

**Acid Sulfate Soil Management Plan
Altitude Aspire, Terranora
New South Wales**

Prepared for
Metricon Qld Pty Ltd

November 2010

Document control

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Client Reference:	Altitude Aspire	
Synopsis:	This management plan establishes responsibilities and procedures for the management of acid sulfate soils at Altitude Aspire Terranora Area E, NSW.	

Revision History

Revision #	Date	Edition By		Approved By	
1	4/2010	Phil Matthew		Neil Sutherland	Lindsay Varcoe
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Distribution

Distribution	Revision Number									
	1	2	3	4	5	6	7	8	9	10
Metricon Qld Pty Ltd	1	1								
Gilbert & Sutherland library and file	2	2								
Darryl Anderson Consulting Pty Ltd		CD								

Summary

Metricon Queensland Pty Ltd (Metricon) commissioned Gilbert & Sutherland Pty Ltd (G&S) to prepare an Acid Sulfate Soil Management Plan (ASSMP) for the disturbance of acid sulfate soils associated with the Altitude Aspire development at Terranora, New South Wales. The ASSMP is based on the Tweed shire LEP Acid Sulphate Constraints map and the Acid Sulfate Soils Management Advisory Committee (ASSMAC) Guidelines. This report has been prepared in response to the NSW Dept of Planning's Director General's Environmental Assessment Requirements (DGRs) for Project Application No. 09_0166, dated November 23, 2009, specifically DGRs 6.2 and 11.1 (in part), which read:

6.2. Identify the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, provide appropriate mitigation measures for the development's construction and operational stages. Identify the need for an Acid Sulfate Management Plan and prepare if necessary (prepared in accordance with ASSMAC Guidelines).

and

11.1 In accordance with the correspondence from the NSW office of Water (refer to attachment 4), provide an assessment of groundwater issues associated with the development, the location of the water table, nature and profile of the ground water regime, if any works will intercept the water table, any potential contamination issues, any proposed use of the groundwater resources, any associated impacts on registered bores, any works that may result in increased ground water discharge, impact on stability of potential acid sulphate soils in the vicinity, or affect groundwater dependant native vegetation, and any impacts on the quantity and quality of groundwater.

With respect to the Altitude Aspire site, ASS and PASS is potentially present in the area associated with the alluvial infill in the northern section of the site and adjacent to the SEPP 14 wetland (Terranora Broadwater). This area is identified as a Class 2 acid sulphate soil area, meaning that any works which are likely to lower the watertable will require an acid sulphate management plan (ASSMP). In addition, the Tweed Shire Area E Local Environment Study (LES)' identified any disturbance of land with an elevation below 5m Australian Height Datum (AHD) would require an acid sulphate soil management plan under the Acid Sulphate Soils Management Advisory Committee (ASSMAC) guideline.

The extent of the anticipated ASS and PASS is shown in Drawing No. GJ0901.8.2. The landward boundary of the ASS/PASS area is aligned with the 5m contour. The identified area will be subject to the provisions of this ASSMP. This includes the northern boundaries of stages 3, 9 and 10 where the Future Broadwater Parkway is proposed, and the gully between stages 6 and 7, where stormwater treatment measures (constructed wetland) are proposed.

Soils excavated from below 5mAHD in the identified areas will be tested in accordance with Table 2.2 of this ASSMP to determine appropriate liming rates. If necessary, soils will be treated in banded treatment pads to neutralise their acid generation potential (AGP). Treated material will be subject to validation testing in accordance with Table 2.3 of this ASSMP. Any groundwater movement related to plastic deformation of material underlying fill areas will also be monitored and treated as per recommended guidelines shown in ASSMAC, as part of the measures described in Table 2.5 of this ASSMP.

