

## **STATE PLANNING POLICY 2/02**

### **Planning and Managing Development Involving Acid Sulfate Soils**

*Integrated Planning Act 1997*

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**Planning and Managing Development Involving Acid Sulfate Soils**

The Minister for Local Government and Planning adopted State Planning Policy 2/02 on 21 August 2002.

**Making of the State Planning Policy**

State Planning Policy 2/02 was made under Schedule 4 of the *Integrated Planning Act 1997*.

**Commencement**

State Planning Policy 2/02 **took effect on 18 November 2002.**

## POSITION STATEMENT

The Queensland Government considers that development involving acid sulfate soils in low-lying coastal areas should be planned and managed to avoid potential adverse effects on the natural and built environment (including infrastructure) and human health.

### 1. PURPOSE OF THE POLICY

- 1.1 This State Planning Policy ('the SPP') sets out the State's interests concerning development involving acid sulfate soils in low-lying coastal areas.

### 2. APPLICATION OF THE POLICY

- 2.1 Under the *Integrated Planning Act 1997* (IPA), the SPP has effect when certain development applications are assessed, when planning schemes are made or amended, and when land is designated for community infrastructure<sup>1</sup>.

#### Area to Which the Policy Applies

- 2.2 Within the local government areas listed in Annex 1, the SPP applies to all land, soil and sediment<sup>2</sup> at or below 5 metres Australian Height Datum (AHD) where the natural ground level is less than 20 metres AHD<sup>3</sup>.

#### Development to Which the Policy Applies

- 2.3 Within the area described in 2.2 above, the SPP applies to development involving any of the following activities:
- excavating or otherwise removing 100 m<sup>3</sup> or more of soil or sediment; or
  - filling of land involving 500 m<sup>3</sup> or more of material with an average depth of 0.5 of a metre or greater.

### 3. USING THE POLICY

- 3.1 The main outcome statements of the SPP are depicted in bold type (Outcome 1 and Outcome 2) and must be read in conjunction with the rest of the text. Technical terms are described in Section 9, Glossary.

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<sup>1</sup> The SPP 2/02 Guideline: *Acid Sulfate Soils* describes the effects of the SPP in more detail.

<sup>2</sup> See Section 9, Glossary.

<sup>3</sup> See diagram in Section 3 of the SPP 2/02 Guideline: *Acid Sulfate Soils*.

- 3.2 The SPP 2/02 Guideline: *Acid Sulfate Soils* (SPP 2/02 Guideline), as amended from time to time, provides information and advice about implementing this SPP, and is declared to be ‘extrinsic material<sup>4</sup>’ under the *Statutory Instruments Act 1992*.

## 4. THE NEED TO MANAGE ACID SULFATE SOILS

### What are Acid Sulfate Soils?

- 4.1 For the purpose of the SPP, the term ‘acid sulfate soils<sup>5</sup>’ includes both ‘potential’ and ‘actual’ acid sulfate soils unless stated otherwise. Acid sulfate soils occur naturally over extensive low-lying coastal areas, predominantly below 5 metres AHD. These soils may be found close to natural ground level but may also be found at depth in the soil profile. Actual acid sulfate soils generally overlie potential acid sulfate soil horizons, but both may also occur within the same layer and may not be mutually exclusive.

### Potential Adverse Effects From Disturbing Acid Sulfate Soils

- 4.2 Potential acid sulfate soils only become a problem when they are disturbed and exposed to air. Typically, excavating or otherwise removing soil or sediment, extracting groundwater<sup>5</sup> or filling land causes disturbance of acid sulfate soils. These activities can be an intrinsic part of land uses such as canal estates, high rise residential units, golf courses, sand/gravel extraction, aquaculture, and roads and other infrastructure.
- 4.3 When potential acid sulfate soils are oxidised<sup>5</sup>, sulfuric acid forms and the soil becomes strongly acidic (usually below pH 4). Strongly acidic soil can mobilise<sup>5</sup> the naturally occurring metals in the soil. These actual acid sulfate soils, and any subsequent leachate, can have significant adverse effects on the natural and built environment, the economy and human health due to the presence of abundant acid, iron, aluminium, manganese and possibly other heavy metals. For example, the release of acid and metal contaminants can:
- have significant adverse effects on the ecology of wetlands and shallow freshwater and brackish aquifer systems by degrading water quality, habitat, and dependant ecosystems;
  - have significant adverse consequences upon commercial and recreational fisheries and crop productivity;
  - corrode concrete and steel infrastructure, such as culverts, pipes and bridges, reducing their functional lifespan; and
  - lead to toxic concentrations of acid and metal contaminants which can cause dermatitis, while dust from disturbed acid sulfate soils may cause eye irritation.

