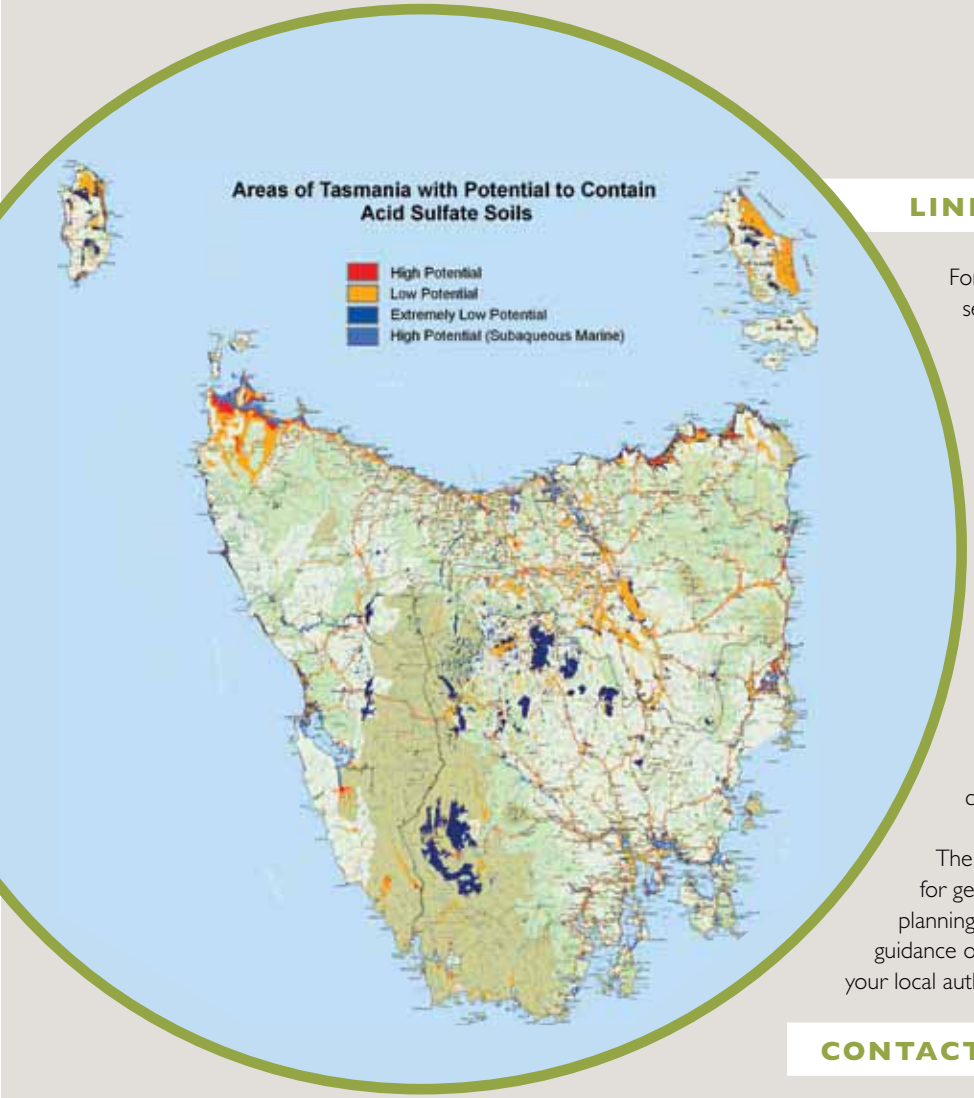

LINKS AND OTHER INFO

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 DPIPWE (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 DPIPWE.

CONTACT DETAILS

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Tasmania
Explore the possibilities

Acid Sulfate Soils

Indicators for Field Operators

CARING FOR OUR COUNTRY

Cradle Coast NRM
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Sustainable Land Use
Department of Primary Industries, Parks, Water and the Environment

Tasmania

WHAT ARE ACID SULFATE SOILS?

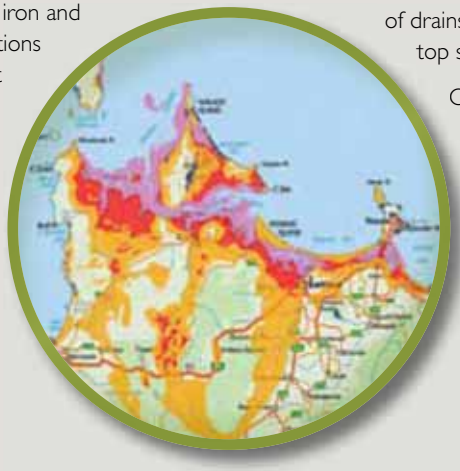
Acid sulfate soils (ASS) are naturally occurring soils that contain iron sulfides usually in the form of iron pyrite. Two forms of acid sulfate soil occur – those in which the pyrite remains in a reducing environment (i.e. saturated with water and described as potential acid sulfate soils or PASS) and 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. At low pH some elements such as aluminium and arsenic become more soluble and there is greater risk of toxic levels occurring in waterways. Such acid conditions can result in a range of environmental, engineering, infrastructure and health related impacts.

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 DPIPWE have also revealed the presence of ASS associated with inland lagoons and swamps.



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.
- Major earthworks for construction, canal estates, etc.
- Excavations for roads, pipelines, powerlines and drainage channels.
- Dredging of water ways.
- Excavation of drainage channels (including "hump and hollow") in agricultural areas.
- Lowering of groundwater tables either through pumping, drainage or simply lack of rainfall.

RECOGNISING THE INDICATORS OF ASS

The presence of ASS is hardest to identify prior to any disturbance occurring. Vegetation cover may give clues as to the occurrence of bogs and swamps. These might include paper bark trees, couch grasses and rushes. Soil materials may include sticky grey to bluish grey sediments (possibly streaked with orange or yellow) and gooey black sediments that may have formed at the bottom of drains or similar wet areas. Surface scalds may occur where the top soil is acidic.

Once the soils have become AASS the evidence is often much clearer – but it is also often much harder to correct. Obvious indicators may include:

- Soil with materials that typically include orange material or prominent yellow mottles;
- Testing with field pH indicators will typically reveal pH of below 4;
- Rotten egg gas smell from freshly exposed soils.

Water in drains and creeks may change colour due to increased levels of iron or aluminium that become more soluble at lower pHs. This can be characterised by:

- Crystal clear waters, high in aluminium that can cause soil particles to drop to the bottom of the creek or drain;
- Blue green or milky white water – caused by aluminium flocculants depending on the pH of the water;
- Yellowish brown water containing high levels of iron that often deposits on the bottom or banks of a creek or drain leaving reddish brown deposits (iron staining);
- Reddish brown colouration caused by the flocculation of iron.

WHAT SHOULD I DO?

Firstly, be aware as to whether the proposed activity is likely to be in an area at risk from ASS. View the map available through The List (www.thelist.tas.gov.au) to see where ASS are predicted to occur. Remember, highest risk areas occur where saturated organic sediments (dark coloured soils) occur below 20 m AHD.

If you are working in an area where ASS may occur be observant. Keep an eye out for the signs and indicators of both PASS and AASS. If you see any evidence, or are in doubt about whether ASS may exist, STOP and advise your supervisor.