This ASSMP commits the proponent to specific strategies and measures for the identification, treatment and overall management of the site in accordance with best practice management of acid sulphate soil material. It establishes procedures to ensure that ASS and/or PASS encountered during road construction, services installation and stormwater device construction works are appropriately identified and treated in accordance with proven management techniques. This ASSMP establishes a clear management protocol incorporating operational policies, performance criteria, implementation strategies and corrective actions should they be necessary. The ASSMP identifies who is responsible for each specific aspect of ASS management using a working tabular format with provision for amendment if required.

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1) Introduction

Metricon Queensland Pty Ltd (Metricon) commissioned Gilbert & Sutherland Pty Ltd (G&S) to prepare an Acid Sulfate Soil Management Plan (ASSMP) for the bulk earthworks phase of the development of Altitude Aspire at Terranora, New South Wales. This report has been prepared in response to Environmental Assessment Requirements for Project Application No. 09_0166, specified by the Director General of the NSW Department of Planning, dated November 23, 2009. Area E in accordance with the concept plan. The site location is shown on Drawing No. GJ0901.8.1.

This plan addresses in part the following Director General's EARs:

11.1 In accordance with the correspondence from the NSW office of Water (refer to attachment 4), provide an assessment of groundwater issues associated with the development, the location of the water table, nature and profile of the ground water regime, if any works will intercept the water table, any potential contamination issues, any proposed use of the groundwater resources, any associated impacts on registered bores, any works that may result in increased ground water discharge, impact on stability of potential acid sulphate soils in the vicinity, or affect groundwater dependant native vegetation, and any impacts on the quantity and quality of groundwater.

And

6.2 Identify the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, provide appropriate mitigation measures for the development's construction and operational stages. Identify the need for an acid sulfate Management plan and prepare if necessary (prepared (sic) in accordance with ASSMAC Guidelines).

1.1 Background

No detailed acid sulphate investigations have been undertaken on the site. However, the area associated with the

alluvial infill in the northern section of the site and adjacent to the SEPP 14 wetland (Terranora broadwater) is identified as a Class 2 acid sulphate soil area. The implications of Class 2 land is that any works by which the watertable is likely to be lowered will require an acid sulfate management plan. In addition, the Tweed Shire Area E Local Environment Study (LES)¹ identified any disturbance of land with an elevation below 5m Australian Height Datum (AHD) would require an acid sulfate soil management plan under the Acid Sulfate Soils Management Advisory Committee (ASSMAC) Guidelines.²

The extent of the anticipated ASS and PASS is shown in Drawing No. GJ0901.8.2. The landward boundary of the ASS/PASS area is aligned with the 5m contour. The identified area will be subject to the provisions of this Acid Sulphate Management Plan.

The provisions proposed within this ASSMP for the identification, treatment and overall management of the site reflect best practice management of acid sulfate soil material.

1.2 Development activities affected

The proposed development has many construction and operational activities that may have an impact on the ground water and acid sulfate soils. However, the main activities that have been included in this preliminary assessment and management plan are earthworks associated with the construction of:

- roads
- infrastructure such as reticulated water supply and sewage
- stormwater drainage and management facilities.

1.3 ASSMP structure

This ASSMP acknowledges the potential environmental impacts associated with the proposed future disturbance of Acid Sulfate Soils (ASS) and Potential Acid sulfate soils (PASS) associated with the Altitude Aspire development at Terranora, NSW and details strategies to mitigate them.

¹ Parsons Brinckerhoff 2004 Tweed Area E Local Environmental Study Report No. 2136275A-RPT001Atc.

² Acid Sulfate Soils Management Advisory Committee (ASSMAC), 1998.

Each control strategy is based on proven environmental management methods and is presented as a commitment. The commitments made within this document will form the basis of future assessments, which will be made available to Tweed Shire Council for review.

The ASSMP is based on a series of tables for use during the earthworks phase of the proposed development. The person responsible for the implementation of the measures detailed is written on the table itself. The tables then detail the issue, the performance criteria, the implementation

strategy, monitoring, auditing, reporting, failure identification and the corrective action. The detachable pages within each section detail the provisions of the ASSMP.

