

This Technical Data Sheet describes the *typical average properties* of the specified soil.

It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Advise should be sought from soil and landuse experts before making landuse decisions on individual farms and paddocks. The characteristics of the soil at a specific location may differ in some details from those described here.

No warranties are expressed or implied unless stated.

## Soil name: **Mclvor**

### Overview

Mclvor soils occupy about 950 ha on hill country in the Blackmount district of western Southland. They are formed in a thin layer of loess overlying limestone bedrock, or gravelly limestone colluvium on steeper slopes. Mclvor soils are well drained, with a shallow rooting depth and low water-holding capacity that is limited by the gravelliness and bedrock that occurs within 45cm depth. The Mclvor soils are the same as the Kauana soils, and should be correlated as Kauana soils. They are used for pastoral grazing with sheep and beef cattle. Climate is cool temperate with regular rainfall.

### Soil classification

#### **NZ Soil Classification (NZSC):**

Typic Rendzic Melanic; angular stony, limestone; clayey

#### **Previous NZ Genetic Classification:**

Weak to moderately gleyed yellow-brown earth.

#### **Classification explanation**

The NZSC of Mclvor soils has been reclassified because the soil properties are more similar to Melanic than to Brown soils. This is reflected in the dark coloured topsoils and moderate to strong structure throughout the profile. Mclvor soils are naturally fertile, with high base saturation and pH values of >5.8 throughout the profile. They typically have limestone bedrock or gravelly colluvium within 45cm depth, with clayey textures.

### Soil phases and variants

Identified units in the Mclvor soils are:

- Mclvor steep shallow (MiS3): has gravel within 45cm depth; occurs on slopes >25°
- Mclvor hilly shallow (MiH3): has gravel within 45cm depth; occurs on slopes of 15–25°
- Mclvor undulating shallow (MiU3): has gravel within 45cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Mclvor steep shallow (MiS3). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating, e.g., Mclvor undulating shallow (MiU3).

### Associated soils

Some soils that commonly occur in association with Mclvor soils are:

- Te Mara: moderately deep to deep, imperfectly drained soil formed into mixed loess and fine colluvium from limestone.
- Mangapiri: deep, poorly drained clayey soil formed into fine colluvium from siltstone and mudstone

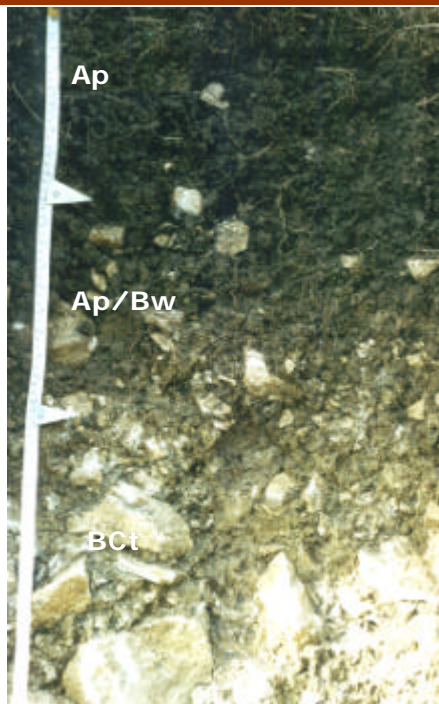
## Similar soils

Some soils that have similar properties to Mclvor soils are:

- Kauana: shallow soil onto limestone in the Monowai area. The Mclvor series should be correlated into the Kauana series
- Mandeville: shallow soil forming onto tuffaceous sandstone bedrock
- Kaihiku: shallow soil forming into gravelly tuffaceous sandstone colluvium

## Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Mclvor profile	Horizon	Depth (cm)	Description
	Ap	0–22	Brownish black slightly gravelly silty clay; weak soil strength; strongly developed fine to medium blocky structure; gravels angular and slightly weathered; abundant roots
	Ap/Bw	22–47	Greyish yellow-brown very gravelly silty clay; many worm casts; weak soil strength; moderately developed medium to coarse blocky structure; gravels angular and slightly weathered; abundant roots
	BCt	47–90	Dull yellowish brown extremely gravelly silty clay; few clay coats lining pores and gravels; massive structure; gravels angular and slightly weathered; common roots

## Key profile features

Mclvor soils have dark coloured topsoils 20–25cm deep with a moderate to strongly developed structure. Subsoil structure is also moderately developed. Limestone bedrock or extremely gravelly colluvium occurs at shallow to moderately deep depths.

## Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–22	—	<i>Moderate</i>	Silty clay	Slightly gravelly
Ap/Bw	22–47	—	<i>Moderate</i>	Silty clay	Very gravelly
BCt	47–90	—	<i>Moderate</i>	Silty clay	Extremely gravelly

**Profile drainage:** Well

**Plant readily available water:** *Low*

**Potential rooting depth:** Shallow

**Rooting restriction:** Subsoil gravelliness and/or bedrock

## Key physical properties

Mclvor soils have a shallow rooting depth, restricted by the gravelliness and bedrock in the subsoil, and low plant available water. These soils are well drained, with good aeration and permeability throughout the soil. Textures are typically heavy silt loam to silty clay, but does vary according to the proportion of loess in the soil. The topsoil clay content is 35–45%. The soils are gravelly throughout, and typically have at least 35% gravel and/or bedrock within 45cm depth.

## Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–22	High	Moderate	Very high	Very high	Very high	Moderate	Very high	Low
Ap/Bw	22–47	Very high	Moderate	High	Very high	Very high	Moderate	Moderate	Very low
BCt	47–90	Very high	Low	High	Very high	Very high	Moderate	Low	Very low

## Key chemical properties

Topsoil organic matter levels are variable (7–14%); P-retention values 30–40% and pH high (6–7%). Cation exchange and base saturation are very high due to the limestone influence. Available calcium, magnesium and potassium values are all high. Reserve phosphorus values are low and micronutrient levels generally adequate.

## Vulnerability to environmental degradation

**Note:** the vulnerability ratings given in the table below are generalised and should not be taken as absolutes for this soil type in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time. Specialist advice should be sought before making management decisions that may have environmental impacts. Where vulnerability ratings of Moderate to Very severe are indicated, advice may be sought from Environment Southland or a farm management consultant.

Vulnerability factor	Rating	Vulnerability compared to other Southland soils
<b>Structural compaction</b>	slight	These soils have a slight vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage and high clay content.
<b>Nutrient leaching</b>	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage and permeability, and low water-holding capacity.
<b>Topsoil erodibility by water</b>	minimal	Due to the high organic matter and clay content, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	moderate	Vulnerability to long-term decline in soil organic matter levels is partly dependent on soil properties and highly dependent on management practices (e.g., crop residue management and cultivation practices).
<b>Waterlogging</b>	slight	These soils have a slight vulnerability to waterlogging during wet periods. This rating reflects the good drainage and permeability. The hilly and steep phases will have nil vulnerability.

## General landuse versatility ratings for Mclvor soils

**Note:** The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. These ratings differ from those used in the past in that sustainability factors are incorporated in the classification.

Refer to the Topoclimate district soil map or property soil map to determine which of the soil symbols listed below are applicable, then check the versatility ratings for that symbol in the appropriate table.

### MiS3 (Mclvor steep shallow)

### MiH3 (Mclvor hilly shallow)

Versatility evaluation for soil MiS3, MiH3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Hilly and steep slopes
Arable	Unsuitable	Hilly and steep slopes
Intensive pasture	Limited	Hilly and steep slopes; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

### MiS2 (Mclvor steep moderately deep)

Versatility evaluation for soil MiS2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Steep slopes
Arable	Unsuitable	Steep slopes
Intensive pasture	Limited	Vulnerability to leaching to groundwater; steep slopes
Forestry	Limited	Steep slopes; restricted rooting depth.

**MiU3 (Mclvor undulating shallow)**

Versatility evaluation for soil MiU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Arable	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Intensive pasture	Limited	Vulnerability to leaching to groundwater; restricted rooting depth
Forestry	Unsuitable	Shallow rock depth

**Management practices that may improve soil versatility**

- Management of nutrient applications that minimise leaching losses

**Soil profiles available for Mclvor soils**

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
MiS3	Mt2	7	✓	✓	✓	✓

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