                                |                                                                                                                                                                                                 |                               |                                    | LIMIT OF INVESTIGATION                                                                                                                                                                                |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4  |                                                                                                                                                                                                                                                                                                                                                          |             |                          |                                                                                                               |                                                                                                                                                                                                 |                               |                                    |                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                        |             |   |   |         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -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 |  |