CANBERRA ENVIRONMENT AND SOILS SHORT COURSE: SOIL ASSESSMENT, GEOLOGY, AND METALS BIOAVAILABILITY

University of Canberra I 29-30 March 2021

Introduction

This is a two-day course for all those who work with soils in and around the Canberra area and specifically those who work in the field of contaminated lands or soil nutrition. We'll cover Canberra geology and how to identify rock types, the relationship of soils to geology and vegetation, metals in soils, their bioavailability, and how they relate to plants and geology. The course will provide attendees with the skills to identify key Canberra rocks, know likely mineral assemblages in these rocks, and how these minerals affect metal concentrations in soils. Basic weathering and soil-forming processes will be outlined, as well as soil survey techniques, including soil description and classification. It will show attendees how to understand the relationships between soils, landscapes, the geology and vegetation types, as well as soil-groundwater interactions.

Day one of the course will be presented as a combination of lectures and practical sessions on rocks, regolith, soils and groundwater processes. Day two will include visits to illustrative field sites demonstrating the concepts covered in the lectures and practical sessions, as well as highlighting some of the soil-related environmental issues in Canberra.

The course is fully catered for morning and afternoon tea and lunches.

Objectives

- Understand how to undertake basic soil assessment.
- Understand how Canberra soils are connected to the geology, with a particular focus on metals.
- Understand how to interpret soils within landscapes.
- Understand how to assess the hazards presented by potentially toxic metals in Canberra soils.

Lecturers

Ken McQueen - Geologist and geochemist (Ken.McQueen@canberra.edu.au)
Peter Fogarty - Consultant Soil Scientist, Certified Professional Soil Scientist

Day one (29 March 2021) Lectures and Practical's

Time	Event
0830-900	***Welcome mixer - meet and greet***
0900-0945	Introduction to the course - lecturer background, facilities locations, course plan
	Rock block
0945-1030	Canberra geology - the rock story; rock types, formation types, major structures and their impact
1030- 1100	***Break***
1100- 1145	Metals and how they relate to geology
1145- 1230	Metals bioavailability
1230- 1330	***Lunchbreak***
1330- 1415	Practical session - example rock types
	Soils block
1415- 1500	Canberra geology - the groundwater story - vadose zone hydrogeology, deeper groundwater, water quality, flow, and flow assessment
1500- 1545	Introduction to soils; Soil types and locations, vegetation types on these soils, and how these relate to the geology
1545- 1600	***Afternoon teabreak***
1600- 1645	Soil survey 101 - A, B, C horizons, soil texture analysis, structure assessment, soil classification, how to interpret these for contaminated lands
1645 - 1730	Practical Session - soil types which will be seen during the field

Day two (30 March 2021) - Field Day

Time	Event
0830-900	***Site visit***
	Geology
0900-0945 0945- 1030	Gosson Hill illustrating rock types, weathering profile, soils, the gossan and geochemical dispersion.
1030- 1100	***Break***
1100-1120 1100- 1230	Gosson Hill illustrating rock types, weathering profile, soils, the gossan and geochemical dispersion.
1230- 1330	***Lunchbreak***
	Soils
1330-1355 1355- 1415	Gosson Hill illustrating rock types, weathering profile, soils, the gossan and geochemical dispersion.
1415- 1430	***Afternoon teabreak***
1500- 1600	The bigger picture - Canberra soils discussion and forum
1600- 1630	Close of short course