

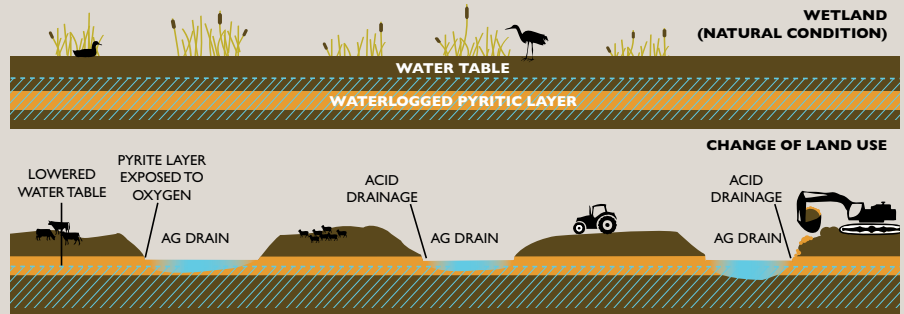
What are

Acid Sulfate Soils?

Acid sulfate soils (ASS) are naturally occurring soils that contain iron sulfides usually in the form of iron pyrite.

HOW DO ASS FORM?

Acid sulfate soils form where there is an accumulation of sulfur and organic matter in a reducing, or waterlogged, environment. These waterlogged environments are ideal for the formation of sulfide-containing minerals, such as iron sulfide, which can, when exposed, react with oxygen in the air, or dissolved in water, to produce sulfuric acid. Coastal landscapes have the greatest quantities of stored pyrite due to deposition of sediments during times of higher sea level or in current tidal sediments and estuaries.



WHY ARE THEY A PROBLEM?

In their natural waterlogged state ASS 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, through excavation or drainage, oxidation of the pyrite leads to the formation and release of sulfuric acid. If left untreated this can result in a range of environmental, engineering, infrastructure and health related impacts.

RECOGNISING THE INDICATORS OF ASS

The presence of ASS is hardest to identify prior to any disturbance occurring.

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 been disturbed the evidence of ASS is often much clearer – but it is also often much harder to correct. Obvious indicators may include:

- » field pH indicators that typically reveal pH of below 4.
- » Rotten egg gas smell from freshly exposed soils.
- » Soil materials with orange material or prominent yellow mottles.
- » Water in drains and creeks may change colour due to increased levels of iron or aluminium that become more soluble at lower pHs:
- » 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.

WHERE DO THEY OCCUR?

Acid sulfate soils form naturally in coastal landscapes at elevations below 20 m AHD (above sea level) and are typically associated with dark organic rich muds and peats found in tidal zones, estuaries, swamps and wetlands. ASS can also be found in 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 including St Helens, Moulting Lagoon and Swansea.

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.



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