Appendix E

ASS management plan

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Acid Sulfate Soil Management Plan
Jilalan Rail Yard Upgrade Project
Coal Stream Alliance - Jilalan

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Contents

1. Introduction

1.1 Background

Review of topographical survey information indicated that parts of the Plane Creek floodplain at the northern extent of the project area were at and below 5 m Australian Height Datum (AHD) and therefore the SPP 2/02 applies as indicated in Figure 2.1 (Connell Hatch Soil and Acid Sulfate Soil Investigation 2007). The ASS investigation was undertaken between August and November 2007.

Proposed works in this area include:

- Construction of rail embankment and infrastructure
- Installation of surface drainage measures at the base of embankments and roadside drainage
- Maintenance and resurfacing works at the Smyths Road crossing of Plane Creek
- Filling of part of an existing surface drainage line adjacent to existing rail embankment
- Construction of the Smyths Road underpass
- Realignment of Smyths Road between the level crossing and the Plane Creek crossing

The results of the Acid Sulfate Soil (ASS) investigation (Connell Hatch 2007) indicated that ASS material was present within the project area in the form of Potential Acid Sulfate Soil (PASS) material within part of the Plane Creek floodplain in the northern extent of the project area within sampling locations ASS 3 and ASS4 as illustrated in Figure 2.2 (Connell Hatch Soil and Acid Sulfate Soil Investigation 2007). The PASS material identified was located at depth within the sampling profiles at approximately 1 m AHD (4 m bgl) and -0.5 m AHD (5.5 m bgl), respectively.

The intent of this Acid Sulfate Soil Management Plan (ASSMP) is to minimise the potential for environmental impacts to occur as a result of the disturbance of Acid Sulfate Soils (actual and potential) material during the construction works phase of the Jilalan Rail Yard Upgrade Project (JRYUP) development. This ASSMP is based on ASS investigation results.

The management measures and strategies outlined in this ASSMP have been developed with consideration of the *Queensland Acid Sulfate Soil Technical Manual Soil Management Guidelines* Version 3.8 (Dear S.E., *et al* 2002) as developed by the Department of Natural Resources and Mines.

1.2 Objectives

The objectives of ASS management on the JRYUP site are to:

- Identify areas of likely disturbance
- To identify and locate ASS prior to excavation in order to minimise disturbance of these soils, develop adequate management procedures and prevent impacts to the surrounding environment resulting from exposure of ASS to the atmosphere, groundwater and surface runoff
- To provide the minimum requirements for the development of a Construction ASSMP to be implemented in order to address site ASS management during construction

1.3 Statutory provisions

The Queensland legislation and regulation for ASS management include the following:

- *Environmental Protection Act 1994*
- State Planning Policy 2/02 Planning and Managing Development Involving Acid Sulfate Soils

The ASSMP has been developed in accordance with the following guidelines:

- *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998* (Ahern C R et al 1998)

- *Acid Sulfate Soils Laboratory Methods Guidelines* (Ahern C R et al 2004)
- *Queensland Acid Sulfate Soil Technical Manual Soil Management Guidelines* Version 3.8 (Dear S.E., et al 2002)
- *State Planning Policy Guideline Acid Sulfate Soils* (Queensland Government 2002)

1.4 Performance criteria

- No impacts to surface water or groundwater quality resulting from the disturbance, storage, treatment or reuse of ASS material
- Stockpile and excavation leachate pH range to be recorded between 6.5 and 8.5 prior to release to site stormwater system
- ASS material spills to be cleaned and/or neutralised within 12 hours of occurring
- Where ASS disturbance occurs, implement appropriate management measures to mitigate potential impacts
- Implementation of the recommendations of the geotechnical, groundwater, environmental and ASS investigations
- Containment of ASS material stockpile and treatment areas (if required)
- Validation sampling for treated ASS material to be completed at a rate of 1 sample/500 m^3 or at a rate agreed in consultation with DNRW and the EPA for all material excavated from areas identified as containing ASS prior to placement for reuse, stockpiling and/or removal offsite

2. Impact management actions and responsibilities

Impact management actions for ASS management are summarised in Table 2.1 for design and construction of the JRYUP. All actions are subject to review by the Superintendent to monitor that tasks are being performed in accordance with the relevant statutory provisions.