### The Implications for Development

- 4.4 The potential effects of disturbing acid sulfate soils need to be addressed when planning for, or undertaking, development. While it is preferable to avoid disturbing acid sulfate soils, it is not the intention of the SPP to stop development because of acid sulfate soils. This is because the potential adverse effects of disturbance can be avoided or minimised by treatment and, in some cases, by ongoing management.

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<sup>4</sup> See Section 1 of the SPP 2/02 Guideline.

<sup>5</sup> See Section 9, Glossary.

- 4.5 Therefore, the presence (or possible presence) of acid sulfate soils is a development constraint that should be subject to an appropriately rigorous risk assessment. Determining the presence or absence of acid sulfate soils (and if required, treatment and management) can involve substantial costs that may compromise a project’s design or financial viability. These factors should therefore be taken into account as early as possible when considering projects in areas likely to contain acid sulfate soils.

## 5. DEVELOPMENT OUTCOMES AND DEVELOPMENT ASSESSMENT

- 5.1 This section sets out the development outcome expected in the areas to which this SPP applies<sup>6</sup>. When development applications are assessed against this SPP or land is being designated for community infrastructure, regard must be had to Outcome 1 and the remainder of Section 5. However, this SPP is not to be used when assessing development applications for building work assessable only against the *Standard Building Regulation*.

**Outcome 1. When undertaking development to which this SPP applies<sup>6</sup>, the release of acid and associated metal contaminants into the environment is avoided by:**

- **not disturbing acid sulfate soils when excavating or otherwise removing soil or sediment, extracting groundwater or filling land; or**
- **treating and, if required, undertaking ongoing management of any disturbed acid sulfate soils and drainage waters.**

- 5.2 Non-site specific or broad scale mapping of acid sulfate soils can only indicate where land has a high or low probability of containing acid sulfate soils. This SPP therefore assumes that all land, soil and sediment at or below 5 metres AHD may contain acid sulfate soils, unless site-specific information is available confirming the contrary.
- 5.3 When assessing development applications, the assessment manager will need to confirm whether the proposed development will disturb land, soil and sediment at or below 5 metres AHD and if so, whether acid sulfate soils are present in the area to be disturbed. Applications should include relevant information to assist efficient and timely processing. The SPP 2/02 Guideline provides advice on the information that should be provided with applications and how Outcome 1 can be achieved. If this information is not provided, it should be the subject of an information request under IDAS<sup>7</sup>.

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<sup>6</sup> See Section 2.

<sup>7</sup> See Section 9, Glossary.

## 6. MAKING OR AMENDING A PLANNING SCHEME

- 6.1 Planning schemes should aim to achieve Outcome 1 in Section 5 by identifying particular information, and containing appropriate planning strategies and development assessment measures.

**Outcome 2. For each local government identified in Annex 1, the planning scheme:**

- identifies areas with a high probability of containing acid sulfate soils;
- contains planning strategies that, as far as practicable, give preference to land uses that will avoid or minimise the disturbance<sup>8</sup> of acid sulfate soils;
- contains detailed measures, that;
  - a) include a code(s) designed to achieve development outcomes that are consistent with Section 5; and
  - b) ensure that development to which this SPP applies is assessable against that planning scheme code(s).

