Policy 14: Management of Activities Located within Areas of Acid Sulfate Soils

Chapter 1 Policy Objective

The objective of this policy is to assist in the effective management of acknowledged issues associated with activities to be located within areas of acid sulphate soils in a proper scientific manner, consistent with the principles of Ecologically Sustainable Development (ESD).

Chapter 2 Introduction

The Gold Coast City Council is committed to the principles of ESD as part of its Corporate Plan. The protection of the environment is an integral component of Council's ongoing management of the community's natural resources. Council, as well as the community, has a demonstrable duty of care to ensure that the environment is protected, maintained and, where necessary, enhanced.

Council is well aware of the existing and potentially detrimental effects associated with exposing acid sulphate soils. These include the degradation of lands, major impacts on aquatic ecology and water quality, and the corrosion of infrastructure. The policy defines Council's position on the disturbance of these soils and gives technical guidance in their assessment and management. Compliance with this policy may be satisfied if an Environmental Impact Statement, which specifically includes sections that meet the requirements of this policy, is prepared.

The **Environmental Protection Act 1994** (**EPA**) establishes a direction for the environmental management of resources, consistent with ecologically sustainable development. The **EPA** is the basis for identification of activities required to comply with this policy.

The policy is designed to ensure that any proposed works, particularly within the coastal lowlands, are fully assessed prior to any disturbance. This policy does not include day to day agriculture practices, such as tilling of land. While the policy may not include these activities, those engaging in such activities have a general duty of care as defined in the **EPA** to ensure that environmental harm does not result.

This policy is intended to be consistent with the provisions of **SPP2/02 – Planning and Managing Development Involving Acid Sulfate Soils**.

Chapter 3 Activities to Which this Policy Applies

Policy	Explanatory Notes
3.1 Any proposed activity that is to be located at or below five Australian Height Datum (AHD) and within, but not limited to, the following categories: a) excavation below five metres AHD; b) disturbance of soil below water table; c) alteration to local or regional hydrology by excavation; d) any activity that lowers the water table level below the acid sulphate soil layer; e) any activity which involves acid sulphate soils; and f) any area identified as containing possible acid sulphate soils shall: 3.1.1 if classed as an ERA, make an application for an environmental authority under the **EPA** to the appropriate administering authority and; a) conduct an Environmental Investigation as defined in the **EPA**, **Division 3 Part 5 – Environmental Evaluations**; or b) submit for approval a draft Environmental Management Program (**EMP**), as defined in the **EPA**, **Division 3 Part 6 – Environmental Management Program**, to the administering authority and Council. Either **a)** or **b)** shall be submitted prior to any works commencing or as part of any application made pursuant to the provisions of the Planning Scheme. 3.1.2 if not classed as an ERA: a) prepare an environmental investigation as defined in the **EPA**, **Division 3 Part 5 – Environmental Evaluations**; or b) submit for approval a draft **EMP** as defined in the **EPA**, **Division 3 Part 6 – Environmental Management Program**, to the administering authority and Council. Either **a)** or **b)** shall be submitted prior to any works commencing or as part of any application made pursuant to the provisions of the Planning Scheme.	The **Environmental Protection (Interim) Regulation** (**1995**) identifies Environmentally Relevant Activities (ERAs) which require an environmental authority. It also identifies whether the administering authority is Council or the Queensland Department of Environment. If the activity, or proposed activity, is causing, or is likely to cause, serious or material environmental harm, then an Environmental Investigation will be required. The environmental degradation resulting from the ineffective management of acid sulphate soils may constitute environmental harm as defined in the **EPA**. Ignorance of the existence of acid sulphate soils may not be a defence under the **Act**.