An objective of the tabular format is to permit refinement of the management plan and allow the ASSMP to be a working document. If strategies need amendment, changes may be made to the individual tables after appropriate consultation with the statutory authorities. The format is presented on the following page for reference purposes.

Title #

Person responsible	This is the person who has accepted the responsibility of implementing the ASSMP provisions detailed on this page.
Issue	The issue with which the table deals.
Operational policy	The operational policy or management objective that applies to the element.
Performance criteria	Performance criteria (outcomes) for each element of the operation.
Implementation strategy	The strategies or tasks (to nominated operational design standards) that will be implemented to achieve the performance criteria.
Monitoring	The monitoring requirements which will measure actual performance (i.e. specified limits to pre-selected indicators of change).
Auditing	The auditing requirements, which will verify implementation of, agreed construction and operation phase environmental management strategies and compliance with agreed performance criteria.
Reporting	Content, timing and responsibility for reporting and auditing of monitoring results.
Identification of incident or failure	The circumstances under which the agreed performance criteria are unlikely to be met and environmental harm is likely to result.
Corrective action	The action to be implemented in case a performance requirement is not reached and the company(s) responsible for action.

Commitment #

What management has committed the company to.

1.4 General commitments

Commitment 1

The Developer undertakes to comply with the environmental implementation strategy as contained within the approved Acid Sulfate Management Plan (ASSMP).

Commitment 2

The Developer undertakes to fulfil all commitments made in this ASSMP and to carry out their activities on the project site in accordance with relevant current statutory requirements and approved amendments.

1.5 Definitions

In this ASSMP the terms have the following meanings;

- **ASSMP** means the approved Acid Sulfate Soil Management Plan and includes any amendments that may be approved from time to time.
- **POEO Act** means Protection of the Environment Operations Act 1997.
- **Development** means the development of the site as defined in a future development application.
- **DECCW** means the New South Wales Department of Environment and Climate Change and Water.
- **TSC** means Tweed Shire Council.
- **ASSMAC** means the Acid Sulfate Soils Management Advisory Committee.
- **Proponent** means the person undertaking the development of the land and includes the person nominated as having the responsibility for implementing the provisions of the ASSMP.



0 200 400 600 800 1000 1200 1400 1600 1800 2000
Scale of metres

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Data SIC

56 J 550269.8

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FIGURED DIMENSIONS TO
BE READ IN PREFERENCE
TO SCALING.