Table 2.1 ASS Management – Impact management actions

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
Design	Avoid/minimise excavation below 5 m AHD and in ASS risk areas, where practicable through the application of appropriate design principles	DD	As per detailed design drawings	Detailed Design Phase	S
	Site drainage is installed in accordance with the relevant design specifications	DD	As per detailed design drawings	Detailed Design Phase	S
	Adequate management measures for the material being disturbed shall be specified in design and specification documentation and any potentially contaminated waters will be considered during the development of a Construction Environmental Management Plan (CEMP) and will comply with the general environmental duty	DD	As per detailed design drawings	Detailed Design Phase	S
	Release points and monitoring locations for the release of treated leachate and runoff will be identified prior to the commencement of works	DD	As per detailed design drawings	Detailed Design Phase	S
	Identify suitable locations for stockpile and ASS treatment areas. Proposed ASS stockpile and treatment areas must be located a minimum distance of 30 m from surface watercourses, wetlands/lagoons and tidal areas or designed to ensure that hydraulic isolation of these areas is achieved for a 1 year (24 hr) ARI event	DD	As per detailed design drawings	Detailed Design Phase	S
	Stockpile areas for the storage of fine agricultural lime material will be designed and suitably located onsite to ensure that neutralisation of spills and runoff can be implemented immediately after occurrence and/or after rainfall, respectively	DD	As per detailed design drawings	Detailed Design Phase	S
	Develop a schedule for staging works and minimising areas of disturbance	DD	As per detailed design drawings	Detailed Design Phase	S
	Design and stage filling and reclamation activities in accordance with the recommendations of the geotechnical investigations to minimise subsurface disturbance of ASS resulting from settlement and surcharging	DD	As per detailed design drawings	Detailed Design Phase	S
	Review the site ASS investigation results and the ASSMP and implement a procedure for nominated site contractors to develop suitable procedures for specific site works activities	CEO	CL	PreC	CPM

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
	Review the site ASS investigation results and the ASSMP and mark potential ASS risk areas on site plans and drawings	CEO	VI	PreC	CPM
	A leachate monitoring programme shall be developed and implemented, as part of the contingency measures for the site, by the Coal Stream Alliance – Jilalan (CSAJ) and submitted to the Superintendent for approval prior to the commencement of site works	CEO	VI and approval of monitoring programme	PreC	S
	The leachate monitoring programme will include the following principles: • Sampling of leachate treated insitu within excavation voids and from spills to ensure effectiveness of neutralisation is achieved prior to release offsite or to the site stormwater system • Leachate will be sampled and analysed prior to scheduled discharge events and the leachate quality will comply with acceptable stormwater quality parameters prior to release • Leachate monitoring results will be reported to the Superintendent as required • An incident reporting procedure will be implemented by the CSAJ to ensure that leachate spills and unplanned discharges are recorded, investigated, remediated (if required) and protective measures implemented to prevent/reduce the risk of recurrence of the incident	CEO	VI and approval of monitoring programme	PreC	S
Construction	Trench voids excavated into ASS affected material should be backfilled within 12 hours of excavation where practicable with a combination of ASS free fill material and fine agricultural lime (fine aglime)	CPM	VI and MER	PD	CEO
	Locations suitable for the treatment and/or storage of ASS material during construction will be identified and appropriately prepared (clay lined and bunded) prior to the commencement of works involving the disturbance of ASS material	CPM	As per detailed design drawings	PreC	CEO
	Routinely inspect surface waters and stormwater drainage in the vicinity of the site for evidence of impacts resulting from disturbance of ASS (ie fish kill, aquatic/riparian flora mortality and/or iron staining) during construction	CEO	VI and CL	Weekly	CPM
	Minimise disturbance of surface and subsurface soils onsite where practicable	CPM	VI	WR	CEO
	Segregate soil and sediment excavated from areas identified as ASS areas for validation and/or treatment	CPM	VI and CL	WR	CEO

