



Supplement 3 to the 3rd Edition of the Soil Data Entry Handbook

for the NSW Soil And Land Information System (SALIS)

The 4-page Soil Data Card, Version 5

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Acknowledgments

General acknowledgments are contained in the *Soil Data Entry Handbook* (Milford *et al.* 2001).

Contents

1	INTRODUCTION.....	2
1.1	PREAMBLE.....	2
1.2	STANDARDS AND REFERENCES	2
1.3	EXPLANATION OF TEXT FORMAT	2
1.4	THE 4-PAGE SOIL DATA CARD, VERSION 5	2
2	EXPLANATION OF TERMS AND ATTRIBUTES.....	3
2.1	SURFACE CONDITION.....	3
2.1.1	<i>Expected Surface Condition (Wet)</i>	3
2.1.2	<i>Expected Surface Condition (Dry)</i>	3
2.2	PROFILE ADDENDUM.....	4
2.2.1	<i>Addendum Code</i>	4
2.2.2	<i>Ref.</i>	4
2.3	LAYER ADDENDUM	9
2.3.1	<i>Layer Addendum Codes</i>	9
2.3.2	<i>Ref.</i>	9

1 INTRODUCTION

1.1 Preamble

This document describes the additional additions and changes released as part of the 4-page Soil Data Card, Version 5 as introduced in April 2007. It supplements the *Soil Data Entry Handbook*, 3rd edition (Milford *et al.* 2001). Only those attributes specific to the 4-page Soil Data Card, Version 5 are described here. This supplement should be used together with the *Handbook*, in which the rest of the fields on the 4-page Soil Data Card, Version 5 are described.

1.2 Standards and References

In keeping with Australian standards for scientific terminology in soil science, terms and definitions found in this handbook follow:

RC McDonald, RF Isbell, JG Speight, J Walker and MS Hopkins 1990, *Australian Soil and Land Survey Field Handbook* (2nd edn), Inkata Press, Melbourne, Vic., Aust.

We acknowledge permission granted by the copyright owners to use these definitions.

For ease of use, definitions of values are generally not sourced within the text. Other than Macdonald *et al.* (1990) as noted, additional sources include:

Abraham, SM and Abraham, NA 1996, *Soil Data System Site and Profile Information Handbook*, NSW Dept of Land and Water Conservation, Sydney, NSW, Aust.

Bates, RL and Jackson, JA (eds) 1984, *Dictionary of Geological Terms*, 3rd edn, Doubleday, New York, USA.

Gary, M, MacAfee, R and Wolf, CL (eds) 1972, *Glossary of Geology*, American Geological Inst., Washington DC, USA.

Moore, WG 1988, *The Penguin Dictionary of Geography*, 7th edn, Penguin, London, UK.

Morse, RJ, Atkinson, G and Craze, B 1982, *Soil Data Card Handbook*, Soil Conservation Service of NSW Technical Handbook No. 4, Sydney, NSW, Aust.

Murphy, C Fogarty, P and Ryan, P 1998, *Soil Regolith Stability Classification for State Forests in Eastern NSW*, Technical report No. 41, DLWC, NSW, Aust.

The following publication contains a complete list of referenced work (3 **References**) and describes the non-unique attributes and values on the 4-page Soil Data Card, Version 5:

Milford, HB, McGaw, AJE and Nixon, KJ (eds) 2001, *Soil Data Entry Handbook*, 3rd edn, NSW Dept of Land and Water Conservation, Sydney, NSW, Aust.

1.3 Explanation of Text Format

The text of this document is formatted into five different styles:

- ↪ Base font is used for general descriptions and explanations.
- ↪ Database terms such as **ATTRIBUTE** appear in **SMALL CAPITALS**, as do characteristics of attributes, e.g., size, type.
- ↪ Feature names are set in **BOLD CAPITALS**.
- ↪ The attributes of each feature are printed in **boldface**.
- ↪ The values of an attribute are printed in *italics* with a definition in smaller type following where necessary.

1.4 The 4-page Soil Data Card, Version 5

This card appears as leaf green text on white, 2 double-sided pages. This further enhanced version of the 4-page card incorporates a number of minor changes, including: tuning of the available values for **expected surface condition** in both **dry** and **wet** states; ability to record up to 5 **vegetation species**; entry of **profile addenda** and **layer addenda** as text fields; and retitling of several fields to more accurately describe their intent. The card also includes a range of useability features such as more advisory information on how to fill in the card and how many **VALUES** to record for each field (shown next to each field in parentheses).