APPROVED

PROJECT
METRICON QLD PTY LTD
ALTITUDE ASPIRE, TERRANORA AREA E
SITE LOCATION
Source: Google Earth, 2010

SCALE AS SHOWN

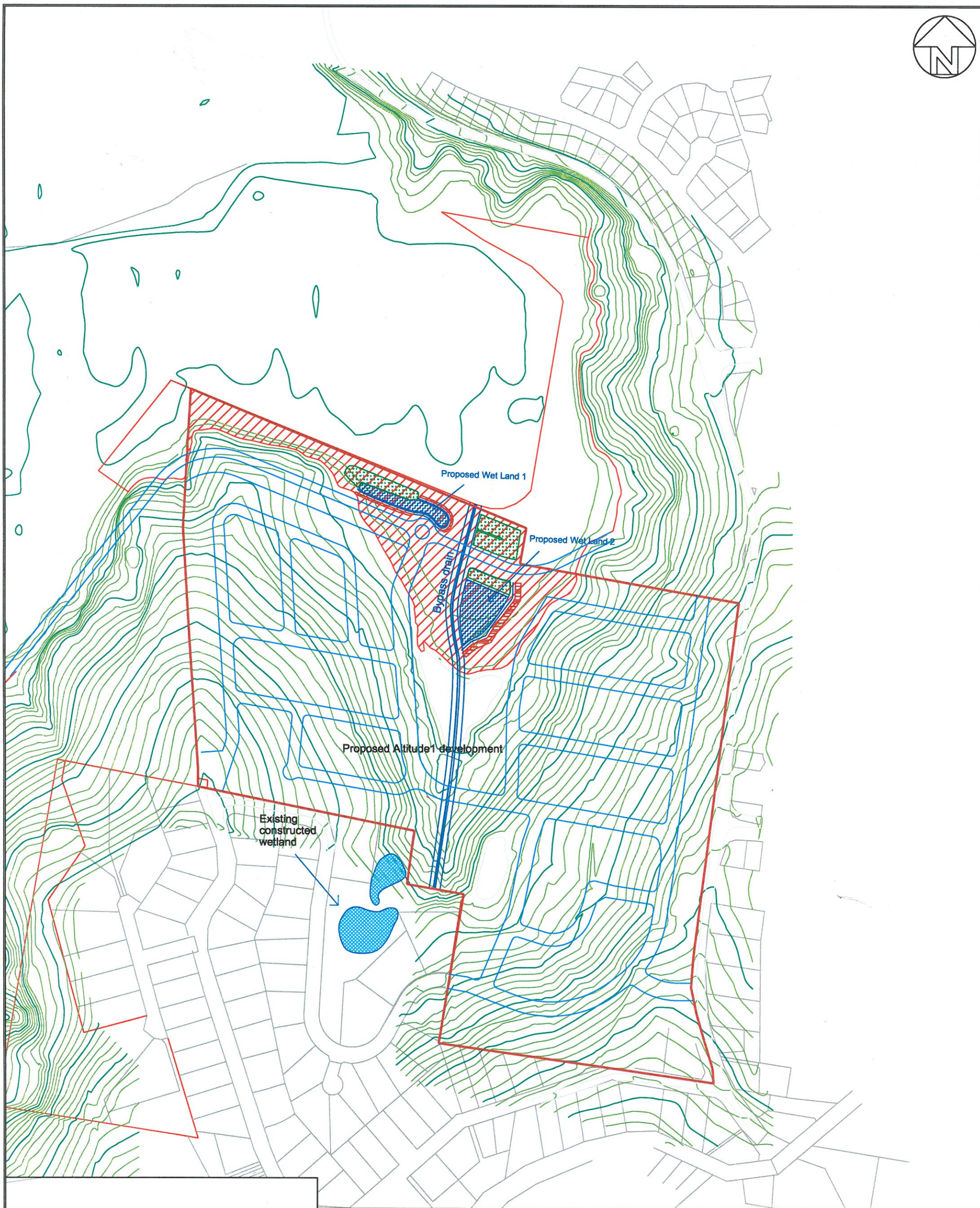
DRAWN J.J.T

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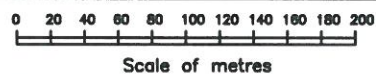
DATE 23/04/10

CHECKED

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- Proposed Altitude 1 development area subject to acid sulfate soil management (<5m AHD)
- Proposed wetland
- Existing waterbody
- Proposed vegetation treatment area
- Boundary of proposed Altitude 1 development
- 2m Contours



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BE READ IN PREFERENCE
TO SCALING.

APPROVED

PROJECT

METRICON QLD PTY LTD
ALTITUDE ASPIRE TERRANORA AREA E
AREA SUBJECT TO ACID SULFATE
SOIL MANAGEMENT

SCALE AS SHOWN

DRAWN J.J.T.

DRAWING No.

DATE 23/04/10

CHECKED

GJ0901.8.2

2) Management of potential impacts

2.1 Contractor management

Person responsible:	Consulting Engineer
Issue	Contractor management.
Operational policy	To verify the Proponent's duty of care is met by ensuring the contractor is aware of his/her responsibilities under the terms of the ASSMP.
Performance criteria	Each contractor is fully aware of his/her responsibilities under the terms of the ASSMP and their obligation to respond to environmental issues arising from construction activities.
Implementation strategy	Monitoring and verifying that the ASSMP is adhered to at all times and taking action if the specifications are not followed. The provision of advice, information and training to contractors and staff with regard to the implementation of the ASSMP.
Monitoring	Weekly site inspections are to be carried out by the site manager or Proponent's representative to ensure the provisions of the ASSMP are being adequately implemented.
Auditing	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the provisions outlined within the ASSMP.
Reporting	Full details shall be available to the contractor together with suggested corrective actions (if required).
Identification of incident or failure	Failure to comply with the conditions set out in the ASSMP resulting in environmental harm or unnecessary disturbance to neighbouring land users.
Corrective action	The Proponent has the right to call a halt to any activity being undertaken which is deemed in conflict with the ASSMP.

