**Project Name:** DD
**Project Code:** DD **Site ID:** B561 **Observation ID:** 1
**Agency Name:** CSIRO Division of Soils (QLD)

## Site Information

| | | | |
|---|---|---|---|
| **Desc. By:** | C.H. Thompson | **Locality:** | |
| **Date Desc.:** | 05/10/66 | **Elevation:** | 396 metres |
| **Map Ref.:** | Sheet No. : 9242 1:100000 | **Rainfall:** | 650 |
| **Northing/Long.:** | 151.516666666667 | **Runoff:** | Rapid |
| **Easting/Lat.:** | -27.55 | **Drainage:** | Moderately well drained |

## Geology

| | | | |
|---|---|---|---|
| **ExposureType:** | Soil pit | **Conf. Sub. is Parent. Mat.:** | No Data |
| **Geol. Ref.:** | CZW | **Substrate Material:** | Undisturbed soil core, Unconsolidated material (unidentified) |

## Land Form

| | | | |
|---|---|---|---|
| **Rel/Slope Class:** | No Data | **Pattern Type:** | No Data |
| **Morph. Type:** | Mid-slope | **Relief:** | No Data |
| **Elem. Type:** | Pediment | **Slope Category:** | No Data |
| **Slope:** | 3.5 % | **Aspect:** | No Data |

**Surface Soil Condition (dry):** Self-mulching

**Erosion:**

## Soil Classification

**Australian Soil Classification:**
Epicalcareous-Epihypersodic Self-Mulching Black Vertosol
**ASC Confidence:**
All necessary analytical data are available.

**Mapping Unit:** N/A
**Principal Profile Form:** Ug5.16
**Great Soil Group:** Black earth

**Site Disturbance:** No effective disturbance other than grazing by hoofed animals

**Vegetation:**
Tall Strata - Tussock grass, 0.26-0.5m, Closed or dense. *Species includes - Panicum queenslandicum, Chloris pectinata

**Surface Coarse Fragments:** No surface coarse fragments

## Profile Morphology

| | | |
|---|---|---|
| A1 | 0 - 0.05 m | Very dark grey (10YR3/1-Moist); ; Medium clay; Strong grade of structure, 2-5 mm, Granular; Moist; Very weak consistence; Very few (0 - 2 %), Calcareous, Medium (2 -6 mm), Nodules; Field pH 8 (pH meter); Clear change to - |
| B2 | 0.05 - 0.1 m | Very dark grey (10YR3/1-Moist); ; Heavy clay; Strong grade of structure, 20-50 mm, Angular blocky; Moist; Firm consistence; Few (2 - 10 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.3 (pH meter); |
| B2 | 0.1 - 0.2 m | Very dark grey (10YR3/1-Moist); ; Heavy clay; Strong grade of structure, 20-50 mm, Angular blocky; Moist; Firm consistence; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.6 (pH meter); Diffuse change to - |
| B2 | 0.2 - 0.3 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Moderate grade of structure, 20-50 mm, Angular blocky; Moist; Firm consistence; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.8 (pH meter); |
| B2 | 0.3 - 0.45 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Moderate grade of structure, Lenticular; 10-20 mm, Angular blocky; Moist; Firm consistence; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 9.1 (pH meter); Diffuse change to - |
| B2 | 0.45 - 0.6 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Slightly plastic; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 9.1 (pH meter); |
| B2 | 0.6 - 0.9 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Slightly plastic; Very few (0 - 2 %), Calcareous, Medium (2 -6 mm), Nodules; Field pH 9 (pH meter); |
| B2 | 0.9 - 1.05 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Slightly plastic; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.9 (pH meter); Diffuse change to - |

