

SP7. SOIL AND WATER MANAGEMENT PLAN

CROOKWELL II WIND FARM

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1. OBJECTIVES

This Soil and Water Management Plan aims to:

- Control sediment and erosion to an acceptable level
- Prevent erosion from developing as a result of construction
- Prevent dirty water discharges to the Wollondilly River catchment

The management plan will be revised following the completion of construction to ongoing suitability for operational purposes.

2. REQUIREMENTS

This Soil and Water Management Plan has been prepared in accordance with Consent Condition 84, 85, 89, 90 and 91.

Soil and Water Management

(84) ³⁴Prior to commencement of construction and operation, a Soil and Water Management Plan must be prepared and implemented in consultation with the SCA and DEC, in accordance with Landcom's guideline Managing Urban Stormwater: Soils and Construction and the RTA's Guideline for the Control of Erosion and Sedimentation in Roadworks. The Plan is to outline soil and water management measures to be implemented during construction and operation to minimise impacts to soil and vegetation, including but not limited to:

- (a) water quality safeguards to be implemented, as outlined in Chapter 9 and Table 21-2 of the EIS;*
- (b) practices to manage soil and water where tracks and electrical cables cross water courses and drainage depressions;*
- (c) inspection, maintenance and monitoring programs; and*
- (d) practices proposed to be used in the event of accidental spills.*

(85) ³⁵An Erosion and Sediment Control Plan must be prepared and implemented in consultation with the Department. The Plan is to outline the design of storm water outlets and scour protection works to be utilised during construction and be developed in accordance with the Department's guideline Stormwater Outlet Structures to Streams (for pipes, culverts, drains and spillways) Version 1. The plan must include, but not be limited to:

- (a) representative survey cross sections and a long section showing the existing and proposed bed and bank profile and water levels at the outlet points;*
- (b) design of scour protection works based on predicted velocities, scour potential and associated methods of construction;*
- (c) details of a monitoring program to ensure effectiveness; and*

(d) *details of decommissioning.*

(89) *Waterways crossing associated with the development are to be designed and constructed in accordance with NSW Fisheries' Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (2004) and Policy and Guidelines for Fish Friendly Waterway Crossings (2004).*

(90) ³⁹*All works associated with the development are to be monitored after each major storm event during construction. Necessary stabilisation works are to be undertaken if there are any signs of erosion or instability of protected waters, to the satisfaction of the Director General.*

(91) ⁴⁰*Except as may be expressly provided by a licence under the POEO Act in relation to the development, the Applicant must comply with Section 120 of the POEO Act (prohibition of the pollution of waters), which prohibits pollution of waters.*

³⁴Incorporates Department of Environment and Conservation General Terms of Approval O3.1

³⁵Incorporate DIPNR General Terms of Approval 12, 13, 14, 19, 40, 43

³⁹Incorporate DIPNR General Terms of Approval 19

⁴⁰Incorporate Department of Environment and Conservation General Terms of Approval L1.1

3. MANAGEMENT PLAN

3.1 General Management Methods

The following mitigation measures would be implemented during construction:

- construction would be packaged and staged so that open surfaces, subject to ongoing work, could be minimised, rehabilitated and stabilised as soon as possible after completion.
- Erosion and sediment control plans would be prepared by suitably qualified persons prior to any construction ground disturbance occurring. Plans would contain
 - Requirements for silt fencing and the location or diversion drains
 - The direction of flow across the site
 - The maintenance requirements for the controls
 - Dewatering procedures where sumps and ponds are to be constructed
 - Any monitoring requirements
 - A description, reference or diagram showing the proposed method of construction of each control to be installed
- road designs would include appropriate flow dissipaters to minimise the concentration of flows from the road surface (ie. maintaining a discharge rate that would not cause erosion down-slope). The designs

would incorporate the best management practice techniques as outlined in relevant guidelines from DLWC (Guidelines for the Planning, Construction and Maintenance of Tracks, 1994), RTA (Road Design Guide, 1988-on), and State Forests (Draft Forest Practice Codes, 2004) ;

- creek / drainage line crossings would be designed to incorporate best management practice techniques including consideration of the NSW Fisheries Fish Passage Requirements for Waterway Crossings (2003);
- construction would take place in dry conditions, where possible;
- minimise on-site vehicle activity on disturbed surfaces during and after wet weather events;
- construction of earth bunds and similar diversion drains around the perimeter of each construction zone and excavations at each turbine site, where appropriate and practical, to prevent surface water entering these areas;
- minimising stockpiling by coordinating excavation, spreading, regrading, compaction and importation activities;
- where stockpiles are required, silt fencing would be placed around stockpiles such that sediment does not spill on the road or pavement, is not placed in drainage lines, depressions or watercourses; and cannot be washed onto or in roadways, drainage lines, depressions or watercourses;
- covering/vegetating stockpiles where material is to remain on site for periods of longer than 3 months.
- installing temporary erosion and sediment control structures such as staked straw bales and silt fences to prevent the movement of sediment away from stockpiles and construction areas;
- weekly inspection of erosion control structures and banded areas, particularly after any rainfall event;
- restricting traffic to defined access tracks and construction impact areas;
- washing or removing mud from the wheels and undercarriage of vehicles prior to departure from the site during wet weather;
- revegetating surfaces as soon as possible to prevent exposure for extended periods;
- weekly inspections of the areas surrounding construction sites, and all access tracks to ensure no erosion features are developing.