Chapter 4 Environmental Investigation

Policy	Explanatory Notes
4.1 The environmental investigation shall be conducted to the satisfaction and approval of Council and with the administering authority.	The purpose of an environmental investigation is to confirm the presence or absence and extent of acid sulphate soils and to assess the impact of the subsequent disturbance of these soils. To do this, the abundance of any iron sulphites (pyrite) present in the soil and the potential of the soil to generate acid should be investigated.
4.2 The environmental investigation is to be undertaken, prepared and certified by a suitably qualified consultant with demonstrated knowledge and relevant experience in acid sulphate soil investigations acceptable to Council.	A suitably qualified consultant would have, for example, qualifications and experience in environmental soil science with specialisation in soil chemistry and hydrology.
4.3 The environmental investigation shall adequately assess the extent of environmental harm likely to be caused by the oxidation of acid sulphate soils associated with the proposed activity.	Acid sulphate soils can occur in discrete lenses within the soil profile at varying depths. A minimum assessment protocol may include, but should not be limited to: a) the examination of existing information; b) aerial photography; c) geomorphologic investigations; d) infield sampling and analysis and any subsequent laboratory analysis; e) the examination of previous excavations in the immediate vicinity; and f) visual evidence of acid sulphate effects. Establishing the baseline conditions in and around the site, especially for surface waters, is an integral part of the establishment of future water quality objectives. The earlier this occurs, the greater the certainty that the future water qualities, nominated within the program, will be achieved. As a rule, Council will only consider work of an appropriately high professional standard, based on sound scientific principles and best available technology. The consultant shall undertake sufficient examination to determine the extent of acid sulphate soils. A minimum soil sampling protocol would involve a recommended minimum sampling point density of 2 boreholes per hectare (for extensive excavations the boreholes should be located on a 50 – 150 metre grid). The number of sampling points will obviously depend on the area of land and variability of soil characteristics, but should give good coverage of the land which is to be affected by the proposed activity. A staged sampling plan may reduce the number of boreholes required. Consultation with Council and/or State Government is required to formulate a staged sampling strategy. Current sampling procedures should be obtained from Council and followed closely to ensure that laboratory results are valid.

Policy	Explanatory Notes
	At each profile, the following soil and site characteristics should be recorded: a) at each sampling point, the depth of investigation shall be at least 0.5 metres below the depth of the proposed excavation or estimated drop in water table level; b) the site and soil characteristics shall be recorded at each profile inspection; c) site conditions, including depth to water table; d) landform element and vegetation; e) soil profile description (for each soil horizon, record at least, texture, structure, ripeness, colour, amount, colour and character of mottles, field pH, peroxide treated pH, presence and type of concretions, segregation or coarse fragments, nature of boundary and lower depth; and f) morphological features indicating actual acid sulphate conditions (jarosite mottles) and natural water table fluctuations. Sampling methodology should include the following: a) samples of soil of approximately 0.5 – 1kg each shall be collected at least at every soil horizon or every 0.5 metres or horizon change, whichever is less; b) the method of sampling employed should result in a minimally disturbed, uncontaminated sample; c) the sampling equipment used should be identified; and d) after collection, soil samples should be kept chilled or frozen until analysed. Rapid drying at 80° – 85°C, for a specified time, is required for dry sample analysis. The potential acid generation from the site must be assessed in a quantitative manner. A minimum surface and groundwater sampling protocol will involve: a) a catchment analysis (including current and future catchment areas, tidal influence, drainage patterns and the sensitivity of receiving waters); b) depth to water table; c) confirmation of any groundwater resource; d) PH; e) dissolved oxygen; f) electrical conductivity; g) Chloride to sulphate ratio; h) alkalinity; i) aluminium; j) iron; k) manganese; and l) seasonal variation in ground and surface water levels.
4.4 If Council accepts the environmental investigation report and the extent of environmental harm likely to be caused is manageable, an **EMP** is to be prepared and submitted to Council and the administering authority.	This is self explanatory.

