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DWG95012.GDW

FG5825 BRUCE HWY COORDY-CURRA SECTION A BHS.GPJ

LIB 01.GLB Log A ENGINEERING BOREHOLE LOG W LITHOLOGY

DMR

ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

__BH026__ **BOREHOLE No** _1_ of _2_ SHEET REFERENCE No H10576

BRUCE HIGHWAY (COORDY - CURRA) SECTION A GEOTECHNICAL INVESTIGATION **PROJECT** Cut 11 LOCATION COORDINATES 485953.1 E; 7080881.9 N PROJECT No FG5825 DATE STARTED 13/7/09 GRID DATUM MGA94 SURFACE R.L. __167.79m PLUNGE _____ JOB No 128/10A/901 HEIGHT DATUM __AHD_ BEARING _ _ _ _ _ DATE COMPLETED 13/7/09 DRILLER R&D Drilling R.L. RQD INTACT DEFECT ADDITIONAL DATA ()% STRENGTH SPACING (m) (E) MATERIAL (mm) DEPTH (LITHOLOGY AND SAMPLES SAMPLE DESCRIPTION TESTS TOWAND CAN CORP. TO SERVICE CORP. TO SER CORE 28888 **TEST RESULTS** SETET REC % 0 Clayey SILT Pale grey with minor mottled red iron staining, moist, hard. 2,23,14 (CI-Organics throughout. SPT ML N = 37166.29 SILTSTONE (XW): 8,14,21 Datgel CPT Tool gINt Add-in 12/05/2010 10:30 В SPT Generally exhibits engineering properties XW N=35 of pale grey to mottled red, moist, hard 165.79 clayey silt. (42)SILTSTONE (HW): HΜ Grey with red mottling, fine grained Is(50) = 0.07MPa0 165.26 Is(50) = 0.05MPaX SILTSTONE (MW): Pale grey with mottled red and orange, fine grained, medium bedded. Is(50) = 0.07MPaDefects generally dip at <10° and are open. Is(50) = 0.14MPa 0 100 Defect surfaces are typically planar, Is(50) = 0.04MPa X (53)smooth, iron stained. Is(50) = 0.04MPao 3.41 - 3.75m: Pale brown, medium grained, thinly bedded, HW Sandstone. Is(50) = 0.11MPaX 100 Is(50) = 0.10MPa (0) MW 100 Is(50) = 0.12MPa X O (48)Is(50) = 0.17MPa Is(50) = 0.21MPa Is(50) = 0.19MPa0 Is(50) = 0.15MPaX 0 Is(50) = 0.15MPaDetailed defect descriptions are shown on Is(50) = 0.19MPa Form GEOT533/8 attached. 100 Is(50) = 0.19MPaO (61) 9 ls(50) = 0.16MPa(See over) X REMARKS Detailed defect descriptions are shown on Form GEOT533/8 attached. Standpipe piezometer installed. LOGGED BY JA.



ENGINEERING BOREHOLE LOG

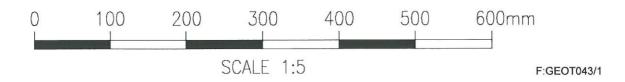
FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/5-2009

