

## 10c Geotechnical hazards

### Explanatory outline

Section 10c outlines assessment criteria relating to the management of geotechnical hazards. The following matters are covered:

- requirements for preparation of geotechnical reports
- development on steep slopes, and potential areas of land slip
- areas subject to fill
- land affected by salinity
- construction works

## 10c Geotechnical hazards

### 10c.1 Application of this section

This section applies to development described in Column 1 when carried out on land described in Column 2.

Column 1:	Type of development	Column 2:	Applicable land
Any development that requires development consent.		Any land.	
Does not apply to proposals for which a complying development certificate is sought under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.			

### 10c.2 Relevant planning instruments & legislation

The *Upper Hunter Local Environmental Plan (LEP) 2013* is relevant to development to which this section applies. Specific LEP provisions apply to earthworks, groundwater vulnerability, riparian land, and land affected by salinity.

Further planning instruments and legislation may also be relevant. In the event of any inconsistency, the *Upper Hunter Local Environmental Plan 2013* will prevail over requirements or criteria contained in this section.

### 10c.3 Definitions

There may be words used in this Part that are defined in the *Environmental Planning and Assessment Act, 1979*, as amended, or within *Upper Hunter Local Environmental Plan 2013*, as amended. The **Dictionary** to this DCP provides additional definitions that are relevant to this Part.

### 10c.4 Objectives

The objectives of this section are to:

1. avoid development on land subject to geotechnical hazards where possible
2. ensure potential geotechnical hazards and salinity processes affecting land are appropriately considered in development approvals



## 10c Geotechnical hazards

3. avoid adverse impacts of development on salinity, and minimise the impacts of salinity on development and use of land
4. identify requirements for geotechnical studies and reports
5. ensure subdivision and development in, and around the Scone urban area considers the applicable hydrogeological landscape (HGL) and measures to be applied in planning, development design and construction, and management of land with salinity.

### 10c.5 Supporting plans & documentation

Development applications that are subject to this section should be supported by the following plans and documentation.

Item	When required	Plans or information to be provided
<b>A. General requirements</b>	All applications	Refer to Part 2 <b>Preparing &amp; lodging a development application.</b>
<b>B. Geotechnical hazard assessment</b>	<p>Applications that involve:</p> <ol style="list-style-type: none"> <li>1. land potentially subject to instability, slip, erosion, or other mass movement; or</li> <li>2. steep land (slopes generally 1 in 3 or greater); or</li> <li>3. significant land surface disturbance; or</li> <li>4. large-scale industrial or commercial development; or</li> <li>5. excavation in, above or adjacent to rail corridors, as defined in Clause 86 of <i>SEPP (infrastructure) 2007</i>, or where the distance between the toe of the fill, or retaining structure, and the rail corridor boundary is less than twice the height of the fill/retaining structure; or</li> <li>6. excavation in or adjacent to the Scone Bypass corridor, as defined in <b>part 13f.</b></li> </ol>	<p>A Geotechnical report, undertaken by a suitably qualified and experienced person*, that contains, at a minimum:</p> <ul style="list-style-type: none"> <li>• consideration of all relevant matters relating to the development of the land, as outlined in this part of the DCP, and in other appropriate parts, including on and off-site impacts arising from development</li> <li>• recommendations to be applied in the approval and construction of the development.</li> </ul> <p><b>Where a proposal is subject to (5) or (6) in the 'When Required' column</b>, then the requirements of Department of Planning, 2008. <i>Development Near Rail Corridors and Busy Roads – Interim Guideline</i> must be followed.</p> <p>Where a <b>subdivision</b> proposal is on land identified as being potentially subject to landslip, the applicant shall engage a suitably qualified and experienced person* to prepare a report on the viability of subdividing the land and if viable, provide recommendations as to the siting and the type of buildings and waste water treatment systems which could be permitted on the subject land.</p> <p>* The Geotechnical assessment should be undertaken by a suitably qualified geotechnical engineer or engineering geologist who is: Listed on the National Professional Engineers Register Level 3 (NPER-3) or a current member of Fellow of the Australian Institute of Geoscientists, and has a minimum of 5 years working</p>