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
	Develop and implement a soil field screening procedures for validation sampling of soil and sediment excavated onsite at a rate of 1 sample/500 m^3 or at a rate agreed in consultation with DNRW and the EPA	CEO	VI, CL, Sample, Analyse and Report	WR	CPM
	Where ASS treatment is required for excavated material, treatment shall include, but not be limited to the following measures: • Separation of the ASS into treatment stockpiles • Placement of the material within a lined and bunded treatment area • Broad spreading of ASS material for treatment • Addition of the required quantity of fine aglime • Periodic mixing and addition of fine aglime (as required) • Capture leachate, monitor the pH levels are between 6.5 and 8.5 prior to release • Develop and implement a suitable sampling programme to verify that ASS neutralisation treatment has been effective prior to reuse of the material	CEO	VI that treatment procedures have been implemented	PreC	CPM
	Sample and analyse soil and sediment segregated for validation and/or treatment for ASS	CEO	Sample, Analyse and Report	WR	CPM
	Capture, analyse and treat (if necessary) runoff from the designated ASS treatment areas and record results	CPM	VI, CL, Sample, Analyse and Report	WR	CEO
	Release runoff from designated ASS treatment areas when pH monitoring results are within 6.5 to 8.5 pH range	CPM	VI, CL, Sample, Analyse and Report	WR	CEO
	Record the incidence and location of identified ASS areas in the site hazard log and update the log if ASS are encountered during disturbance activities and mark areas across the site and restrict access to these areas by both foot and vehicular traffic	CEO	VI	WR	CPM
	Provide training for site personnel to ensure that safe handling practices and procedures are implemented for the handling and treatment of ASS and aglime neutralising agent	CPM	CL	As part of the site induction	CEO

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
	Retain and update personnel training records relating to safe handling of ASS	CPM	VI	As required	CEO
	Routinely inspect designated ASS treatment areas. ASS treatment areas shall have a continuous impermeable clay lining and adequate bunding and sedimentation traps to collect runoff solids and contain runoff	CPM	VI and CL	Weekly and after rainfall	CEO
	Maintain clay lining, lime guard layers, bunding and containment capacity of the designated ASS treatment and stockpiling areas	CPM	VI and CL	WR	CEO
	Generate an incident record in the event that an impact is identified in groundwater and adjacent waterways (ie fish kill, aquatic/riparian flora mortality and iron staining)	CEO	VI, CL and keep incident records on file	WR	CPM
	Generate an incident record in the event that a spill of ASS material occurs outside the ASS storage and/or treatment areas.	CEO	VI, CL and keep incident records on file	WR	CPM
	Implement spill clean up procedures for cleaning and neutralising the area affected by the spill within 12 hours of the incident	CPM	VI, CL and keep incident records on file	WR	CEO
	Prevent the uncontrolled release of runoff from ASS treatment areas and soil disturbance areas from entering/impacting adjacent surface waters (including fresh and brackish waters and tidal marine and estuarine waters)	CPM	VI and CL	Weekly and after rainfall	CEO
	Develop and implement specific ASS management practices and procedures, which incorporate the following principles, where appropriate: • Minimisation of disturbance • Neutralisation • Hydraulic separation • Strategic reburial	CPM	VI of procedures and their implementation	PD	S
	Refill excavated voids that are no longer required for site works as soon as practicable after excavation or within 12 hours after excavation	CPM	VI and CL	WR	CEO
	Prevent public access to excavation, stockpile and ASS treatment areas	CPM	VI	Daily	CEO
	Ensure all personnel involved in identifying and handling ASS are appropriately trained and possess/use appropriate PPE as required	CPM	VI	WR	CEO