| PROJECT | | | AY (COOROY - CURRA) SECTION A GEOTE | CH | NIC/ | AL INVESTIGATION | | | | |
|------------------------|--|--------|--|---------------------------------------|-------|---|--------------|-----------------------|--|-----------------------------|
| LOCATION | | | CUREACE DI 167.70m DILINGE | | | DATE STARTED | | | 953.1 E; 7080881.9 | <u> </u> |
| JOB No | | | SURFACE R.L. <u>167.79m</u> PLUNGE HEIGHT DATUM <u>AHD</u> BEARING | | | | 7000 | | JM <u>MGA94</u> ER <u>R & D Drilling</u> | |
| JOB NO | 120/10/0301 | | HEIGHT DATONAND BEAKING | | | | 13/// | O9 DRIELL | - K K R D DIIIIII M | |
| R.L. | RQD 92 ()% | | | | ဖြ | INTACT DEFECT STRENGTH SPACING | ₀ | ADDITION | AL DATA | |
| DEРТН (m) | BORING BORING () % | 101 | MATERIAL | OGY | ER | (mm) | 07 01 | AN | D | ES |
| DEP | SASSING SERVICE SING SING SING SING SING SING SING SING | SAMPLE | DESCRIPTION | LITHOLOGY | USC | STRENGTH SPACING (mm) ################################## | GRAPHIC LOG | TEST RE | SULTS | SAMPLES |
| 10 157.79 | REC % | Ś | SILTSTONE (MW): (Cont'd) | | 1 | | ō | | Is(50) = 0.17MPa | 0 |
| | | | SILISTONE (MWV). (Conta) | × × × × × × × × × × × × × × × × × × × | | | | ── UCS=1237kPa | Is(50) = 0.21MPa Is(50) = 0.18MPa Is(50) = 0.19MPa Is(50) = 0.24MPa | VOS - |
| -11 | | | Detailed defect descriptions are shown on | × × × × | MW | | | ──UCS=1558kPa | Is(50) = 0.28MPa Is(50) = 0.27MPa Is(50) = 0.34MPa Is(50) = 0.30MPa | v - Ues - x - o - |
| - 12 | 100 (75) | | Form GEOT533/8 attached. | × × × × × × × × × × × × × × × × × × × | | | | — UCS=1594kPa | Is(50) = 0.23MPa Is(50) = 0.26MPa Is(50) = 0.34MPa Is(50) = 0.31MPa Is(50) = 0.23MPa Is(50) = 0.29MPa | X - UCS - X - O - X - O - I |
| 154.49 154.49 | | | SILTSTONE (SW): Dark grey to grey, fine grained. Carbonaceous seams ~1mm throughout. Foliations generally dip at 10°. Defects close to medium spacing. | × × × × × × × × × × × × × × × × × × × | | | | Sandstone interbed | Is(50) = 0.36MPa Is(50) = 0.38MPa Is(50) = 0.26MPa Is(50) = 0.25MPa | x |
| -15 -15 -152.44 | 96 | | Prominent defect sets dip along bedding. SANDSTONE (MW): Pale brown, fine to medium grained, thinly bedded. | | MW | | | | Is(50) = 0.32MPa Is(50) = 0.14MPa | x - o] |
| - 16 17 18 19 | | t de | Defects typically shallow dipping and fresh. Borehole terminated at 15.35m | ed. S | Stand | pipe piezometer installed | 1. | | LOGGED BY | |
| REMARK | S Detailed defec | t des | scriptions are shown on Form GEOT533/8 attach | <u>ed.</u> 9 | Stand | pipe piezometer installed | <u>i.</u> | - | | |
| | | | | | | | | | JA | |

Project: Bruce Highway Upgrade (Cooroy - Curra) Section A

Borehole No: BH26
Start Depth: 2.00m
Finish Depth: 15.35m
Project No: FG5825
H No: 10576

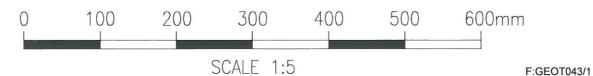




Project: <u>Bruce Highway Upgrade (Cooroy - Curra) Section A</u>

Borehole No: BH26
Start Depth: 2.00m
Finish Depth: 15.35m
Project No: FG5825
H No: 10576





GEOTECHNICAL BRANCH LABORATORY

Materials Services - Brisbane 35 Butterfield Street, HERSTON Q 4006 Phone: (07) 3115 3035 Fax: (07) 3115 3011



DEFECT DESCRIPTIONS OF ENGINEERING BORELOGS

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981)]