Commitment 3

All contractors will be managed to ensure compliance with the ASSMP for the duration of the site works.

2.2 Acid sulfate soil identification

Person responsible	Site Manager
Issue	Acid sulfate soil identification.
Operational policy	Identify actual and potential acid sulfate soils (AASS & PASS) and determine their acid producing potential and liming requirement prior to treatment.
Performance criteria	All ASS & PASS are appropriately identified prior to treatment.
Implementation strategy	All soils excavated from below the current surface level below 5m AHD for the construction of the development will be sampled according to the following protocol during excavation. Frequency – Any excavation conducted during the construction of the development below 5m AHD will require a minimum sampling rate of 1 soil sample for every 1000m³ of excavated material. Sample size - Soil samples of approximately 0.3kg each are to be collected from each soil horizon with a soil profile description recorded. Sampling - Soil samples to be tested on site or collected in sealed containers or plastic geological sampling bags that exclude air. Handling and storage – Samples are to be sent to laboratory or dried within 24 hours. Sample analysis method - All samples are to be analysed for Chromium Reducible Sulfur (CRS) (or equivalent method) and Titratable Actual Acidity (TAA) in accordance with the ASSMAC guidelines.
Monitoring	Laboratory analysis will employ the CRS/TAA Methods (or equivalent) as per the ASSMAC Guidelines. Material tracking should be undertaken by the site manager or environmental consultant. Records should be kept of volumes excavated, location of excavated material and acid sulfate soil testing frequency.
Auditing	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the provisions outlined within the ASSMP.

Reporting of monitoring results	Test results are to be forwarded to the Site Manager as they become available.
Identification of incident or failure	Insufficient sampling or failure to sample as identified by material tracking records and/or test results.
Corrective action	Ensure sufficient sampling and analysis of all excavated soils. Adjust sampling rates as necessary with consent from TSC.

Commitment 4

All soils excavated from below the current surface level <5m AHD and fill areas subject to >0.5 m filling will be tested for the presence of AASS and PASS during earthworks to determine appropriate liming rates.

2.3 Acid sulfate soil treatment

Person responsible	Site Manager
Issue	Acid sulfate soil assessment and treatment.
Operational policy	Excavated ASS will be treated to neutralise their acid generation potential (AGP).
Performance criteria	No material will be covered or removed from the site until validation tests indicate adequate neutralisation of the AGP.
Implementation strategy	Treatment of all excavated soil material is to be conducted in accordance with the provisions below. LIME TREATMENT. • Soils requiring treatment based on sample testing at the rate of one sample per 1,000m³ of excavated material (as described in Table 2.2 above) will be treated with lime or neutralising agent to neutralise their equivalent TPA or equivalent oxidisable sulfur concentrations. In calculating the amount of lime or neutralising agent to be added, a mixing factor for safety of 1.5 will be used. If it can be demonstrated that this safety factor is not needed, this may be reduced with the written agreement of TSC. • Excavated material will be placed within bunded fill areas. Bunded treatment areas should be situated taking into account the following considerations: • treatment pads are not to be located on public land • treatment pads are to be protected from upslope surface flows • sediment filters should be provided downslope of treatment areas. • Material will be placed in tracked lots <300mm and limed at the rate indicated by soil testing performed during excavation. Lime is to be mixed through the material with a rotary hoe or disc plough. • Subsequent fill layers (<300mm) will not be placed within the treatment pad (fill area) until validation results are obtained, indicating the complete neutralisation of the treated material. • Materials used to construct bunds will be free from acid sulfate soils with the bunded area prepared with surface lime at a rate of 5kg/m² of material to be placed. • Exposed sides and batters of water features are to be treated with lime immediately following excavation at a rate of 5kg/m².
Monitoring	Validation testing will be performed by assessing oxidisable sulfur (or equivalent method) sampled at the rate of one sample per 1,000m³ of treated material. Lime delivery dockets are to be retained and made available to the auditor. These dockets will be compared with required lime amounts