2 EXPLANATION OF TERMS AND ATTRIBUTES

2.1 Surface Condition

2.1.1 Expected Surface Condition (Wet)

CHOICE, UP TO 2 VALUES

The surface condition of a soil may have a characteristic appearance when wet: this **expected wet condition** may affect the use of the soil and is diagnostic of particular soil characteristics.

Reference List of VALUES

- | | | |
|----|----------------------|--|
| 2 | <i>cracked</i> | Cracks equal to or wider than 6 mm penetrate to 0.3 m or more and at least 1 crack per square metre. Cracks may lie below a thin massive surface layer. |
| 3 | <i>self-mulched</i> | Soil surface layer is highly pedal and loose, forming a mulch. |
| 4 | <i>loose</i> | Incoherent mass of individual particles or aggregates forms the soil surface. The surface is easily disturbed by pressure of forefinger. |
| 5 | <i>soft</i> | Coherent mass of individual particles or aggregates forms the soil surface. The surface may be easily disturbed by pressure of forefinger. |
| 6 | <i>firm</i> | Coherent mass of individual particles or aggregates forms the soil surface. The surface may be disturbed or indented by moderate pressure of forefinger. |
| 8 | <i>surface crust</i> | Thin surface layer or flake, usually less than 10 mm thick, can be separated from and lifted off the soil below, and often seals the surface from penetration by moisture. |
| 10 | <i>poached</i> | Soil surface has been extensively disturbed under wet conditions by hooved animals. |
| 13 | <i>other</i> | Record the type of condition, e.g., cryptogam, in SITE FIELD NOTES . |

2.1.2 Expected Surface Condition (Dry)

CHOICE, UP TO 2 VALUES

The surface condition of a soil may have a characteristic appearance when dry: this **expected dry condition** may affect the use of the soil and is diagnostic of particular soil characteristics.

Reference List of VALUES

- | | | |
|----|------------------------|--|
| 2 | <i>cracked</i> | Cracks equal to or wider than 6 mm penetrate to 0.3 m or more and at least 1 crack per square metre. Cracks may lie below a thin massive surface layer. |
| 3 | <i>self-mulched</i> | Soil surface layer is highly pedal and loose, forming a mulch. |
| 4 | <i>loose</i> | Incoherent mass of individual particles or aggregates forms the soil surface. The surface is easily disturbed by pressure of forefinger. |
| 5 | <i>soft</i> | Coherent mass of individual particles or aggregates forms the soil surface. The surface may be easily disturbed by pressure of forefinger. |
| 6 | <i>firm</i> | Coherent mass of individual particles or aggregates forms the soil surface. The surface may be disturbed or indented by moderate pressure of forefinger. |
| 7 | <i>hard set</i> | Soil surface layer is compact, hard and apparently apedal. A surface seal may or may not occur. |
| 8 | <i>surface crust</i> | Thin surface layer or flake, usually less than 10 mm thick, can be separated from and lifted off the soil below, and often seals the surface from penetration by moisture. |
| 9 | <i>trampled</i> | Soil surface has been extensively disturbed under dry conditions by hooved animals. |
| 12 | <i>water repellent</i> | Water is not readily absorbed into the surface layer. The degree of water repellence can be recorded in SITE FIELD NOTES . |
| 13 | <i>other</i> | Record the type of condition, e.g., cryptogam, in SITE FIELD NOTES . |

2.2 Profile Addendum

A text-based entry system is provided for this field on the 4-page Version 5 data card owing to limited space.

Enter the **Addendum Code** (see Section 2.2.1 below) into the first four unshaded text boxes, and the **Ref.** (see Section 2.2.2 below) into the last two shaded text boxes. You can record up to 10 PROFILE ADDENDUM codes for each **profile**.

ATTRIBUTES and VALUES

2.2.1 Addendum Code

KEY ATTRIBUTE, 4-CHARACTER ALPHABETIC CODE, UP TO 10 VALUES PER PROFILE

These will be assigned by the SALIS Administrator after consultation with the user.