**The planning scheme or planning scheme policy(s) specifies the information expected to be submitted with development applications subject to the code(s).**

### Identifying High Probability Areas

- 6.2 The identification of areas with a high probability of containing acid sulfate soils is necessary to help devise appropriate planning strategies to avoid or minimise the disturbance of acid sulfate soils. In some localities *Special Acid Sulfate Soil Maps*<sup>9</sup> available from the Department of Natural Resources and Mines can be used to identify these areas.
- 6.3 If such mapping is not available, the SPP 2/02 Guideline identifies other sources of spatial information (e.g. descriptions of soil, landform, geology, geomorphology, vegetation, elevation, etc.) that can be used to indicate areas with a high probability of containing acid sulfate soils<sup>10</sup>. The Department of Natural Resources and Mines can provide further advice on how this information can be used to assist in the identification of high probability areas. However, it must be stressed that such information only indicates broad areas that **have a higher probability than other areas of containing acid sulfate soils and should not be relied upon at a site-specific level for development assessment**. Such maps are indicative and should not be confused with the *Special Acid Sulfate Soil Maps* produced by the Department of Natural Resources and Mines.

### Planning Strategies to Avoid or Minimise Disturbance

- 6.4 Although the potential adverse impacts associated with disturbing acid sulfate soils can be managed, it is preferable to avoid or minimise the risk of disturbance. Therefore, allocated land uses and associated development in areas that have a high probability of containing acid sulfate soils should, as far as practicable, give preference to land uses that avoid or minimise the disturbance of acid sulfate soils.

<sup>8</sup> See sentence 2, paragraph 4.2.

<sup>9</sup> See Section 9, Glossary.

<sup>10</sup> The SPP 2/02 Guideline lists geomorphic and site information that can be used to indicate high probability areas.

## **Detailed Planning Scheme Measures**

- 6.5** The combination of development assessment categories and code(s), together with other supporting assessment provisions, need to ensure that all relevant development<sup>11</sup> is assessed against specific development standards that are consistent with Section 5. The SPP 2/02 Guideline provides further advice on how this can be achieved.
- 6.6** Section 5 describes the basis for information that should be submitted with development applications. If this information is not provided, the planning scheme or supporting planning scheme policy(s) should make it clear that the information will be subject to an information request under IDAS<sup>12</sup>. In this way, an appropriately rigorous level of identification and analysis is made available to assist the assessment of development applications.

## **7. INFORMATION AND ADVICE ON THE POLICY**

- 7.1** The Department of Natural Resources and Mines can provide maps on the location and depth of acid sulfate soils in some areas. The Department has an on-going acid sulfate soils mapping program. The Department can also provide appropriate topographic data for some areas. The Department also produces technical guidelines on how to identify, manage and treat acid sulfate soils. The Department will also provide advice on certain development applications involving acid sulfate soils (see Section 8).
- 7.2** The Department of Local Government and Planning can provide advice about reflecting the SPP in planning schemes and the operation of IDAS.
- 7.3** Local governments can provide advice about the application of the SPP in their local area. Some local governments may be able to provide advice about the location of acid sulfate soils in their area.
- 7.4** The Department of Primary Industries can provide maps and advice on the location and extent of marine vegetation in Queensland. This information can assist in identifying areas with a high probability of containing acid sulfate soils.

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<sup>11</sup> See Section 2.

<sup>12</sup> See Section 9, Glossary.

## 8. RESPONSIBILITIES OF STATE GOVERNMENT AGENCIES

8.1 The following agencies have statutory responsibilities regarding the planning and management of development involving acid sulfate soils:

- The Department of Natural Resources and Mines, in conjunction with the agencies listed below, is responsible for ensuring consistent advice from the State Government on development involving acid sulfate soils. The Department is an ‘advice agency’ for development specified in the *Integrated Planning Regulation*.
- The Environmental Protection Agency is responsible for the administration of the *Environmental Protection Act 1994*. Under that Act and the *Environmental Protection (Water) Policy 1997* and *Environmental Protection (Air) Policy 1998*, State and local governments and the community are to take all reasonable and practical measures to avoid causing environmental harm.
- The Department of Primary Industries can provide advice about the management and protection of fish habitats and fisheries. The Department is responsible for the administration of the *Fisheries Act 1994* and *Fisheries Regulation*.

## 9. GLOSSARY

9.1 The following terms are used in the SPP as defined below:

**Acid sulfate soils:** Soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of iron sulfides (*actual acid sulfate soils*) and/or soil or sediment containing iron sulfides or other sulfidic material that has not been exposed to air and oxidised (*potential acid sulfate soils*).

**Note:** The term acid sulfate soil generally includes both actual and potential acid sulfate soils. Actual and potential acid sulfate soils are often found in the same soil profile, with actual acid sulfate soils generally overlying potential acid sulfate soil horizons.

