State Strategy is being developed.

Identifying Acid Sulfate Soils (ASS)

and indicators of their disturbance on your property

The term "Acid Sulfate Soil" refers to a whole soil profile consisting of oxidising materials above the water table (known as "Actual Acid Sulfate Soil" or AASS) and unoxidised material below the water table (known as "Potential Acid Sulfate Soil" or PASS). To identify these you will need to be able to dig a test pit to just below the water table and be able to measure pH (with pH test papers or a meter). ASS are most likely to occur in low-lying swampy areas of your property where the water table is near the surface. Typically, these are areas where Melaleucas, Saltwater Sheoaks and rushes grow.

Firstly, look at the material above the watertable. It will typically have a mottled appearance. Mix about 1 teaspoon of soil material with about 5 teaspoons of distilled water and measure the pH. AASS materials typically have a field pH of less than 4. The presence of straw-yellow to butter-yellow mottles in the soil profile is indicative of AASS – these are made up of an iron sulfate mineral called jarosite which only forms when the soil pH is less than about 3.5.

Now look at the material below the water table. This may vary in texture (clay, silt or sand) but will typically have a "gun metal" grey colour, often with an odd greenish tinge that disappears rapidly on exposure to air. The pH of a soil paste of this material is usually about 7 to 8. Now put a sample in a Zip-lock sandwich bag and leave in a warm place indoors (not too hot, and do not let the material dry out). If you see yellow mottles of jarosite developing in the material, it is definitely PASS.

For a more rapid assessment of PASS, react one teaspoon of soil with 5 teaspoons of 30% hydrogen peroxide in a small plastic container (**CAUTION!** This is a very hazardous chemical that can cause severe burns –always wear gloves and eye protection when using concentrated hydrogen peroxide). If the material is PASS, there will be a violent reaction after about 5 to 10 minutes, and the final pH of the solution may be less than 3. The greater the pH change, and the lower the final pH, the higher the pyrite content of the soil is likely to be.

In addition to looking at soil profiles, there are a number of visual indicators that ASS have already been disturbed and are generating acid on your property. Typical signs in drains or other surface water bodies are: opaque yellow-brown or red-brown water due to a thick suspension ("floc") of iron oxides; turquoise milky coloured water due to aluminium oxide floc; or crystal-clear water with iron or aluminium precipitates sitting on the bottom. You may also see a jet-black oily looking material accumulating on the bottom in deeper parts of your drains. This is iron monosulfide black ooze which forms as a result of dissolved iron reacting with organic carbon in drains. This material is washed away when there is heavy rainfall, and can rapidly deoxygenate water and cause fish kills in water bodies that receive discharge from drains.

In areas where ASS have been disturbed you are also likely to see iron monosulfides forming at the surface, usually beneath cyanobacteria mats or adjacent to clumps of vegetation. This material oxidises during dry summer months to form acidic salts that are washed into surface drainage with the first rainfall of the season.