2.2.2 Ref.

2-CHARACTER NUMERICAL CODE, 1 VALUE ONLY, LEFT JUSTIFIED

This ATTRIBUTE qualifies the **Addendum Code**. The number will be assigned by the SALIS Administrator after consultation with the user.

Reference list of VALUES

AAAA - *Fungal Mat Occurrence*

AAAA 1 *none*

AAAA 2 *sporadic, <20% by area*

AAAA 3 *patchy, 20 - 70% by area*

AAAA 4 *thick, >70% by area*

AAAA - **Vegetation Communities** used as part of the Northern Floodplains Regional Planning Project

AAAA10 *Barren*

AAAA11 *Black Box/Coolibah*

AAAA12 *Bloodwood/Mulga*

AAAA13 *Black Box/Poplar Box*

AAAA14 *Brigalow*

AAAA15 *Crops and annual pastures*

AAAA16 *Coolibah/Belah*

AAAA17 *Canegrass*

AAAA18 *Chenopods*

AAAA19 *Coolibah/Other*

AAAA20 *Gidgee*

AAAA21 *Grey Mallee*

AAAA22 *Grassland*

AAAA23 *Heather Bush*

AAAA24 *Lignum*

AAAA25 *Leopardwood/Gidgee/Saltbush*

AAAA26 *Mulga*

AAAA27 *Poplar Box/Belah*

AAAA28 *Poplar Box/Coolibah*

AAAA29 *Pine/Carbeen/River Red Gum*

AAAA30 *Poplar Box/Gidgee*

- AAAA31 *Poplar Box/Ironwood*
- AAAA32 *Poplar Box/Mulga/Pine*
- AAAA33 *Poplar Box/Pine/Other*
- AAAA34 *Poplar Box/Leopardwood*
- AAAA35 *Poplar Box/Silver-Leaf Ironbark*
- AAAA36 *Red Box/Poplar Box/Mulga*
- AAAA37 *Settlement*
- AAAA38 *Spinifex*
- AAAA39 *Water*
- AAAA40 *Standing dead timber*
- AAAA41 *SWI - Supplejack/Wilga/Ironwood*
- BBBB - *Soil Observation Level*

Four levels of detail of soil description can be defined based on attributes adapted from Hackett (1983) and Bouma (1989) by McKenzie (1992).

Table 2 Soil Observation Level

	Level	No. of Variables	Time taken	Type of data	Nature of description	Interpretation
BBBB 1	A	1	1–30 mins	Soil name or brief profile description	Broad, qualitative, static and empirical	General statements of suitability for major types of land use; 2-page Soil Data Card
BBBB 2	B	50–200	20–60 mins	Profile description	Can be detailed but qualitative, static and semi-empirical	Specific statements on some limitations; 4-page Soil Data Card
BBBB 3	C	80–400	2–20 days	Profile description and laboratory data	Detailed, quantitative and static but mechanistic	Specific statements of most forms of limitations; 8-page Soil Data Card
BBBB 4	D	100–500	10–30 days	Direct measures of parameters controlling soil processes	Detailed, quantitative, dynamic and mechanistic	Dynamic and probabilistic prediction of processes controlling land use. Input for computer models; 8-page Soil Data Card plus Addenda

CCCC - *Soil Landscape Geomorphic Class*

CCCC 1 *Residual Landscapes*

Residual soil landscapes are dominated by sites where deep soils have formed from *in situ* weathering of parent materials (This has presumably taken place over long periods where the rate of soil formation has been greater than rate of erosion.) Residual soil landscapes typically have level to undulating elevated topography. Landform elements include some summit surfaces, plateaux, terrace plains, peneplains and old ground surfaces. Stream channels are usually poorly defined.

CCCC 2 *Vestigial Landscapes*

Vestigial soil landscapes are dominated by sites where shallow soils have formed from *in situ* weathering of typically resistant parent materials. Vestigial soil landscapes typically have level to undulating elevated topography. Landform elements include summit surfaces, plateaux and old ground surfaces. Rock outcrop may be common.

CCCC 3 *Karst Landscapes*

Karst soil landscapes are dominated by solutional processes, particularly on limestone and related rock types. Soil parent materials include accumulations of less soluble minerals. Drainage patterns are deranged and solution hollows are common. Landform patterns may include tors, hillslopes and dolines.