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Auditing	(as per calculated liming rates) as an indication as to whether liming has occurred at the specified rates.
	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the provisions outlined within the ASSMP.
Reporting of monitoring results	All validation testing results are to be reported to site manager. Records are to be kept on site and should be available for inspection at all times. Records are to be sent to TSC and/or DECC as required.
	Identification of incident or failure Examination of works for evidence of: • yellow efflorescence on soil surface • iron staining of soils or water • sulphurous odour • low pH in water bodies. The acceptance criteria for the placed materials will be: • If any single sample exceeds the ASSMAC Guideline threshold then the average of any four consecutive samples shall be equal to or less than the ASSMAC Guideline threshold for that material texture or should exhibit an equal or greater acid neutralising capacity.
Corrective action	• Retesting of fill materials using CRS/TAA method (or equivalent). • Any need for additional lime should be managed in accordance with the implementation strategies stated above. • If unforeseen environmental impacts occur due to excavation of acid sulfate soils (eg. fish kill) work should cease and TSC should be contacted.

Commitment 5

All AASS and PASS material shall be managed in accordance with the above provisions and the ASSMAC guidelines.

2.4 Surface water quality management

Person responsible	Contractor's Site Manager																
Issue	Surface water quality in the receiving environments surrounding the site including the Cobaki Creek will not be adversely impacted upon by site operations.																
Operational policy	No adverse impact to the receiving environment shall result from discharge of waters offsite.																
Performance criteria	Surface water quality in the Cobaki Creek not be adversely impacted by the development of the site. Where practicable, surface water quality in the receiving environment will be evaluated against the ANZECC (2000) guideline limits for the protection of aquatic ecosystems and/or background levels established for that site. Any surface water discharged from the site shall comply with the following release criteria: <table border="1"> <thead> <tr> <th>Water quality parameter</th><th>Release criteria</th><th>Criteria type</th></tr> </thead> <tbody> <tr> <td>pH</td><td>6.5 – 9.0</td><td>Range</td></tr> <tr> <td>Dissolved oxygen</td><td>>6.0mg/L</td><td>Minimum</td></tr> <tr> <td>Turbidity</td><td><50NTU</td><td>Maximum</td></tr> <tr> <td>Visible oil and grease</td><td>None visible</td><td>Visible</td></tr> </tbody> </table>		Water quality parameter	Release criteria	Criteria type	pH	6.5 – 9.0	Range	Dissolved oxygen	>6.0mg/L	Minimum	Turbidity	<50NTU	Maximum	Visible oil and grease	None visible	Visible
Water quality parameter	Release criteria	Criteria type															
pH	6.5 – 9.0	Range															
Dissolved oxygen	>6.0mg/L	Minimum															
Turbidity	<50NTU	Maximum															
Visible oil and grease	None visible	Visible															
Implementation strategy	- When constructed, surface water quality monitoring shall be undertaken within any water basin for pH, DO and turbidity prior to the release of any waters off site. - Existing surface water conditions shall be maintained outside the construction area. - When constructed, surface water flows will be directed towards the nearest water feature basin utilising a negative grade. Sediment and erosion control measures will be installed as detailed in Table 2.6. - Reliable <i>in situ</i> monitoring equipment will be used for all monitoring. This equipment will be calibrated prior to each round of monitoring.																
Monitoring	- Surface water quality monitoring within any water basins for pH, DO and turbidity to be conducted prior to the release of any waters off site. - Daily rainfall to be recorded by the civil contractor.																
Auditing	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant during the construction phase of the development. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the ASSMP.																