## 10c Geotechnical hazards

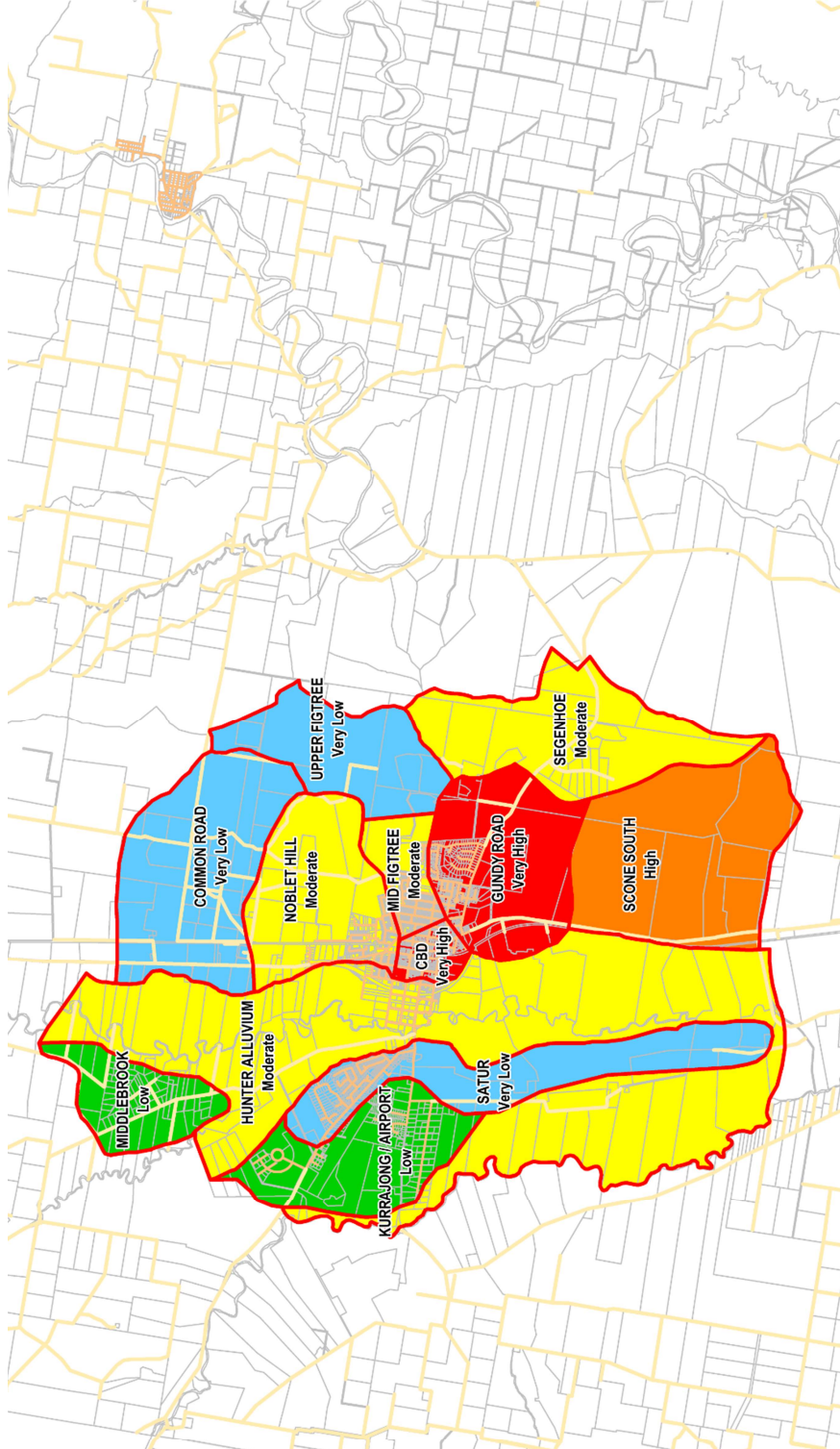
Item	When required	Plans or information to be provided
		<p>experience as a geotechnical engineer or engineering geologist advising on building and excavation works and associated geotechnical issues.</p>
<p><b>C. Salinity investigation report</b></p>	<p>All applications for subdivision of land, or Applications that involve:</p> <ul style="list-style-type: none"> <li>• land subject to soil salinity; and/or</li> <li>• land that is adjacent to other land known to be subject to soil salinity; and/or</li> <li>• land shown on <b>Map 1: Overall Salinity Hazard, Scone</b> or otherwise identified as Very High/High to Moderate salinity hazard.</li> </ul>	<p>Investigations and sampling for salinity should be conducted in accordance with the requirements of the Office of Environment and Heritage booklet '<i>Site Investigations for Urban Salinity</i>' and should be undertaken by a suitably qualified and experienced person.</p> <p>Where salinity processes on, or affected by the land, are confirmed by the above investigations and sampling, a Salinity Investigation report shall identify:</p> <ul style="list-style-type: none"> <li>• planning, development and management measures required to avoid and minimise adverse impacts from the development of the land</li> <li>• measures to be taken to mitigate impacts on the development and surrounding land use (including requirements for earthworks, construction standards and protection of groundwater recharge areas).</li> </ul> <p>Where the application is for the subdivision of land, additional requirements identified in <b>Part 3 Subdivision</b> may apply.</p>
<p><b>D. Salinity Management Plan</b></p>	<p>In areas of salinity affectation, including land shown on <b>Map 1: Overall Salinity Hazard, Scone</b> or otherwise identified as Very High/High to Moderate salinity hazard.</p> <p>This may be required at the time of the development application, or may be required as a condition of development consent.</p>	<p>A Salinity Management Plan is to be prepared to show that the site is suitable for development, and to guide earthworks and construction of the subdivision (or other relevant development), and should address the following considerations:</p> <ul style="list-style-type: none"> <li>• minimising groundwater recharge</li> <li>• excavation and soil disturbance</li> <li>• construction standards for roads, infrastructure and buildings</li> <li>• provision of stormwater management facilities and sub-surface drainage</li> <li>• location and scale of landscaping and vegetation planting (based on appropriate modelling) and suitable local plant species (local provenance seed stock).</li> <li>• a Salinity Monitoring Plan to monitor both on-site and off-site impacts.</li> </ul>