BOREHOLE NO.: BH26

SHEET: 1 of 3

REFERENCE NO.: H10576

PROJECT: Bruce Highway (Cooroy – Curra) Section A Geotechnical Investigation

LOCATION: Cut 11

PROJECT NO.: FG5825 SURFACE R.L.: 167.79 DRILLER: R&D Drilling Pty Ltd

JOB NO.: 128/10A/901 DATUM: MGA94 DATE DRILLED: 13/07/09

| DEPTH | DEFECT TYPE | DIP° | PLANARITY | ANARITY ROUGHNESS | | WALL ALTERATION | OTHER |
|-------|----------------|--------|-----------|-------------------|---|--------------------|-----------|
| 2.13 | J | 10° | PI | Sr | 0 | FeSt | |
| 2.36 | J | 10° | PI | S | 0 | Cn | |
| 2.44 | J | 10° | Pl | S | 0 | FeSt | |
| 2.45 | J | 10° | PI | R | 0 | FeSt | |
| 2.53 | J | 70° | PI | S | 0 | FeSt | 20023 |
| 2.68 | J | 10° | lr | R | 0 | FeSt | |
| 2.81 | J | 10° | PI | R | 0 | FeSt | |
| 2.94 | J | 10° | PI | S | 0 | FeSt | |
| 2.94 | J | 80-90° | PI | Sr | 0 | FeSt | 60mm long |
| 3.16 | J | 80-90° | PI | Sr | 0 | FeSt | 40mm long |
| 3.20 | J | 20° | PI | S | 0 | FeSt | |
| 3.23 | J | 10° | PI | Sr | 0 | FeSt | |
| 3.56 | J | 10° | PI | Sr | 0 | Cn | |
| 3.59 | J | 10° | PI | Sr | 0 | Cn | |
| 3.68 | J | 10° | PI | S | 0 | FeSt | |
| 3.78 | J | 10° | Pl | S | 0 | FeSt | |
| 3.84 | J | 10° | PI | S | 0 | FeSt | |
| 4.29 | J | 10° | PI | S | 0 | Cn | |

Abbreviations

| | Abbievialions | | | | | | | | | | |
|----|----------------|------|--------------------------|-------|-----------------------|---------|------------------|--|--|--|--|
| | ROUGHNESS | | WALL ALTERATIONS | | TYPE | OTHER | | | | | |
| R | Rough | FeSt | Iron Stained | J, Js | Joint, Joints | Cln | Clay Infill | | | | |
| Sr | Slightly Rough | W | Weathered | В | Bedding | CLy | Clayey | | | | |
| S | Smooth | Smn | Secondary Mineralisation | BP | Bedding Parting | Со | Coal Seam | | | | |
| SL | Slickensided | Cn | Clean | FP | Foliation Parting | Carb | Carbonaceous | | | | |
| РО | Polished | MnSt | Manganese Stained | LP | Lamination Parting | SI | Sand Infill | | | | |
| | PLANARITY | | APERTURE | CLV | Cleavage | QZ | Quartz | | | | |
| PI | Planar | С | Closed | Fr | Fracture | CA | Calcite | | | | |
| St | Stepped | 0 | Open | SZ | Sheared Zone | Chl | Chlorite | | | | |
| Un | Undulating | F | Filled | CZ | Crushed Zone | In | Incipient | | | | |
| Cu | Curved | T | Tight | BZ | Broken Zone | Int | Intersecting | | | | |
| lr | Irregular | | | HFZ | Highly Fractured Zone | Lam (s) | Lamination (s) | | | | |
| | | | | WS | Weathered Seam | Di | Drilling Induced | | | | |
| | | | | Vn | Vein | Н | Horizontal | | | | |
| | | | | | | V | Vertical | | | | |

