

**Project Name:** Soil Studies in the Lower Namoi Valley  
**Project Code:** EDGEROI **Site ID:** na003 **Observation ID:** 1  
**Agency Name:** CSIRO Division of Soils (QLD)

#### Site Information

<b>Desc. By:</b> W.T. Ward	<b>Locality:</b> stock route, at Bingara Road lime pit
<b>Date Desc.:</b> 06/10/87	<b>Elevation:</b> 227 metres
<b>Map Ref.:</b> Sheet No. : 8837_S 1:50000	<b>Rainfall:</b> No Data
<b>Northing/Long.:</b> 6647500 AMG zone: 55	<b>Runoff:</b> No Data
<b>Easting/Lat.:</b> 771230 Datum: AGD66	<b>Drainage:</b> No Data

#### Geology

<b>ExposureType:</b> Undisturbed soil core	<b>Conf. Sub. is Parent. Mat.:</b> No Data
<b>Geol. Ref.:</b> No Data	<b>Substrate Material:</b> No Data

#### Land Form

<b>Rel/Slope Class:</b> No Data	<b>Pattern Type:</b> No Data
<b>Morph. Type:</b> No Data	<b>Relief:</b> No Data
<b>Elem. Type:</b> Hillslope	<b>Slope Category:</b> Very gently sloped
<b>Slope:</b> 1 %	<b>Aspect:</b> 210 degrees

**Surface Soil Condition (dry):** Firm

#### Erosion:

#### Soil Classification

<b>Australian Soil Classification:</b> N/A	<b>Mapping Unit:</b> N/A
<b>ASC Confidence:</b> Confidence level not specified	<b>Principal Profile Form:</b> Uc5.12
	<b>Great Soil Group:</b> Rendzina

**Site Disturbance:** Cultivation. Rainfed

#### Vegetation:

#### Surface Coarse Fragments:

#### Profile Morphology

A11	0 - 0.02 m	Greyish brown (10YR5/2-Moist); Grey (10YR5/1-Dry); ; Fine sandy loam; Weak grade of structure, Angular blocky; Rough-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very weak consistence; 0-2%, fine gravelly, 2-6mm, subangular, Quartz, coarse fragments; Field pH 8.5 (pH meter); Common, very fine (0-1mm) roots; Gradual, Smooth change to -
A12	0.02 - 0.1 m	Greyish brown (10YR5/2-Moist); , 10YR21, 2-10% , 5-15mm, Distinct; Fine sandy loam; Moderate grade of structure, 20-50 mm, Columnar; Rough-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very weak consistence; 0-2%, fine gravelly, 2-6mm, subangular, Quartz, coarse fragments; Field pH 8.5 (pH meter); Common, very fine (0-1mm) roots; Sharp, Irregular change to -
A13	0.1 - 0.2 m	Greyish brown (10YR5/2-Moist); , 10YR21, 2-10% , 5-15mm, Distinct; Fine sandy loam; Moderate grade of structure, 20-50 mm, Columnar; Rough-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very weak consistence; 0-2%, fine gravelly, 2-6mm, subangular, Quartz, coarse fragments; Very few (0 - 2 %), Calcareous, Coarse (6 - 20 mm), Nodules; Field pH 8.5 (pH meter); Common, very fine (0-1mm) roots; Sharp, Irregular change to -
C1	0.2 - 0.55 m	White (10YR8/1-Moist); , 7.5YR42, 2-10% , 5-15mm, Prominent; Light clay; Strong grade of structure, 20-50 mm, Columnar; Rough-ped fabric; Medium, (5 - 10) mm crack; Moderately moist; Rigid consistence; Very few (0 - 2 %), Manganiferous, Fine (0 - 2 mm), Nodules; Common (10 - 20 %), Calcareous, Extremely coarse (> 60 mm), Nodules; Field pH 8.5 (pH meter);
C2	0.55 - 1 m	White (10YR8/1-Moist); , 7.5YR42, 2-10% , 5-15mm, Prominent; Light clay; Massive grade of structure; Weak grade of structure, 10-20 mm, Lenticular; Earthy fabric; Moderately moist; Very firm consistence; Common (10 - 20 %), Calcareous, Very coarse (20 - 60 mm), Nodules; Field pH 8.5 (pH meter);
C3	1 - 2.4 m	Very pale brown (10YR8/3-Moist); , 10YR32, 2-10% , 15-30mm, Prominent; Silty clay; Massive grade of structure; Moderate grade of structure, 10-20 mm, Lenticular; Earthy fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very firm consistence; Field pH 8.8 (pH meter); Clear, Smooth change to -
D1	2.4 - 3.05 m	Light grey (10YR7/2-Moist); , 10YR81, 10-20% , 5-15mm, Distinct; , N30, 10-20% , 5-15mm, Prominent; Silty loam; Massive grade of structure; Fine, (0 - 5) mm crack; Moderately moist; Strong consistence; 20-50%, medium gravelly, 6-20mm, subangular, Charcoal, coarse fragments; Field pH 8.8 (pH meter);