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| | | |
|---|---|---|
| B2 | 1.05 - 1.2 m | Dark greyish brown (10YR4/2-Moist); ; Heavy clay; Strong grade of structure, 20-50 mm, Lenticular; 10-20 mm, Lenticular; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, Medium (2 -6 mm), Nodules; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.9 (pH meter); |
| B2 | 1.2 - 1.5 m | Dark greyish brown (10YR4/2-Moist); ; Heavy clay; Strong grade of structure, 20-50 mm, Lenticular; 10-20 mm, Lenticular; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, Medium (2 -6 mm), Nodules; Common (10 - 20 %), Calcareous, Medium (2 -6 mm), Soft segregations; Field pH 8.2 (pH meter); Clear change to - |
| B2 | 1.5 - 1.65 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, , Nodules; Common (10 - 20 %), Calcareous, , Soft segregations; Very few (0 - 2 %), Gypseous, , Crystals; Field pH 8.9 (pH meter); |
| B2 | 1.65 - 1.8 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, , Nodules; Common (10 - 20 %), Calcareous, , Soft segregations; Very few (0 - 2 %), Gypseous, , Crystals; Field pH 8.9 (pH meter); |
| B2 | 1.8 - 1.85 m | Very dark greyish brown (10YR3/2-Moist); ; Heavy clay; Strong grade of structure, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, , Nodules; Common (10 - 20 %), Calcareous, , Soft segregations; Very few (0 - 2 %), Gypseous, , Crystals; Field pH 9.2 (pH meter); Sharp change to - |
| D | 1.85 - 1.95 m | Dark greyish brown (10YR4/2-Moist); , 10YR31, 20-50% , 5-15mm, Faint; , 20-50% , 5-15mm, Faint; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; Very few (0 - 2 %), Manganiferous, , Soft segregations; Very few (0 - 2 %), Calcareous, , Soft segregations; Field pH 9 (pH meter); |
| D | 1.95 - 2.1 m | Dark grey (10YR4/1-Moist); , 10YR43, 20-50% , 5-15mm, Faint; , 10YR56, 20-50% , 5-15mm, Faint; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; 2-10%, Shale, coarse fragments; Few (2 - 10 %), Manganiferous, , Soft segregations; Very few (0 - 2 %), Calcareous, , Soft segregations; Field |
| D | 2.1 - 2.41 m | Dark grey (10YR4/1-Moist); , 10YR43, 20-50% , 5-15mm, Faint; , 10YR56, 20-50% , 5-15mm, Faint; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; 2-10%, Shale, coarse fragments; Few (2 - 10 %), Manganiferous, , Soft segregations; Very few (0 - 2 %), Calcareous, , Soft segregations; Field |
| D | 2.41 - 2.54 m | Light grey (2.5Y7/1-Moist); , 10YR56, 10-20% , 15-30mm, Distinct; , N50, 10-20% , 15-30mm, Distinct; Heavy clay; Strong grade of structure, 100-200 mm, Lenticular; 20-50 mm, Angular blocky; Moist; Very firm consistence; 2-10%, Shale, coarse fragments; Field pH 8.5 (pH meter); |

## Morphological Notes

## Observation Notes

SOME CALCAREOUS NODULES WITH THE SOFT SEGRATIONS THROUGHOUT BELOW 5CM DEPTH: SOIL FORMED IN DOMINANTLY BASALTIC CLAY COLLUVIUM OVER WALLOON SEDIMENTS BELOW 1.85M:

## Site Notes

MT. RUSSELL

**Project Name:** DD
**Project Code:** DD **Site ID:** B561 **Observation ID:** 1
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## Laboratory Test Results:

| Depth | pH | 1:5 EC | Exchangeable Cations Ca | Mg | K | Na | Exchangeable Acidity | CEC | ECEC | ESP |
|---|---|---|---|---|---|---|---|---|---|---|
| m | | dS/m | | | | Cmol (+)/kg | | | | % |
| 0 - 0.05 | 8A | 0.19A | 40.1B | 9.9 | 1.5 | 0.35 | | | | |
| 0.05 - 0.1 | 8.3A | 0.15A | 33B | 11 | 0.55 | 0.4 | | | | |
| 0.1 - 0.2 | 8.6A | 0.18A | 40.4B | 13.3 | 0.29 | 1.3 | | | | |
| 0.2 - 0.3 | 8.8A | 0.24A | 36B | 16.2 | 0.32 | 4 | | | | |
| 0.3 - 0.45 | 9.1A | 0.38A | | | | | | | | |
| 0.45 - 0.6 | 9.1A | 0.68A | 29B | 23.3 | 0.29 | 8.6 | | | | |
| 0.6 - 0.9 | 9A | 1.54A | | | | | | | | |
| 0.9 - 1.05 | 8.9A | 1.24A | 30B | 22.9 | 0.35 | 11.7 | | | | |
| 1.05 - 1.2 | 8.9A | 1.32A | 29B | 21.2 | 0.43 | 12.1 | | | | |
| 1.2 - 1.5 | 8.2A | 1.38A | 24B | 16.4 | 0.33 | 9.9 | | | | |
| 1.5 - 1.65 | 8.9A | 1.32A | | | | | | | | |
| 1.65 - 1.8 | 8.9A | 1.32A | | | | | | | | |
| 1.8 - 1.85 | 9.2A | 1.38A | | | | | | | | |
| 1.85 - 1.95 | 9A | 1.43A | | | | | | | | |
| 1.95 - 2.1 | 9A | 1.38A | | | | | | | | |
| 2.1 - 2.41 | 8.8A | 1.41A | | | | | | | | |
| 2.41 - 2.54 | 8.5A | 1.03A | | | | | | | | |

