

GUIDING PRINCIPLES FOR MANAGING ASS

Once disturbed the management and control of ASS become considerably more difficult and costly. The best solution for dealing with ASS is to avoid them. Consideration should be given to moving the development but if this is not possible options for minimising the disturbance of the material should be considered. If disturbance of ASS is likely then a management plan is required. This plan should identify the risks and detail the technical feasibility of the measures proposed to manage those risks.

Options for minimising disturbance include neutralisation of all existing and potential acidity, redesign of drains to minimise disturbance of ASS or burial of ASS materials to create a buffer between excavations and ASS materials. Considerations should be given to the impact of disturbance on groundwater levels, degree of exposure of ASS materials to oxidising environments, and management of spoil or dredged material removed from waterways.

The Tasmanian guidelines also provide information on the requirements for site inspections, number and depth of soil observations and information to be recorded, soil sampling techniques, sample care and preparation, and field and laboratory tests for ASS.



LINKS AND OTHER INFO

For detailed information on planning requirements see *Tasmanian Acid Sulfate Soil Management Guidelines*. Maps identifying the predicted distribution of ASS are available on the web at www.thelist.tas.gov.au.

Additional information is available through the Land Conservation Branch of DPIPW (03 6336 5441 or <http://www.dpipwe.tas.gov.au/inter:nsf/ThemeNodes/EKOE-4ZG66F?open>).

A wide variety of information has been published on the web by most other State and Territory agencies. A national strategy for the Management of Coastal Acid Sulfate Soils has been developed and is downloadable as a pdf document from www.environment.gov.au/coasts/cass/index.html

The information provided in this leaflet is intended for general information only. For more information on planning requirements in ASS affected areas and specific guidance on the management of ASS please contact either your local authority or DPIPW.

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Acid Sulfate Soils

Information for Planners & Developers



CARING FOR OUR COUNTRY



Sustainable Land Use

Department of Primary Industries,
Parks, Water and the Environment



WHAT ARE ACID SULFATE SOILS?

Acid sulfate soils (ASS) are naturally occurring soils that contain iron sulfides usually in the form of iron pyrite. Two forms of acid sulfate soil occur – those in which the pyrite remains in a reducing environment (i.e. saturated with water and described as potential acid sulfate soils or PASS) and those in which the pyrite has been oxidised through exposure to the air resulting in the formation of sulfuric acid (actual acid sulfate soils or AASS).

WHY ARE THEY A PROBLEM?

In their natural waterlogged state PASS are harmless as the acidity remains locked up in the soil and pHs may typically be 6.5 to 7.5 or even higher. When disturbed, usually through excavation or drainage, oxidation of the pyrite can occur leading to the formation and release of sulfuric acid. The release of significant quantities of acid can rapidly lower pH values of soil and drainage water to pH 2 or less. Such acid conditions can result in a range of environmental, engineering, infrastructure and health related impacts.

Highly acidic leachates can corrode metal pipes and eat away at concrete structures such as buildings, bridges and dams. Environmentally, ASS can impact on river health, causing riparian vegetation die-back, fish deaths, decline in biodiversity and harmful algal blooms. At low pH some elements such as aluminium and arsenic become more soluble and there is greater risk of toxic levels occurring in waterways.

Unlike other States and Territories of Australia the pressure for coastal development around Tasmania has, until recently, been low and consequently areas of PASS have remained undisturbed and, often, unidentified. There are signs that this pressure is increasing and it is important that planners and developers are aware of the risks and appropriate management strategies.



WHERE DO THEY OCCUR?

Acid sulfate soils form naturally where sulfate rich materials mix with materials containing iron and organic matter. In Tasmania these conditions are often found in coastal landscapes at elevations below 20 m AHD (above sea level) and are typically associated with dark organic-rich sediments and peats found in tidal zones, estuaries, swamps and wetlands. Recent investigations by DPIPW have also revealed the presence of ASS associated with inland lagoons and swamps. Around Tasmania significant areas of ASS are known to occur across the north coast including Mella Swamp, Tamar Estuary, Waterhouse, King and Flinders Islands and parts of the east coast at Moulting Lagoon and St Helens.

ACTIVITIES THAT CAN LEAD TO DISTURBANCE OF PASS

Any activities that are planned for areas in which ASS may occur and which run the risk of disturbing the ASS materials must include a risk assessment. If the disturbance is likely to be minor then no further action may be required. If the disturbance is likely to be major then detailed assessments of the extent and severity of the issue are required, together with a plan for management. The *Tasmanian Acid Sulfate Soil Management Guidelines* set out the requirements for ASS management plans. Activities that may impact on ASS include:

- » Major earthworks for construction, e.g. canal estates
- » Excavations for roads, pipelines, power lines and drainage channels.
- » Dredging of water ways.
- » Cleaning of drainage channels in agricultural areas.
- » Lowering of groundwater tables either through pumping, drainage or simply lack of rainfall.

PLANNING GUIDELINES FOR ASS

The following diagram highlights the proposed steps to be undertaken when preparing or reviewing a planning application.

Guidelines detailing the principles for managing ASS materials, the requirements of a site inspection report and the level of detail required in a management plan are presented in the *Tasmanian Acid Sulfate Soil Management Guidelines*.