Reporting of monitoring results	• Water quality monitoring results to be submitted to TSC as requested. • All results to be kept on site for inspection by local and state government officers at all times.
Identification of incident or failure	• Discharge of waters offsite without appropriate testing to ensure the above water quality criteria are met. • Deterioration in surface water quality downstream of the development resulting from site works or the discharge of waters from the development site.
Corrective action	• Take necessary steps to address the problem to prevent a recurrence. • Addition of agents such as sodium hydroxide (caustic soda), magnesium hydroxide (magnesia), sodium bicarbonate, calcium bicarbonate (limestone) or calcium hydroxide (lime water) to contained waters as required to maintain the pH within the recommended range. • Addition of gypsum to contained waters as required to reduce suspended solids concentrations. • Discharge from any contained waters will not be allowed until the water quality criteria are reached.

Commitment 6

Management will ensure that any surface water discharged off site is acceptable under the ANZECC (2000) water quality criteria and/or background levels established for that site prior to release from the site.

2.5 Groundwater management

Person Responsible	Contractor's Site Manager													
Issue	Management of groundwater intercepted during the course of excavations.													
Operational policy	Management of groundwater intercepted during the course of excavations to minimise potential impacts to the receiving environment.													
Performance criteria	- No discharge offsite of groundwater intercepted during the excavation of water features without appropriate testing and treatment as required. - No variation in groundwater levels and/or flow direction beyond the effects of drought or flood.													
Implementation strategy	Groundwater intercepted during excavation shall be retained onsite until the water quality criteria (outlined below) are reached. Limiting of excavations in accordance with Table 2.3. No groundwater shall be discharged from the site until the specified water quality criteria are reached. Reliable in situ monitoring equipment will be used for all monitoring. This equipment will be calibrated prior to each round of monitoring.													
Monitoring	Groundwater encountered during excavations shall be pumped to a holding area monitored prior to release off site (if necessary) for the following parameters: <table border="1"> <thead> <tr> <th>Water quality parameter</th><th>Release criteria</th><th>Criteria type</th></tr> </thead> <tbody> <tr> <td>pH</td><td>6.5 – 9.0</td><td>Range</td></tr> <tr> <td>Dissolved oxygen</td><td>>6.0mg/L</td><td>Minimum</td></tr> <tr> <td>Turbidity</td><td><50NTU</td><td>Maximum</td></tr> </tbody> </table>		Water quality parameter	Release criteria	Criteria type	pH	6.5 – 9.0	Range	Dissolved oxygen	>6.0mg/L	Minimum	Turbidity	<50NTU	Maximum
Water quality parameter	Release criteria	Criteria type												
pH	6.5 – 9.0	Range												
Dissolved oxygen	>6.0mg/L	Minimum												
Turbidity	<50NTU	Maximum												
Auditing	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant during the construction phase of the development. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the ASSMP.													

Reporting of monitoring results	• Water quality monitoring results to be submitted to TSC as requested. • All results to be kept on site for inspection by local and state government officers at all times.
Identification of incident or failure	• Discharge of waters offsite without appropriate testing to ensure the above water quality criteria are met. • Deterioration in surface water quality downstream of the development resulting from discharge of waters from the development site. • Failure to implement the contingency plan if large volumes of groundwater are encountered during excavation.
Corrective action	• Take necessary steps to address the problem to prevent a recurrence. • Addition of hydrated lime to contained waters as required to maintain the pH within the recommended range. • Addition of gypsum to contained waters as required to reduce suspended solids concentrations. • Discharge of any contained waters will not be permitted until the water quality criteria are reached. • Implement groundwater contingency plan.

Commitment 7

Management will ensure that on-site activities do not impact upon groundwater quality, levels or movement outside of conditions experienced during drought or flood.