| Depth | CaCO3 | Organic C | Avail. P | Total P | Total N | Total K | Bulk Density | Particle Size Analysis GV | CS | FS | Silt | Clay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| m | % | % | mg/kg | % | % | % | Mg/m3 | | | % | | |
| 0 - 0.05 | 3.1C | 3.26A | 10A | 0.046A | 0.22B | 0.56A | 1.22 | | 7C | 28 | 12 | 43 |
| | | | 34B | | | | | | | | | |
| 0.05 - 0.1 | 7.2C | 2.03A | 8.6A | 0.038A | 0.14B | 0.47A | 1.32 | 1 | 6C | 23 | 11 | 48 |
| | | | 27B | | | | | | | | | |
| 0.1 - 0.2 | 12C | 1.34A | 7A | 0.035A | 0.086B | 0.47A | | 2 | 4C | 21 | 12 | 48 |
| | | | 27B | | | | | | | | | |
| 0.2 - 0.3 | 14C | 0.87A | | 0.03A | 0.053B | 0.52A | | | 4C | 19 | 12 | 48 |
| 0.3 - 0.45 | 13C | | | 0.03A | | 0.5A | 1.37 | 2 | | | | |
| 0.45 - 0.6 | 13C | 0.64A | | 0.029A | 0.037B | 0.52A | | | 4C | 18 | 12 | 50 |
| 0.6 - 0.9 | 11C | | | 0.027A | | 0.55A | 1.44 | | | | | |
| 0.9 - 1.05 | 9.1C | | | 0.026A | 0.022B | 0.54A | | | 5C | 19 | 15 | 53 |
| 1.05 - 1.2 | 7.5C | | | 0.027A | 0.017B | 0.58A | | | 4C | 19 | 15 | 53 |
| 1.2 - 1.5 | 3.7C | | | 0.017A | 0.02B | 0.42A | | 2 | 4C | 23 | 16 | 52 |
| 1.5 - 1.65 | 3C | | | | | | | | | | | |
| 1.65 - 1.8 | 3C | | | | | | | | | | | |
| 1.8 - 1.85 | 6.1C | | | | | | | 2 | 5C | 17 | 17 | 53 |
| 1.85 - 1.95 | | | | | | | | | | | | |
| 1.95 - 2.1 | | | | | | | | | | | | |
| 2.1 - 2.41 | | | | | | | | 3 | 4C | 16 | 26 | 52 |
| 2.41 - 2.54 | | | | | | | | | | | | |

| Depth | COLE | Gravimetric/Volumetric Water Contents Sat. | 0.05 Bar | 0.1 Bar | 0.5 Bar | 1 Bar | 5 Bar | 15 Bar | K sat | K unsat |
|---|---|---|---|---|---|---|---|---|---|---|
| m | | | | g/g - m3/m3 | | | | | mm/h | mm/h |
| 0 - 0.05 | | | | 0.38F | | | | 0.25H | | |
| 0.05 - 0.1 | | | | 0.45F | | | | 0.34H | | |
| 0.1 - 0.2 | | | | | | | | | | |
| 0.2 - 0.3 | | | | | | | | | | |

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| | | |
|---|---|---|
| 0.3 - 0.45 | 0.45F | 0.35H |
| 0.45 - 0.6 | | |
| 0.6 - 0.9 | 0.46F | 0.33H |
| 0.9 - 1.05 | | |
| 1.05 - 1.2 | | |
| 1.2 - 1.5 | | |
| 1.5 - 1.65 | | |
| 1.65 - 1.8 | | |
| 1.8 - 1.85 | | |
| 1.85 - 1.95 | | |
| 1.95 - 2.1 | | |
| 2.1 - 2.41 | | |
| 2.41 - 2.54 | | |

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**Laboratory Analyses Completed for this profile**

| | |
|---|---|
| 10A1 | Total sulfur - X-ray fluorescence |
| 15A2_CA | Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_K | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_MG | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 15A2_NA | Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts |
| 17A1 | Total potassium - X-ray fluorescence |
| 19B_NR | Calcium Carbonate (CaCO3) - Not recorded |
| 2_LOI | Loss on Ignition (%) |
| 2A1 | Air-dry moisture content |
| 3A1 | EC of 1:5 soil/water extract |
| 4A1 | pH of 1:5 soil/water suspension |
| 5A2 | Chloride - 1:5 soil/water extract, automated colour |
| 6A1 | Organic carbon - Walkley and Black |
| 7_NR | Total nitrogen (%) - Not recorded |
| 9A1 | Total phosphorus - X-ray fluorescence |
| 9B_9C | Available P (mg/kg) - Bicarbonate P - 0.5M NaHCO3 extractable |
| 9G_BSES | Available P (mg/kg) - Acid P - 0.005M H2SO4 (BSES) |
| P10_GRAV | Gravel (%) |
| P10_NR_C | Clay (%) - Not recorded |
| P10_NR_CS | Coarse sand (%) - Not recorded |
| P10_NR_FS | Fine sand (%) - Not recorded |
| P10_NR_Z | Silt (%) - Not recorded |
| P3A1 | Bulk density - g/cm3 |
| P3B3VLe004 | 0.04 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on suction plate |
| P3B3VLe01 | 0.1 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on suction plate |
| P3B3VLe03 | 0.3 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on suction plate |
| P3B3VLe06 | 0.6 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on pressure plate |
| P3B3VLe15 | 15 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on pressure plate |
| P3B3VLe2 | 2 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on pressure plate |
| P3B3VLe7 | 7 BAR Moisture m3/m3 - Volumetric using undisturbed 60mm diameter and 34mm height core on pressure plate |