

Acid Sulfate Soil Planning Scheme Policy

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1 Introduction

Under the Act, the Integrated Development Assessment System allows for Council and other referral agencies to request additional information to assist in assessing a development proposal.

Additional information, in the form of an Acid Sulfate Soil Investigation as part of the general planning report, will be requested by the assessment manager and/or a referral agency to assist in assessing proposals that:

- will result in significant disturbance of soils below 5m Australian Height Datum (AHD) where the soil type/geology has acid sulfate potential, i.e. in any area highlighted on an Acid Sulfate Soil Hazard Distribution Map
- will result in significant lowering of watertables in soils below 5m AHD where the soil type/geology has acid sulfate potential i.e. in any area highlighted on an Acid Sulfate Soil Hazard Distribution Map, or
- are requested to supply additional information as part of a licence or permit.

The purpose of this additional information is to ensure that acid sulfate soils are managed in accordance with the principles of Ecologically Sustainable Development, and reasonable and practicable measures are taken to minimise the risk of environmental harm from acid sulfate soils as required under the *Environmental Protection Act 1994*.

State Planning Policy 2/02—Planning and Managing Development Involving Acid Sulfate Soils and the associated guidelines provide additional information on the management and investigation of acid sulfate soils.

The possible impacts associated with the disturbance of acid sulfate soils are outlined below.

The preparation of an investigation report assists in managing these impacts by influencing the design, location, form and character of development in areas that possess these soils.

This Planning Scheme Policy outlines:

- the circumstances where an acid sulfate soil investigation report is likely to be requested
- the type of additional information likely to be requested
- the circumstances under which an acid sulfate soil management plan is likely to be requested.

What are acid sulfate soils?

‘Acid sulfate soils’ is the common name given to soils containing iron sulfides (usually Pyrite, FeS_2) that, if oxidised, produce sulfuric acid.

When exposed to air, either naturally (e.g. during a drought), through soil disturbance (e.g. dredging or excavation) or through a lowered watertable (e.g. drain construction), the sulfides oxidise to produce sulfuric acid. The disturbance of acid sulfate soils can therefore result in soil and groundwater becoming acidic.

‘Potential acid sulfate soils’ are soils that have the potential to oxidise and produce sulfuric acid. These soils typically exist in a water logged environment (e.g. below the water table), where the sulfides are prevented from reacting with oxygen in the air.

‘Actual acid sulfate soils’ are those acid sulfate soils that have been exposed to oxygen in the air and the sulfuric acid produced is in excess of the soil buffering capacity. The resulting acid may acidify soil, ground water and/or surface waters.

What are the impacts of acid sulfate soils?

Acidic drainage from acid sulfate soils can cause significant harm to the environment, important fisheries and corrodible assets. For example, acidic drainage can:

- dissolve iron, aluminium, manganese and other heavy metals in the soil that are then able to be taken up by plants and animals, which may result in their death
- significantly degrade important aquatic habitats, including fisheries
- contribute to an increase in fish mortality, disease, e.g. Red Spot disease, and algal blooms
- reduce the biodiversity in the City’s waterways and wetlands
- corrode infrastructure containing concrete and metal, e.g. culverts, bridges and stormwater drains.

Where are acid sulfate soils found?

In Brisbane, acid sulfate soils are generally found below 5m AHD (more commonly below 2m AHD) and in Holocene sediments (organic-rich muds and silts)

formed in the last 7,000 years, e.g. coastal lowlands and estuarine flood plains.

Council has indicated on its BIMAP GIS system where acid sulfate soils are **likely** in the City. This information can be accessed by all stakeholders. In addition, the Department of Natural Resources has undertaken some very large scale distribution mapping in the City as part of developing Risk Maps for South East Queensland.

2 Acid sulfate soil investigation reports

An acid sulfate soil investigation report explains the methodology and findings of an investigation to determine the extent and severity of acid sulfate soils on a given site. This report will evaluate the potential for harm to the environment or to constructed assets as a result of the proposed development and make recommendations as to whether management measures are needed.

When an acid sulfate soil investigation is required, it is to be undertaken in strict accordance with current and locally applicable technical guidelines such as the *State Planning Policy 2/02 Guideline—Planning and Managing Development involving Acid Sulfate Soils (2002)* produced by Natural Resource Sciences, Department of Natural Resources and Mines and Planning Services, Department of Local Government and Planning. The investigation is also to be undertaken by an appropriately qualified and experienced person. An investigation is to be done very early in the project's life as the findings may significantly influence issues such as design, timing and the financial viability of the project.

The investigation report is to be submitted along with the development application. If the investigation report finds that acid sulfate soils will be affected by the proposed development, then a management plan is to be prepared.

3 Acid sulfate soil management plans

Management plans for acid sulfate soils explain how acid sulfate soils will be managed on sites to minimise or prevent harm to the environment or to constructed assets. These plans will be consistent with current State Government technical guidelines for the assessment and management of acid sulfate soils.

Management plans for acid sulfate soils can take 2 forms under the **Acid Sulfate Soil Code**:

A 'preliminary acid sulfate soil management plan' is only applicable when the development will disturb

less than 500m³ of soil and the water table is not affected. Development approval can be given prior to the preparation of a 'preliminary acid sulfate soil management plan' but must be prepared prior to any works commencing on the site. The intent of this form of plan is to ensure that development is not unreasonably delayed when small amounts of acid sulfate soil are disturbed, groundwater is not affected, and therefore there is a low potential for environmental harm and/or significant corrosion of assets as a result of acid sulfate soil disturbance.

An 'acid sulfate soil management plan' is only applicable when the development will disturb greater than 500m³ of soil and/or the watertable is affected. Development approval will not be given prior to the preparation of an 'acid sulfate soil management plan'.

An acid sulfate soils management plan, including a preliminary acid sulfate soil management plan, is to be prepared prior to soil disturbance and is to include:

- at least a 2 dimensional map of the potential acid sulfate soils to at least the depth of disturbance
- details that reflect potential on-site and off-site impacts of the disturbance of the soil and/or the groundwater levels
- the methods that will be used to avoid, treat or otherwise manage acid sulfate soils including the contained on-site management and treatment of potential and actual acid sulfate soils
- details of the management of the height of the groundwater table on and off the site both during and after construction
- details of all soil and water monitoring, both manual and automated, to be performed during and after treatment, and including verification testing of soils
- details of handling and storage of neutralising agents
- details of contained on-site treatment and management of potentially contaminated stormwater run-off, and leachate (including details of groundwater management) associated with the works both in the short and long term
- a description of contingency procedures to be implemented on and off the site if the management procedures prove to be unsuccessful and acid is generated and/or leachate problems occur
- details of the treatment and management of surface drainage waters for disturbed acid sulfate soils.

This plan is to provide for the ongoing management and monitoring of impacts of acid sulfate soil material throughout the construction and operation of the

project and describe the construction schedules and environmental management procedures. The development is to be staged so that the potential impact of any area disturbed at any 1 time is limited and easily managed.

The acid sulfate soil management plan can form part of a broader environmental management plan.

4 Environmental management

Action is to be taken to prevent and/or minimise any adverse impacts on surface water, ground water, the site and surrounding areas. These actions are to be detailed in an environmental management plan. Consideration is to be given to protecting engineered structures from the corrosive properties of acid sulfate soils and associated waters.

The environmental management plan is to include objectives and outcomes, management measures, performance indicators, elements to be monitored, a monitoring schedule, contingency plans, responsibilities, reporting and review requirements, and training arrangements.