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
	Visually monitor soil and sediment excavated from site for signs of the presence of ASS	CEO	VI	WR	CPM
	Generate an incident record in the event that personal injury and/or plant and equipment damage occurs as a result of disturbing ASS	AS	Incident Record Form	WR	CEO
	Install a plant and equipment wash down bay for each stage of site works, which is lined and bunded to sufficiently contain runoff for analysis and treatment (if necessary)	CPM	VI	WR	CEO
	Wash down all plant and equipment involved in excavation of soil and sediment from site and capture, monitor and treat (if necessary) and wash down runoff and solids	AS	VI	As required	CEO
	Collect solids captured in sediment traps from equipment wash down and ASS treatment areas and treat as high risk ASS material unless validated as ASS free material.	CPM	Sample, Analyse and Report	WR	CEO
	Complete field screening and sample analysis in line with site ASS validation procedure	CEO	Sample, Analyse and Report	WR	CPM
	Restrict the number of plant and equipment utilised for handling soil and sediment excavated from site and identify in a plant and equipment log	CPM	VI and check Log	WR	CEO
	Routinely inspect and maintain plant and equipment used for handling surface and subsurface soil excavated onsite in safe operational condition	CPM	VI and CL	In accordance with vehicle maintenance schedules	CEO
	Routinely check stockpile and treatment areas for adequate containment integrity and capture of runoff during active periods	CEO	VI and CL	Daily while active	CPM
	Routinely inspect drainage control measures associated with ASS management and maintain/repair as required during active periods	CEO	VI and CL	Daily while active	CPM

Phases	Actions	Responsibilities	Monitoring and Reporting Compliance		
			Activity	Activity Timing	Activity Performed By
	Routinely inspect areas of known ASS disturbance for indications of acid leachate generation from commencement of site works until reinstatement of the area	CEO	VI andCL	Daily while active	CPM

Table Notes

S Superintendent
CPM Contractor Project Manager
CEO Contractor Environmental Officer
DD Detailed Designer
AS All Staff

VI Visual Inspection
CL Checklist is to be completed
MER Monthly Environmental Report

PreC Pre Construction
PstC Post Construction
PD Project Duration (Construction)
NA Not Applicable
WR When Required

2.1 Corrective Actions

During site works the Contractor will be responsible for ensuring that sufficient fine aglime is located/stored onsite at all times (minimum 1t) for the purpose of neutralisation of spills and/or leachate that may occur.

In the event of an incident relating to the release of acid leachate, runoff or sediment occurring, the area must be identified and hydraulically isolated using suitable control measures. The runoff/sediment is to be treated with an adequate amount of fine agricultural lime and samples analysed for pH prior to release.

All nonconformances will be corrected as soon as practicable, reported and strategies implemented to reduce the likelihood of the incident recurring.

2.2 Reporting requirements

A leachate monitoring programme will be developed and implemented, as part of the contingency measures for the site, by the Coal Stream Alliance – Jilalan (CSAJ) and submitted to the Superintendent for approval prior to the commencement of site works. The monitoring programme will include the following principles:

- Sampling of leachate treated insitu within excavation voids and from spills to ensure effectiveness of neutralisation is achieved prior to release offsite or to the site stormwater system
- Leachate will be sampled and analysed prior to scheduled discharge events and the leachate quality will comply with acceptable stormwater quality parameters prior to release
- Leachate monitoring results will be reported to the Superintendent, as required
- An incident reporting procedure will be implemented by the Contractor to ensure that leachate spills/discharges are recorded, investigated, remediated (if required) and protective measures implemented to prevent/reduce the risk of recurrence of the incident

The Contractor will be responsible for developing and implementing a validation sampling programme for treated ASS material prior to reuse onsite. The validation sampling programme will also be implemented for fill material imported from offsite that does not have a certificate as being ASS free material provided by the quarry or supply contractor.

Samples for validation will be collected at a rate agreed in consultation with DNRW and the EPA. Analysis of validation samples will include as a minimum:

- Field characterisation;
- Field pH_F and pH_{FOX} screening; and
- SPOCAS and/or Chromium Suite analysis for selected samples by a laboratory that is NATA accredited for the analysis.

Validation sampling results will be reported to the Superintendent by the Contractor within the reporting period following the receipt of the laboratory results.

ASS treated material will be scheduled for removal from the ASS treatment area and identified for reuse and/or stockpiling onsite as ASS free fill by the Superintendent once the laboratory results for the validation samples have been received and approved. The effectiveness of neutralisation of the treated material will be assessed as satisfactory by the Superintendent prior to scheduling removal of the material from the designated treatment area.