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

BOREHOLE NO.: BH26
SHEET: 2 of 3

REFERENCE NO.: H10576

| DEPTH DEFECT TYP | | DIP° | PLANARITY ROUGHNESS | | APERTURE | WALL ALTERATION | OTHER |
|------------------|------------|------|---------------------|----|----------|-----------------|--|
| 4.42 | J 20° PI S | | 0 | Cn | | | |
| 4.51 | J | 10° | PI | S | 0 | FeSt | |
| 5.05 | J | 20° | PI | St | 0 | FeSt | |
| 5.12 | J | 30° | PI | | С | FeSt | |
| 5.15 | J | 40° | PI | S | 0 | FeSt | |
| 5.19 | J | 10° | PI | S | 0 | FeSt | |
| 5.22 | J | 10° | PI | S | 0 | FeSt | |
| 5.31 | J | 10° | lr . | R | 0 | FeSt | |
| 5.34 | J | 10° | PI | S | 0 | FeSt | |
| 5.43 | J | 10° | PI | S | 0 | FeSt | |
| 5.46 | J | 10° | PI | S | 0 | FeSt | |
| 5.48 | J | 10° | PI | | С | FeSt | - |
| 5.75 | J | 10° | PI | S | 0 | FeSt | |
| 5.82 | j | 60° | PI | | С | FeSt | |
| 5.97 | J | 20° | PI | | С | FeSt | |
| 6.11 | j | 45° | PI | | c | FeSt | |
| 6.31 | J | 20° | PI | S | 0 | FeSt | |
| 6.40 | J | 40° | PI | S | 0 | Cn | |
| 6.45 | J | 10° | PI | 3 | c | FeSt | |
| | J | 60° | PI PI | S | 0 | Cn | |
| 6.6 | | | | | | Cn | |
| 6.75 | J | 10° | PI | S | 0 | 5.0 | |
| 7.05 | J | 50° | PI | | С | FeSt | |
| 7.25 | J | 85° | PI | S | 0 | Cn | |
| 7.31 | J | 10° | PI | S | 0 | FeSt | |
| 7.33 | J | 10° | PI | Sr | 0 | FeSt | |
| 7.48 | J | 10° | PI | S | 0 | FeSt | |
| 7.78 | J | 25° | PI | S | 0 | FeSt | |
| 7.84 | J | 25° | PI | S | 0 | FeSt | |
| 7.98 | J | 20° | Pl | S | 0 | FeSt | |
| 8.04 | J | 10° | PI | S | 0 | FeSt | Storen |
| 8.13 | J | 10° | PI | S | 0 | FeSt | |
| 8.34 | J | 30° | PI | S | 0 | FeSt | And the state of t |
| 8.70 | J | 60° | PI | S | 0 | Cn | 2,150,000,000,000 |
| 8.94 | J | 10° | PI | S | 0 | FeSt | |
| 8.99 | J | 10° | PI | S | 0 | FeSt | |
| 9.05 | J | 10° | PI | S | С | FeSt | |
| 9.18 | J | 10° | PI | S | 0 | MnSt | |
| 9.27 | J | 20° | PI | S | 0 | MnSt | |
| 9.38 | J | 30° | 1r | S | 0 | MnSt | |
| 9.42 | J | 10° | PI | S | 0 | MnSt | |
| 9.61 | J | 20° | Un | | С | | |
| 10.02 | J | 10° | PI | S | 0 | FeSt | |
| 10.22 | J | 10° | PI | S | 0 | FeSt | |
| 10.29 | J | 10° | PI | S | 0 | FeSt | |
| 11.12 | J | 80° | lr | Sr | 0 | Cln | 100 mm long |
| 13.26 | J | 10° | PI | S | 0 | Cn | , se miniong |
| 13.32 | J | 10° | PI | S | 0 | Cn | 7 |
| 13.34 | J | 10° | Pl | S | 0 | Cn | |
| 13.55 | J | 15° | Pl | S | 0 | Cn | |
| | J | 15° | PI | S | 0 | Cn | |
| 13.61 | | | | | | | |
| 13.65 | J | 10° | PI | S | 0 | Cn | |
| 13.96 | J | 10° | PI | R | 0 | Cn | |
| 14.07 | J | 20° | PI | S | 0 | Cn | |
| 14.17 | J | 20° | PI | S | 0 | Cn | |
| 14.24 | J | 10° | PI | Sr | 0 | Cn | |
| 14.34 | J | 15° | PI | S | 0 | Cn | |

BOREHOLE NO.: BH26
SHEET: 3 of 3

REFERENCE NO.: H10576

| DEPTH | DEFECT TYPE | DIP° | PLANARITY | ROUGHNESS | APERTURE | WALL ALTERATION | OTHER |
|-------------|-------------|------|-----------|-----------|----------|-----------------|--------|
| 14.51 | J | 10° | PI | Sr | 0 | FeSt | |
| 14.90 | j | 20° | PI | Sr | 0 | Cn | 270.20 |
| 14.94 | J | 10° | PI | R | 0 | FeSt | |
| 15.18-15.22 | BZ | | | | | | WS |