2.6 Sediment and erosion controls

Person Responsible	Consulting Engineer, Contractor's Site Manager
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Issue	Sediment and erosion control.
Operational policy	To prevent the displacement of sediment and acid sulfate soil material across the site, particularly during rainfall events.
Performance criteria	All excavated acid sulfate soil material shall be contained in such a manner so as to prevent the displacement of this material across the site. Erosion resulting from on-site activities shall be minimised. All waters shall be treated prior to release offsite to prevent the discharge of sediment laden waters into Cobaki Creek or surrounding environments. The transport and accumulation of sediment offsite and should be prevented.
Implementation strategy	Erosion and sediment control devices such as (but not limited to) silt fences, bunds and contour drains should be installed prior to commencement of site activities to the reasonable satisfaction of TSC and should be maintained throughout the life of site operations. All exposed areas should have a negative grade toward the onsite excavations (water feature basins). All excavated material will be placed within bunded areas and tested for acid sulfate soil potential. Materials used to construct bunds will be free from acid sulfate soils with the bunded area prepared with surface lime at a rate of 5kg/m² of material to be placed. Upslope runoff shall be diverted around any acid sulfate treatment areas or any cleared or disturbed regions of the site in a way that minimises erosion, the size of the upslope catchment and diverts waters to the onsite water feature basins. Runoff from acid sulfate soil treatment areas or stockpiled material shall be directed to the nearest water treatment basin. Accumulated water shall undergo testing and treatment as per Table 2.4 prior to release from site. Sediment control fences should be constructed at the downslope perimeter of acid sulfate soil treatment areas and any cleared or disturbed regions of the site. Where possible, the excavation/construction programme shall be scheduled to minimise the potential for soil loss to occur. Where excavation/construction activities cannot be altered, additional controls shall be implemented in the areas of high erosion potential. All erosion and sediment control measures should be maintained at operational capacity until disturbed land is effectively rehabilitated.

	Stripped topsoil shall be separated from subsoil materials and shall only be stripped from the areas designated on the appropriate plans. After undergoing any necessary acid sulfate soil treatment, soil should be stockpiled taking into account the following considerations: • stockpiles are not to be located on roads, road shoulders or any other public land • stockpiles to be protected from upslope surface flows • sediment filters should be provided downslope of stockpiles • all stockpiles should be seeded within a fortnight of final forming with an appropriate seed mix.
Monitoring	Monthly visual inspections will be undertaken to ensure adequate erosion and sedimentation control devices are installed particularly in acid sulfate soil treatment areas.
Auditing	Auditing will be undertaken by the site manager and/or the proponent's nominated representative. Alternatively, auditing may be carried out by an independent consultant during the construction phase of the development. The audit should include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the ASSMP.
Reporting	Reporting is required if excessive sedimentation and/or erosion is identified. Full details to be available to the contractor together with suggested corrective actions if required.
Identification of incident or failure	• Displacement of acid sulfate soil material across the site. • Inadequate bunding of acid sulfate soil treatment areas. • Damaged or failed erosion and sediment control devices.
Corrective action	Identify the source of the problem and take the necessary steps required to prevent a recurrence. This may include: • the installation of additional erosion and sediment control measures • maintenance of existing controls • a review of work practices to minimise exposed areas and the duration of exposure.

Commitment 8

The Developer will ensure that appropriate and adequate erosion and sediment control measures are installed prior to the commencement of works and are maintained for the duration of the construction works.

3) Administration of the ASSMP

3.1 Amendment of the ASSMP

The Developer may make an application to TSC to amend the provisions of this ASSMP. The application shall:

1. be in writing
2. specify the provisions of the ASSMP to which the application relates
3. state how the proposed amendments achieve the objectives of the provisions to which the amendments relate.

TSC shall approve the amendment where TSC is satisfied acting reasonably that the proposed amendments achieve the objective of the provisions to which the amendment relates.

3.2 Incident management

The Developer and any person appointed by the Developer as having responsibility for a control strategy set out in this ASSMP have clearly defined responsibilities under the *POEO Act 1997* to report any incidents likely to cause material or serious environmental harm.