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D2      3.05 - 4.09 m      Light brownish grey (2.5Y6/2-Moist); , 7.5YR58, 0-2% , 0-5mm, Distinct; , 10YR32, 0-2% , 5-15mm, Distinct; Medium clay; Weak grade of structure, 10-20 mm, Subangular blocky; Smooth-ped fabric; Fine, (0 - 5) mm crack; Moderately moist; Very firm consistence; 0-2%, fine gravelly, 2-6mm, subangular, Quartz, coarse fragments; Very few (0 - 2 %), Calcareous, Medium (2 -6 mm), Veins; Field pH 8.8 (pH meter);

#### **Morphological Notes**

A11      Samples 00301-5 described in the field by DMcG on 17/9/86 as coring was not successful. A1 was subdivided on pedality. 00304 contains fragments of kunkar. The black fragments in 00307 are either charcoal or manganese. They are thoroughly cemented by lime above 250cm, where there is also effervescence in the fine earth. The topsoil also produces effervescence with acid, and the samples include several small light grey (10YR7/2) carbonate nodules. Some small pieces of quartz grit occur at 240-260cm. 250-260cm might possibly be the top of a buried soil; the top of the next core shows an apparent prism face and blocky structures. There is also humus stain in a worm or root channel. Below 250cm there is no effervescence in the fine earth, but carbonate segregations, described at 350cm, occur at 380-400cm beside organic stains around a root or faunal passage. The weathering stains at 350cm occur around the included 5YR3/3 sandstone fragments. At 400cm the core includes coarse fragments of ironstone and ferruginous sandstone, with small patches of secondary carbonate. At this level the weathering stains are also more common (20-50%). From 200-210cm we had to use the rock bit. The disturbed material contained carbonate-cemented marl with black stains. This is a carbonate deposit to 250cm, over an alluvial clay, possibly with soil. Light clay from 30-80cm contains many carbonate nodule fragments.

#### **Observation Notes**

Parent Rock: residual, marl, Rolling Downs Group

#### **Site Notes**

At disused lime pit near 'Cooyong', Bingara Road. Drilling nearby provided 0-30cm, then we gave up coring on encountering impenetrable kunkar. Rock bit to ca. 2m where we enter silty clay, passing to grey-brown unctuous clays sampled at 375

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**Laboratory Test Results:**

Depth	pH	1:5 EC	Exchangeable Cations	Exchangeable	CEC	ECEC	ESP
m		Ca	Mg	K	Na	Acidity	%
		dS/m			Cmol (+)/kg		
0 - 0.02	8.56A	0.085A	7.33B	1.94	0.4	0.01	
0.02 - 0.1	8.57A	0.083A	7.17B	1.7	0.29	0.01	
0.1 - 0.2	8.62A	8.199999E-02A	5.59B	1.44	0.26	0.01	
0.3 - 0.4	8.5A	0.196A	6.49B	2.01	0.24	0.05	
0.7 - 0.8	8.65A	0.207A	3.43B	2.09	0.29	0.18	
1.2 - 1.3	9.58A	0.347A	0.54B	3.13	0.55	3.19	
2.5 - 2.6	9.72A	0.601A	<0.1B	11.19	1.59	9.46	
3.5 - 3.6	9.36A	0.608A	<0.1B	21.12	2.15	21.05	

Depth	CaCO3	Organic C	Avail. P	Total P	Total N	Total K	Bulk Density	Particle		Size	Analysis	
								GV	CS		FS	Silt
m	%	%	mg/kg	%	%	%	Mg/m3			%		
0 - 0.02	2.4B	1.15C	<1J									
0.02 - 0.1	0.4B	0.8C	13.7J									
0.1 - 0.2	0.3B	0.48C	<1J									
0.3 - 0.4	43.7B	0.5C	31.6J									
0.7 - 0.8	35.3B	1.17C	8.6J									
1.2 - 1.3	6.9B	4.72C	8.2J									
2.5 - 2.6	12.6B	0.9C	12.9J									
3.5 - 3.6	<0.1B	0.05C	15.5J									

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**Laboratory Analyses Completed for this profile**

15A2_CA	Exchangeable bases (Ca <sup>2+</sup> ,Mg <sup>2+</sup> ,Na <sup>+</sup> ,K <sup>+</sup> ) - 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
19B1	Carbonates - manometric
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
6B3	Total organic carbon - high frequency induction furnace, infrared
7B1	Water soluble nitrate - automated colour
9B1	Bicarbonate-extractable phosphorus - manual colour