CCCC 4 *Colluvial Landscapes*

Colluvial soil landscapes are affected by mass movement. Soil parent material mostly consists of colluvial mass movement debris including scree and talus along with other landslide, mudflow and creep deposits. Colluvial soil landscapes usually include alcoves, cliffs, cliff-foot slopes, scarps, landslides, talus, some moderately inclined to precipitous hillslopes and areas of commonplace evidence of mass movement.

CCCC 5 *Erosional Landscapes*

Erosional soil landscapes have been primarily sculpted by erosive action of running water. Streams are well defined and competent to transport their sediment load. Soil depth is usually shallow (with occasional deep patches) and mode of origin is variable and complex. Soils may be either absent, derived from water washed parent materials or derived from insitu weathered bedrock. Erosional soil landscapes usually consist of steep to undulating hillslopes and may include tors, benches, and areas of rock outcrop. Evidence of mass movement is rare.

CCCC 6 *Transferral Landscapes*

Transferral soil landscapes are deep deposits of mostly eroded parent materials washed from areas directly upslope. Stream channels are often discontinuous and slopes are generally concave. Transferral landscapes include footslopes, valley flats, fans, bajadas and piedmonts.

CCCC 7 *Alluvial Landscapes*

Alluvial soil landscapes are formed by deposition along rivers and streams. Soil parent material is alluvium. Alluvial soil landscapes include floodplains and alluvial deposits. Typical landform elements include those found on meander plains; including bars, backplains, scrolls, scroll plains, flood-outs, ox-bows, levees, terraces, prior and current stream channels.

CCCC 8 *Estuarine Landscapes*

Estuarine Soil Landscapes occur where rivers and streams enter large bodies of water such as the sea or inland lakes. Channel flow is dissipated and is also modified by wave and/or tidal action. Soil materials may be influenced by saline conditions. Estuarine soil landscapes include estuaries, deltas, tidal creeks and tidal flats.

CCCC 9 *Lacustrine Landscapes*

Lacustrine soil landscapes result from infilling of lakes with sediments deposited in still water. Soil parent materials are usually fine grained, well sorted and often varved. Ground surfaces are level to gently inclined and slightly concave. Landform elements include lakes, playas, some ox-bows and some lagoons.

CCCC10 *Beach Landscapes*

Beach soil landscapes have ground surfaces and soil parent materials which have been deposited by wave action. Beach soil landscapes typically occur near sandy coast lines and near lake edges. Typical landform elements include beaches, berms, beach ridges, and some plains. Due to map scale limitations, associated foredunes and windblown soils are included.

CCCC11 *Aeolian Landscapes*

Aeolian soil landscapes have accumulated by deposition of sand-sized particles by wind action. Aeolian soil landscapes include dunefields, dunes, blow-outs, sand sheets and lunettes.

CCCC12 *Swamp Landscapes*

Swamp soil landscapes are dominated by ground surfaces and soils which are at least seasonally wet. Soil parent material includes large amounts of accumulated decayed organic matter. Watertables are frequently close to the surface. Landform elements may include swamps and some relic ox-bows, abandoned channels, lagoons and swales.

CCCC99 *Disturbed Landscapes*

Disturbed soil landscapes are dominated by ground surfaces arising from human activity. Soil parent materials have been moved, accumulated, removed or replaced (with soil or other items). Landform elements include fill-tops, embankments, cut faces, cut-over surfaces, dams, mounds and pits.