**Actual acid sulfate soils (AASS):** Soil or sediment containing highly acidic soil horizons or layers affected by the oxidation of soil materials that are rich in iron sulfides, primarily pyrite. This oxidation produces hydrogen ions in excess of the sediment’s capacity to neutralise the acidity, resulting in soils of pH 4 or less. These soils can usually be identified by the presence of jarosite.

**Potential acid sulfate soils (PASS):** Soil or sediment containing iron sulfides or sulfidic material, that have not been exposed to air and oxidised. The field pH of these soils in their undisturbed state is pH 4 or more, and may be neutral or slightly alkaline.

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**Advice agency:** For a development application, means an entity prescribed under an *Integrated Planning Act* regulation as an advice agency for the application. An advice agency is an entity from which a proponent must seek advice in relation to any proposed development. This entity has no legislative power with regard to setting conditions on the development. The assessment manager must consider the advice but does not have to follow it.

**Australian Height Datum (AHD):** The datum used for the determination of elevations in Australia. The determination uses a national network of bench marks and tide gauges, and sets mean sea level as zero elevation.

**Community infrastructure:** Infrastructure specified by the IPA.

**Extracting groundwater:** This includes drainage, pumping or otherwise removing groundwater.

**Groundwater:** Subsurface water in the zone of saturation, including water below the watertable and water occupying cavities, pores and openings in underlying soil and rock.

**IDAS:** Integrated Development Assessment System is a framework that establishes a common statutory system for making, assessing and deciding development applications.

**Leachate:** The soil constituent that is washed out from a mixture of soil solids.

**Mobilise:** Situation where the naturally occurring metals in soil or sediment are changed from an insoluble to a soluble state.

**Oxidised:** Process of chemical change involving the addition of oxygen following exposure to air.

**pH:** A measure of the acidity or alkalinity of a soil or water body on a logarithmic scale of 0 to 14; a pH <7 is acid, pH 7 is neutral, and pH >7 is alkaline. Note that one unit change in pH is a ten-fold change in acidity.

**Soil profile:** This is a representation of spatial proportions of the different vertical layers in a soil body; each layer has individual chemical and physical properties which govern its behaviour.

**Soil and Sediment:** The natural accumulation of unconsolidated mineral particles (derived from weathered rocks) and organic matter that covers much of the earth's surface. The chemical and physical composition varies greatly between soil and sediment types. Clays, silts, sands, gravels, peats, muds and indurated sands (e.g. 'coffee rock') are all examples of soil and sediment.

**Special Acid Sulfate Soil Maps:** Mapping prepared and presented in accordance with the Department of Natural Resources and Mines requirements for map reliability and scale, sampling equipment, soil core integrity and depth, site information, sampling, field testing and laboratory analysis. These maps are scale specific, and should only be used in keeping with information defining their proper use. See Appendix 7 in SPP 2/02 Guideline for additional information.

**Watertable:** Portion of the ground saturated with water; often used specifically to refer to the upper limit of the saturated ground.

## ANNEX 1

**A1.1** The SPP applies in the following local government areas as they were defined on 1<sup>st</sup> June 2002.

Aurukun	Calliope	Hervey Bay	Noosa
Bowen	Caloundra	Hinchinbrook	Pine Rivers
Brisbane	Cardwell	Isis	Redcliffe
Broadsound	Carpentaria	Johnstone	Redland
Bundaberg	Cook	Livingstone	Rockhampton
Burdekin	Cooloola	Logan	Sarina
Burke	Douglas	Mackay	Thuringowa
Burnett	Fitzroy	Maroochy	Tiaro
Caboolture	Gladstone	Maryborough	Torres
Cairns	Gold Coast	Miriam Vale	Townsville
		Mornington	Whitsunday

**A1.2** The areas subject to this SPP are not altered by administrative changes to local government boundaries or names.

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**Published by:**

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Copies of the State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* and its supporting Guideline are available by contacting the above or on the Department of Natural Resources and Mine's website at [www.nrm.qld.gov.au](http://www.nrm.qld.gov.au) as well as the Department of Local Government and Planning's website at [www.dlgp.qld.gov.au](http://www.dlgp.qld.gov.au).

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## NOTES