Policy	Explanatory Notes
4.5 If it cannot be demonstrated that the acid sulphate risk is manageable, the activity shall not proceed.	Demonstrating that the risk is manageable will involve providing Council with sufficient scientific evidence to verify that a selected treatment option (or combination of options) will be successful.
4.6 If, from the environmental investigation, it is unclear whether the extent of environmental harm likely to be caused is manageable, a pilot project and/or field trial may be required. Should the outcome of the pilot project and/or field trial conclude that the acid sulphate risk is manageable, an **EMP** is to be submitted to Council and the administering authority. If it cannot be demonstrated that the acid sulphate risk is manageable, the activity shall not proceed.	A pilot project or field trial should: a) prove the effectiveness and feasibility of new technology or selected management procedure(s) to deal with the acid sulphate soils and other environmental impacts for all soil conditions on the site; b) demonstrate that the proponent is capable of implementing those management procedures effectively; and c) meet agreed standards and performance targets. Prior to commencing a pilot project, Council and the administering authority shall be consulted. The pilot project shall describe: a) the management procedures or options being tested; b) the monitoring program; c) the performance standards to be achieved; and d) contingencies, in the event that environmental harm occurs from the pilot project or field trials. The pilot proposal shall include: a) a precise description of the location; b) scale and time frame of the trial; c) the commencement date; and d) a full outline of restoration works to be undertaken if the pilot project demonstrates that the acid sulphate risk is not manageable. If the trial demonstrates that the acid sulphate risk is manageable, the monitoring data and a review of the operational efficiency of the works should be used to refine the **EMP**.

Chapter 5 Environmental Management Program

Policy	Explanatory Notes
5.1 The **EMP**, as defined in the **EPA**, **Division 3 Part 6 – Environmental Management Program**, must be prepared to the satisfaction and with the approval of Council and the administering authority.	An **EMP** is a specific program that, when approved, achieves compliance with the **EPA** for the matters dealt with by the program by: a) reducing environmental harm; or b) detailing the transition to an environmental standard.
5.2 The **EMP** is to be undertaken, prepared and certified by a suitably qualified consultant (acceptable to Council and the administering authority) with demonstrated knowledge and relevant experience in the management of acid sulphate soil.	A suitably qualified consultant would have, for example, qualifications and experience in environmental soil science with specialisation in soil chemistry and hydrology.
5.3 The **EMP** shall state the objectives to be achieved and provide a timetable to show how they are to be achieved and maintained, taking into account: a) the best practice environmental management for the activity; and b) the risks of environmental harm potentially caused by the activity.	Precisely how the measures will be implemented must be defined. Responsibility for the implementation of the measures, together with a schedule of construction phases involving the activity, must be clearly stated.
5.4 The **EMP** shall state appropriate performance indicators, at intervals of not more than six months, for the duration of the program.	Performance indicators are clearly set criteria that identify whether or not the **EMP**, at the particular time, is attaining its goals.
5.5 The **EMP** shall make provisions for monitoring and reporting compliance with the program.	Monitoring programs will be site-specific because of differences in the environmental sensitivities of receiving environments and the future water quality objectives.
5.6 The **EMP** shall detail a contingency plan in the event that the proposed management measures fail to prevent environmental harm associated with the oxidation of acid sulphate soils, or if there is a change of management procedures resulting from site investigations and monitoring.	Contingency plans are important in the event of the failure of management measures. They represent an integral part of the **EMP**. Monitoring levels, outside agreed threshold values, would constitute failure of these procedures and would require remedial action. The plan shall detail alternative procedures to achieve the aims of the **EMP** and the nominated water quality objectives.
5.7 The **EMP** shall detail the water quality objectives to be achieved, following completion of the activity.	Future water quality objectives should be nominated for the site and any discharge from the site. Amongst other factors, these objectives will be determined by: a) the sensitivity of the receiving environment; b) future use of the waters; c) aquatic ecosystem maintenance and integrity; and d) future maintenance costs.

Attachment A

Dictionary

Administrative Authority – the organisation of government responsible for the administration and enforcement of the **Environmental Protection Act 1994**. The **Environmental Protection (Interim) Regulation** (**1995**) indicates whether the administering authority is Council or the Queensland Department of Environment.