DDDD - *Prior land use*

DDDD 1 *Dense Timber*

DDDD 2 *Wooded*

DDDD 3 *Cleared Land*

DDDD 4 *Shrub/heathland*

DDDD 5 *Rehabilitated*

DDDD11 *Unlogged/uncleared*

DDDD12 *Dense Timber-regenerating*

DDDD20 *Scattered Timber*

DDDD21 *Natural woodland*

- DDDD61 *Unimproved pasture*
- DDDD62 *Irrigated non-legume pasture*
- DDDD63 *Rain-fed non-legume pasture*
- DDDD64 *Irrigated legume pasture*
- DDDD65 *Rain-fed legume pasture*
- DDDD66 *Irrigated continuous cropping*
- DDDD67 *Rain-fed continuous cropping*
- DDDD68 *Irrigated non-continuous cropping*
- DDDD69 *Rain-fed non-continuous cropping*
- DDDD90 *Unknown*
- DDDD99 *Other*
- EEEE - **Surface Soil Types** for the management of soil structure (Murphy, B and Lawrie, J. 1996)
- EEEE 1 *Class 1 – Organic surface soils*
Spongy feel, very high organic matter; surface litter or humic horizon at surface. Earthy smell.
- EEEE 2 *Class 2 – Self-mulching surface soils*
Self mulching; strongly pedal loose surface mulch; peds common <5mm.
- EEEE 3 *Class 3 – Friable surface soils*
Soils showing cementation by iron and aluminium oxides. Strongly structured with small (<10mm) peds.
- EEEE 4 *Class 4 – Loose sandy surface soils*
Very sandy soils. Loose sand. No soil structure (apedal). Pale colour. Often acidic.
- EEEE 5 *Class 5a - Fragile light-textured surface soils*
Surface crusts or seals present. Sandy loams, fine sandy loams, loamy sands.
- EEEE 6 *Class 5b - Fragile medium-textured surface soils*
Surface crusts/seals present, which may be very severe. Loams, clay loams, sandy clay loams. Weakly structured or massive; no strong stable peds.
- EEEE 7 *Class 6 - Coarse structured clay surface soils*
Coarse (>10mm), blocky peds at surface. Very hard and tough when dry.
- EEEE 8 *Class 7 - Sodic surface soils*
Thick, continuous surface crust; sand grains may be visible on surface. Surface soils coarsely structured (>20mm) and very hard when dry.
- EEEE 9 *Class 2/7 - Self-mulching and sodic surface soils*
- EEEE10 *Class 4/7 - Loose sandy; sodic surface soils*
- EEEE11 *Class 5a/7 - Fragile light-textured; sodic surface soils*
- EEEE12 *Class 6/7 - Coarse structured clay; sodic surface soils*
- EEEE13 *Class 5b/7 - Fragile medium-textured; sodic surface soils*
- EEEE14 *Class 7/2 - Sodic surface soils; self-mulching surface soils*
- EEEE15 *Class 6/2 - Coarse structured clay surface; self-mulching soils*
- ERDA - **Estimated rooting depth for agriculture** used as part of the Border Rivers-Gwydir (BRG) 5/10 project
- ERDA01 *< 0.25 m*
- ERDA02 *0.25 - < 0.5 m*
- ERDA03 *0.5 - < 1 m*
- ERDA04 *1 - <1.5 m*
- ERDA05 *1.5 - < 5 m*

- ERDA06 > 5 m
- ELSC - **Estimated Land and Soil Capability Class** used as part of the Border Rivers-Gwydir (BRG) 5/10 project
- ELSC01 *Class 1*
- ELSC02 *Class 2*
- ELSC03 *Class 3*
- ELSC04 *Class 4*
- ELSC05 *Class 5*
- ELSC06 *Class 6*
- ELSC07 *Class 7*
- ELSC08 *Class 8*
- ELSC99 *Class undetermined*
- FFFA - **State Forests**
- Contact the SALIS team for the details of this list.
- GGGG - **Acid Sulfate Soil additional descriptive code** used as part of the NRAC Acid Sulfate Soil Risk Mapping Program
- GGGG 1 *(p) Pleistocene*
- GGGG 2 *(s) Acidic Scald*
- III - **Flooding Category** from the Northern Floodplains Regional Planning Project. The amount of run-on and how long the water sits around
- III 1 *Not flooded*
- III 2 *Rarely flooded*
- III 3 *Local run-on*
- III 4 *Subject to intensive floodwater passage*
- III 5 *Subject to passive floodwater passage*
- III 6 *Subject to inundation for extensive periods*
- III 7 *Isolated by floodwaters*
- III 8 *Not flooded; subject to intense floodwater passage*
- III 9 *Local run-on; subject to intense floodwater passage*
- III10 *Passive floodwater passage and inundation for extended periods*
- III11 *Intense floodwater passage & inundation for extended periods*
- III12 *subject to intense floodwater passage; not flooded*
- III13 *Not flooded; isolated by floodwaters*
- III14 *Subject to inundation for extended periods; local run-on*
- III15 *Intense and passive floodwater passage and inundated for periods*
- III16 *Rarely flooded; isolated by floodwaters*
- III17 *Subject to intense and passive floodwater passage*
- III18 *Run-on; passive floodwater passage and inundated for periods*
- JJJJ - **NFRP Soil Map Unit** – soil capability map unit descriptions used by the Northern Floodplains Regional Project
- JJJJ 1 *Soil Map Unit 1*
-
- JJJJ45 *Soil Map Unit 45*
- KKKK - **Regolith Classification** based on Murphy et al. (1998)
- KKKK 1 *R1*