3.2 Construction Vehicle Management

Potential contamination from construction and operational vehicles would be minimised through:

- decontamination of plant and equipment prior to leaving the construction site;
- removing accidental spills of soil or other material;
- appropriate and timely disposal of any contaminated spoil, water or waste generated during construction;
- bunding of the designated refuelling area. Designated refuelling areas would be located greater than 100 metres from the nearest drainage depression;
- spill kits provided on site to contain potential spills from equipment;
- Refuelling would be restricted to areas equipped with spill containment; and
- development and implementation of an emergency response plan in the event of an accidental fuel or oil spill including mitigation measures should the spill not be able to be contained on site.

3.3 Wastewater Management

Portable toilet facilities would be provided during the construction phase. Management of these facilities would include:

- use of a licenced supply and disposal contractor to manage and dispose of all wastewater; and
- all facilities to be located a minimum of 100 metres from any permanent creek or river and 40 metres from any drainage depression.

Table 9-3 Hydrology: Summary of Mitigation Measures

Safeguard	Implementation			
	Design	Preparation	Construction	Operation
Staged construction to minimise open surfaces subject of ongoing work, and enable rehabilitation and stabilisation as soon as possible.	✓		✓	
Track designs, based on relevant guidelines from DLWC, State Forests and RTA, to be best practice and minimise potential erosion and sedimentation.	✓		✓	✓
Creek/ drainage line crossings to be constructed in accordance with best management techniques, based on NSW Fisheries guidelines	✓		✓	✓
All construction works in drainage lines to occur during dry periods, whenever possible			✓	
All other construction to occur when possible in dry conditions.			✓	
Minimal on-site vehicle use during and after wet weather events.			✓	✓
Traffic to be restricted to defined access tracks, construction impact areas, and operational areas.			✓	✓
Decontamination of plant equipment prior to leaving the site.			✓	
Construction of bunds around construction and excavation areas, and at tree removal sites.		✓	✓	
Minimise stockpiling, and implement management measures such as silt fencing, vegetation / covering where stockpiling is required.			✓	
Installation of temporary erosion and sediment control structures to prevent movement of sediment away from stockpiles and construction	✓	✓	✓	

Safeguard	Implementation			
	Design	Preparation	Construction	Operation
areas, to be constructed down slope of all affected sites. All structures to be designed in accordance with the Landcom's manual, <i>Managing Urban Stormwater: Soils and Construction</i> , 2004, and other relevant guidelines from DLWC and RTA.				
Regular inspection of erosion control structures and bunded areas.			✓	✓
Revegetation of the disturbed areas of site as soon as possible.			✓	
Regular inspections of areas surrounding turbine sites, substation and all access tracks to ensure no erosion features are forming.			✓	✓
Development of an action plan as part of the inspection program and SWMP.		✓	✓	
Timely and appropriate disposal of accidental spills and any contaminated spoil, water or waste generated.			✓	✓
Bunding of designated refuelling areas, which are to be located at least 100m from the nearest drainage line.			✓	
Spill kits are to be provided on site, for both construction and operation phases, and refuelling will only be allowed in areas where kits exist.		✓	✓	✓
Use of a licensed disposal contractor to manage and dispose of all wastewater generated in temporary sanitary facilities. All facilities are to be located at least 100m from any permanent creek or river and 40m from any drainage depression.		✓	✓	
Regular inspection of the track network and drainage line crossings to ensure no erosion features are developing, particularly after any rainfall event.				✓
Regular inspection / maintenance of all rehabilitation work sites to ensure that revegetation has been established as planned and that no erosion features have developed.				✓
Development of an action plan as part of the inspection program and the broader Soil and Water Management Plan which would be initiated in the event that a gully erosion feature is identified during a regular inspection.		✓	✓	✓

Safeguard	Implementation			
	Design	Preparation	Construction	Operation
Development and implementation of an emergency response plan in the event of an accidental fuel, oil, or other material spill including mitigation measures should the spill not be able to be contained on site.		✓	✓	✓
Selection of a propriety wastewater treatment system which does not allow any external release of effluent.	✓			✓
Selection of an oil-water separator, using latest best practice in the industry, based on Energy Australia and TransGrid practices.	✓			✓
Final selection of locations for wastewater treatment plant and oil / water separator to be a minimum of 100 metres from any permanent creek or river and 40 metres from any drainage depression.	✓			✓
Installation of dedicated material storage area in facilities building, to provide containment for any spills during maintenance activities.	✓			✓
Ensure any discharge of stormwater from the transformer bund in the substation is at low velocities sufficient not to cause erosion down-slope of the site.				✓
Establish a maintenance agreement with a licenced contractor (certified to ISO14000 standard requirements) to ensure the treatment systems meet design specifications.	✓			✓
Development of an emergency response plan in the event of an accidental failure of treatment systems.	✓			✓

3.4 Performance Monitoring

Regular inspections by site foreman and the PQEMR will be undertaken to monitor the following performance indicators:

- No sediment plumes beyond sediment fences existing within 5 days of rainfall events;
- Controls installed as per ESCP's;
- No additional scours developed as a result of construction;
- No water pollution in the Wollondilly River as a result of construction;

3.5 Storm Event Monitoring

Following each major storm event during the construction period, an inspection by the site foreman and the PQEMR will be undertaken to monitor all works associated with the development and to initiate necessary stabilisation works if there are any signs of erosion or instability of protected water.

3.6 Spill Response

Spills will be handled in accordance with Spill Response Flowchart in Appendix 2;