# 10c Geotechnical hazards

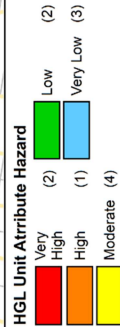
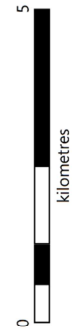


**Map 1: Overall Salinity Hazard, Score**

Source: Hydrogeological Landscapes (HGL) mapping, NSW Department of Planning, Industry & Environment (Nicholson 2021)



Upper Hunter  
Development Control Plan 2022  
HGL Unit Attribute Hazard



Filename: UHSC\_DCP\_HGLUnitAttributeHazard\_Mar2022  
Date: 2/3/2022

## 10c Geotechnical hazards

### 10c.6 Assessment criteria

A performance-based approach will be adopted in the assessment of development applications. Applications will be assessed according to the extent to which the outcomes specified in the left-hand column of the following table will be satisfied or achieved by the design, construction or operation of the proposal.

The design guidelines specified in the right-hand column indicate design and best practice solutions by which the required outcomes can be met. They do not preclude other solutions that may be suitable under particular local circumstances. All proposals will be considered on merit.

Outcomes to be achieved	Design guidelines
<p><b>A. Soil salinity</b></p> <ul style="list-style-type: none"> <li>■ Development on saline soils is avoided.</li> <li>■ Use of land takes into account the applicable hydrogeological landscape (HGL) identified in <i>Urban Salinity Development Management Guidelines (Scone NSW Pilot) (DPIE 2021)</i> and applies appropriate planning, development and management measures for the land for that landscape as identified in the above document.</li> <li>■ Where a development site is subject to salinity, measures are taken to protect buildings and infrastructure from corrosion associated with saline soils.</li> <li>■ Development does not significantly increase the salt load in existing watercourses and soils within the catchment.</li> <li>■ Prevent degradation of the existing soil and groundwater environment, including minimising erosion and sediment loss and water pollution due to siltation and sedimentation.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify hazard areas and processes on the site.</li> <li>• Reduce water input and maintain natural water balance that limits groundwater rise and through flow.</li> <li>• Limit development changes from pre-existing hydrological conditions and processes, including minimising cut and fill and changes to water infiltration and drainage.</li> <li>• Maintain good drainage and reduce waterlogging.</li> <li>• Retain or increase vegetation in strategic areas.</li> <li>• Implement appropriate building controls and engineering responses - concrete foundations, brickwork/masonry products, roads, above ground/ underground infrastructure must be constructed to a standard that appropriately responds to the level of saline conditions affecting the land.</li> <li>• Implement suitable landscaping and vegetation planting that is appropriate for the soil and groundwater characteristics.</li> </ul>
<p><b>B. Highly erodible soils</b></p> <ul style="list-style-type: none"> <li>■ Where a development site is subject to highly erodible soil, the development takes account of the limitations of the soil, and erosion is minimised</li> </ul>	<ul style="list-style-type: none"> <li>• Implement any measures recommended in a geotechnical report to reduce or minimise the hazard or erosion</li> </ul>
<p><b>C. Land slip &amp; unstable land</b></p> <ul style="list-style-type: none"> <li>■ Subdivision and development of land subject to land slip or that is otherwise unstable is avoided</li> </ul>	<ul style="list-style-type: none"> <li>• Applicants must demonstrate that more suitable alternative development sites are not feasible.</li> <li>• Measures recommended in a geotechnical report to reduce or minimise hazard are to be implemented</li> </ul>
<p><b>D. Steep slopes</b></p>	<ul style="list-style-type: none"> <li>• The slope of land proposed to be developed is to be surveyed and determined by a registered surveyor.</li> </ul>

## 10c Geotechnical hazards

### Outcomes to be achieved

- Subdivision and development of land on steep slopes is avoided.
- Hazards associated with the development of steep slopes is adequately assessed, and measures are taken to reduce or minimise hazards to an acceptable level.

### Design guidelines

- Measures recommended in a geotechnical report to reduce or minimise hazard are to be implemented

### E. Construction works

- Works including deep earthworks, and construction on filled land require a geotechnical assessment to identify whether the subject site is suitable for its intended use as part of the development application.

### 10c.7 Supplementary guidance

The following documents or reference materials provide further advice or information that is relevant to this section.

- Australian Geomechanics Society, 2007, *Guidelines for Landslide Susceptibility, Hazard and Risk Zoning for Land Use Planning*, <http://australiangeomechanics.org/resources/downloads/>
- Local Government Salinity Initiative Resource Materials: <https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/salinity/type-of-salinity-and-their-prevention>
  - Local Government Salinity Initiative - Introduction to Urban Salinity
  - Land Use Planning and Urban Salinity
  - Site investigations for Urban Salinity
  - Roads and Urban Salinity
  - Building in a saline environment
  - Fallding M, McGhie S, and Nicolson R, 2005, *Land Use Planning and Urban Salinity*, Local Government Salinity Initiative - Booklet No.11, NSW Department of Planning, Infrastructure and Natural Resources
- Nicholson, A. (2021) *Urban Salinity Planning, Development and Management Guidelines (Scone NSW Pilot)*, NSW Department of Planning, Industry and Environment
- Cement and Concrete Association of Australia (2018) *Industry Guide T56 Residential Slabs and Footings in Saline Environments*, [https://www.ccaa.com.au/imis\\_prod/documents/INDUSTRY\\_GUIDE\\_T56\\_Residential\\_Slabs\\_and\\_Footings\\_in\\_Saline\\_Environments.pdf](https://www.ccaa.com.au/imis_prod/documents/INDUSTRY_GUIDE_T56_Residential_Slabs_and_Footings_in_Saline_Environments.pdf)