- KKKK 2 *R2*
- KKKK 3 *R3*
- KKKK 4 *R4*
- HHHH - Ground cover** categories used as part of the Northern Floodplains Regional Planning Project
- HHHH 1 *Unidentified cryptograms*
- HHHH 2 *Leaf litter*
- HHHH 3 *Unidentified grass species*
- HHHH 4 *Immature forbs*
- HHHH 5 *Fallen dead timber*
- ROOT - Soil condition for root growth** used as part of the Border Rivers-Gwydir (BRG) 5/10 project
- ROOT01 *Good rooting conditions*
- ROOT02 *Moderate rooting conditions*
- ROOT03 *Poor rooting conditions*
- SOME - Surface organic matter estimate** used as part of the Border Rivers-Gwydir (BRG) 5/10 project
- SOME01 *As unused state*
- SOME02 *Slightly to moderately reduced*
- SOME03 *Less than half*
- SOME04 *Less than one quarter*
- SOME05 *Virtually or totally absent*
- WINE - Wind exposure** used as part of the Border Rivers-Gwydir (BRG) 5/10 project
- WINE01 *Low exposure*
- WINE02 *Moderate exposure*
- WINE03 *High exposure*

Contact the SALIS team for any further updates to this list.

2.3 Layer Addendum

A LAYER ADDENDUM code is provided for regular recording of characteristics not catered elsewhere on the soil data card. A particular user of the System may request this from time to time for a specific purpose or for such characteristics as are not seen to be required for use by the general community. Where necessary, LAYER FIELD NOTES can be used to record other attributes or values and more detailed descriptions.

Enter the **Addendum Code** (see Section 2.3.1 below) into the first four unshaded text boxes, and the **Ref.** (see Section 2.3.2 below) into the last two shaded text boxes. You can record up to 4 LAYER ADDENDUM codes for each **layer**.

2.3.1 Layer Addendum Codes

KEY ATTRIBUTE, 4-CHARACTER ALPHABETIC CODE, UP TO 4 VALUES PER LAYER, LEFT JUSTIFIED

This field is intended to be used to record details about soil layers that are not catered for in other parts of the Soil Data Card. These will be assigned by SALIS staff after consultation with the user.

2.3.2 Ref.

2-CHARACTER NUMERIC CODE, 1 VALUE PER LAYER ADDENDUM CODE, RIGHT JUSTIFIED

This ATTRIBUTE qualifies the **Addendum Code**.

Reference List of VALUES

QQQQ - **Watertable**

QQQQ 1 *none*

A watertable is not present.

QQQQ 2 *seasonal*

A watertable is present only seasonally.

QQQQ 3 *permanent*

A watertable is present at all times.

QQQQ 4 *perched*

A watertable is held above the main body of ground water by an impermeable layer or stratum, usually clay, and is separated from the main body of ground water by an unsaturated zone. It may be seasonal or permanent.

RRRR - Ped Porosity

RRRR 1 *porous*

RRRR 2 *dense*

SSSS - Root Distribution

SSSS 1 *in-ped*

Most roots pass through the peds.

SSSS 2 *ex-ped*

Most roots follow ped interfaces.

SSSS 3 *in-ped & ex-ped*

TTTT - Maximum size of macropores

TTTT 3 *0.3 mm*

TTTT 5 *0.5 mm*

TTTT 10 *1.0 mm*

TTTT 20 *2.0 mm*

TTTT 30 *3.0 mm*

TTTT 40 *4.0 mm*

TTTT 50 *5.0 mm*

TTTT 60 *6.0 mm*

TTTT 70 *7.0 mm*

TTTT 80 *8.0 mm*

TTTT 90 *9.0 mm*

TTTT 99 *9.9 mm*

UUUU - Macropore Abundance

UUUU 1 *0.1%*

UUUU 2 *0.2%*

UUUU 3 *0.3%*

UUUU 5 *0.5%*

UUUU 10 *1.0%*

UUUU 15 *1.5%*

UUUU 20 *2.0%*

UUUU 25 *2.5%*

UUUU 30 *3.0%*

UUUU 35 *3.5%*

UUUU 40 *4.0%*

- UUUU 45 4.5%
- UUUU 50 5.0%
- UUUU 55 5.5%
- UUUU 60 6.0%
- UUUU 65 6.5%
- UUUU 70 7.0%
- UUUU 75 7.5%
- UUUU 80 8.0%
- UUUU 85 8.5%
- UUUU 90 9.0%
- UUUU 95 9.5%

