NACOE
NATIONAL ASSET CENTRE OF EXCELLENCE

PROJECT TITLE:
Dispersive and Slaking Soils Management (O21)

PROJECT LEADERS:
Brook Hall (ARRB) and Louise Dutton (TMR)

PROJECT STATUS:
In Progress (continuing into 2021/22)

AN INITIATIVE BY:
The Queensland Department of Transport and Main Roads and the Australian Road Research Board

PROJECT PURPOSE:

This project aims to investigate current industry best practice management measures for dispersive and slaking soils and to develop and integrate management measures, including testing and treatment, into TMR's specification requirements.

BACKGROUND:

Dispersive soils (commonly referred to as sodic soils) occur across over 45 % of Queensland's landscape soils. These soils are highly vulnerable to erosion when exposed to water and can cause extensive sub-surface damage if they are not identified and treated. Slaking soils also occur throughout the Queensland landscape and where exposed in cuttings, can result in extensive soil loss, especially when they occur with dispersive soils.
Exposure of these soils as part of transport infrastructure construction can cause significant risks to asset integrity, maintenance requirements and environmental impacts if they are not managed appropriately.

APPROACH/METHODOLOGY:

Year One Outputs (2020/2021)

- Literature review and analysis of current practices
- Stakeholder workshop to identify opportunities for improving processes for identification and management of dispersive and slaking soils in Queensland
- A final report with recommended amendments to TMR's guidance and specifications will be finalised by June 2021
- The final report will be supported by a webinar to summarise the research approach, findings and recommendations.

Year Two Outputs (2021/2022)

- Year Two of the project will develop and deliver additional webinars, guidance materials and workshops with TMR staff and its contractors to support the implementation of the recommendations from Year One.

KEY PROJECT OUTCOMES:

To date, the project has resulted in:

- Research and stakeholder engagement verified that soil testing is a low-cost measure for early detection of soil risks which facilitates the ability to mitigate against major cost and environmental impacts through road planning and design.
- The project recommended amendments to TMR's operating guidance and specifications to ensure that soils are tested and risks are managed as business as usual throughout the planning, delivery and maintenance of road projects.
- The project has created a greater awareness and understanding of soil management testing, issues and treatments and facilitated engagement across TMR's business units and with industry.

NEXT STEPS:

A knowledge dissemination program, including webinars, guidance materials and workshops, will be developed to help TMR and its contractors implement best practice management practices.

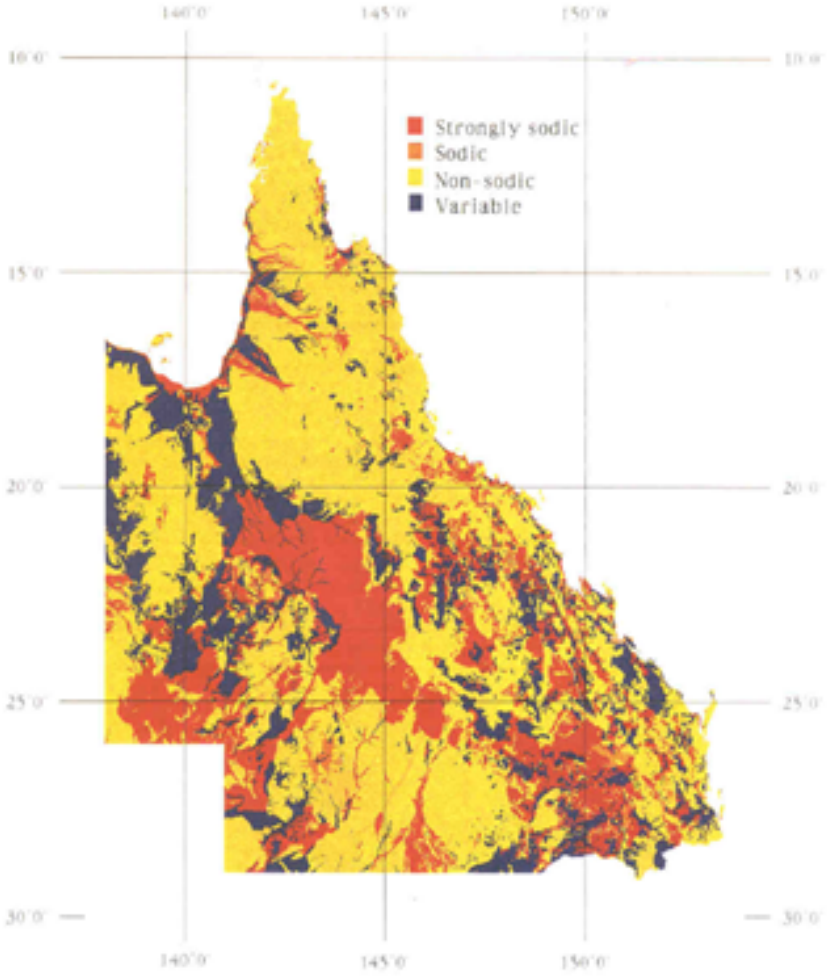
The implementation of project outcomes will help to -

- Improve the consistency and quality of guidance
- Improve infrastructure design in problem soils
- Provide clarity to contractors on management requirements, avoid remedial works, reduce asset failures and minimise environmental impact.

IMAGES:

Dispersive soils (commonly referred to as sodic soils) occur across over 45% of Queensland's landscape soils.

Figure 1.1: Distribution of Sodic Soils in Queensland – *Source: Raine & Loch (2003)*



IMAGES:

Examples of dispersive and slaking soils are presented in the following images:

Figure 1.2: Examples of erosion due to dispersive soils

Figure 2.4: Example of 'outlet initiated' tunnel erosion – *Source: Hardie et al. (2009)*

Figure 2.5: Example of table drain constructed in dispersive soils – *Source: Hardie et al. (2009)*

WEBINARS:

- Project webinar on the recommended management processes for dispersive soils is planned for June 2021.
- Summary of TMR and contractor requirements webinar (early 2022 – date TBC)
- Three knowledge dissemination workshops on specific management. requirements for TMR staff and contractors (early to mid-2022 – date TBC).

REPORTS & PUBLICATIONS:

TMR Specifications:

- MRTS04 General Earthworks and annexure MRTS4.1 (2020)
- MRTS16 Landscape and Revegetation Works (2017)
- MRTS51 Environmental Management (2020)
- MRTS52 Erosion and Sediment Control (2018)

TMR guidance and standards:

- Soil Management Manual (pending release)
- Geotechnical Design Standard – Minimum Requirements (2020)