VVV - Macropore Distribution (Hodgson 1976)

- VVV 1 *TYPE A*
- VVV 2 *TYPE B*
- VVV 3 *TYPE C*
- VVV 4 *TYPE D*

WWWW - Layer Permeability

- WWWW 1 *Rapid*
Water penetration occurs at a rate of >130 mm/h.
- WWWW 2 *Mod. to rapid*
Water penetration occurs at a rate of 60 - 130 mm/h.
- WWWW 3 *Moderate*
Water penetration occurs at a rate of 20 - 60 mm/h.
- WWWW 4 *Slow to moderate*
Water penetration occurs at a rate of 5 - 20 mm/h.
- WWWW 5 *slow*
Water penetration occurs at a rate of 1 - 5 mm/h.
- WWWW 6 *very slow*
Water penetration occurs at a rate of <1 mm/h.

XXXX - Vesicles

- XXXX 1 *not vesicular*
- XXXX 2 *very slightly vesicular*
- XXXX 3 *slightly vesicular*
- XXXX 4 *moderately vesicular*
- XXXX 5 *very vesicular*

YYYY - Dent's Classification for Acid Sulphate Soils (Dent 1986)

Horizons of unripe saline clay soils

- YYYY 1 *Gr*
Practically unripe or half ripe; permanently reduced and accumulating pyrite.
- YYYY 2 *Gro*
Half ripe; partly oxidised; iron pipes and ped coatings.

YYYY 3	<i>Go</i>	Nearly ripe; oxidised; mottles; nodules, pipes and coatings of iron or iron oxide, not potentially acid.
YYYY 4	<i>Gj</i>	Severely acid; black, dark grey or pinkish brown, usually with pale yellow jarosite mottles; practically unripe or half ripe; reserve of pyrite present.
YYYY 5	<i>G</i>	Undifferentiated, unripe surface layer.
Horizons developing after drainage		
YYYY 6	<i>GBj</i>	Severely acid; grey with pale yellow jarosite mottles; half ripe or nearly ripe; reserve of pyrite present.
YYYY 7	<i>Bj</i>	Severely acid; strongly mottles grey with reddish iron oxide and yellow jarosite mottles; ripe.
YYYY 8	<i>Bg</i>	Not severely acid; strongly mottled grey with reddish iron oxide mottles and nodules; ripe.
YYYY 9	<i>Hj</i>	Severely acid peat.
YYYY 10	<i>A</i>	Surface mineral horizon distinguished by a concentration of organic matter, not severely acid.
Horizons developing under prior conditions		
YYYY x0	<i>xA</i>	As for <i>A</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x1	<i>xGr</i>	As for <i>Gr</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x2	<i>xGro</i>	As for <i>Gro</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x3	<i>xGo</i>	As for <i>Go</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x4	<i>xGj</i>	As for <i>Gj</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x5	<i>xG</i>	As for <i>G</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x6	<i>xGBj</i>	As for <i>GBj</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x7	<i>xBj</i>	As for <i>Bj</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x8	<i>xBg</i>	As for <i>Bg</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
YYYY x9	<i>xHj</i>	As for <i>Hj</i> above but "x" represents prior stage(s) of acid sulphate horizon development.
Dry Strength (Crushing Characteristics)		
ZZZZ 1	<i>loose</i>	

No force required. Separate particles such as loose sands.

ZZZZ 2 *very weak force*

Very small or almost nil force is required.

ZZZZ 3 *moderately weak force*

Small but significant force is required.

ZZZZ 4 *moderately firm force*

Moderate to firm force is required.

ZZZZ 5 *very firm force*

Strong force but within the power of thumb and forefinger.

ZZZZ 6 *moderately strong force*

The force required is beyond the capability of the thumb and forefinger.

Contact the SALIS team for any updates to this list.