

Southern Sydney Freight Line

Erosion and Sediment Control Sub-Plan

January 2009



Connell Wagner

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Details of Revision Amendment

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8	23/10/08	Post DoP comments	NH	NH		
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5	29/4/08	Final Draft	NH	NH		
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1. Introduction

1.1 Purpose and objectives

The Erosion and Sediment Control Sub Plan (ESCSP) has been prepared by ARTC to identify measures for managing the potential impacts from erosion and sedimentation due to construction of the Southern Sydney Freight Line (SSFL).

This ESCSP specifically addresses the requirements of SoC 49 and SoC 50:

An Erosion and Sedimentation Control Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with Relevant Government Departments and Relevant Councils. The Sub Plan will:

- a. where relevant, be consistent with the Landcom's (2004) guideline "Managing Urban Stormwater - Soils and Construction", the RTA's "Guidelines for the Control of Erosion and Sedimentation in Roadworks" and the Department of Natural Resource's (1998) "Constructed Wetlands Manual";*
- b. identify the Construction activities that could cause soil erosion or discharge sediment or water pollutants from the site;*
- c. describe management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including a strategy to minimise the area of bare surfaces during Construction;*
- d. describe the location and capacity of erosion and sediment control measures;*
- e. identify the timing and conditions under which Construction stage controls will be decommissioned;*
- f. include contingency plans to be implemented for events such as fuel spills;*
- g. identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated; and*
- h. include the general erosion and sedimentation management and mitigation measures contained in Section 12.3.1 of Volume 1 of the Environmental Assessment.*

An appropriately qualified soil scientist will be consulted according to a schedule identified in the Erosion and Sedimentation Control Sub Plan to:

- a. undertake inspections of temporary and permanent erosion and sedimentation control devices;*
- a. ensure that the most appropriate controls are being implemented;*
- b. check that controls are being maintained in an efficient condition; and*
- c. check that controls meet the requirements of any relevant approval and/or licence condition.*

The results of these inspections and any follow-up actions will be reported in the Construction Compliance Reports.

The specific performance criteria of the ESCSP are outlined below:

- No release of sediment-laden water to occur from the construction site.
- Ensure erosion and sediment controls are sized to sufficiently protect against uncontrolled release of sediment-laden water to waterways.
- Minimise the risk of detrimental effects to ground water quality beneath the proposed development area.
- Ensure all necessary erosion controls are implemented prior to soil disturbances due to construction or vegetation clearing activities and appropriately maintained for the duration of construction.
- Ensure that erosion controls are maintained until areas of soil disturbance have been stabilised.
- Limit disturbance to areas within the construction site boundary.

1.2 Relationship with other plans

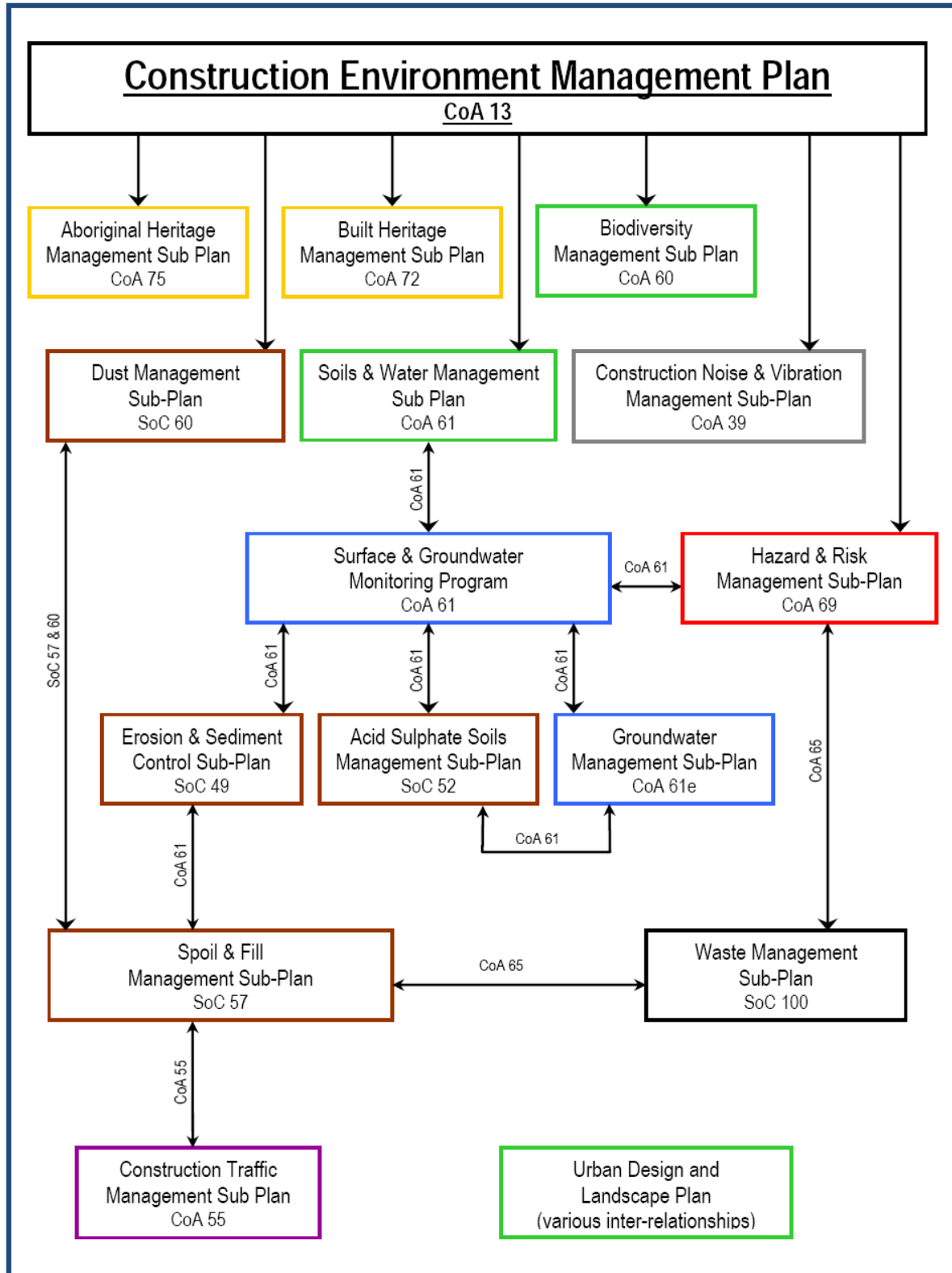
This Erosion and Sediment Control Sub-Plan (ESCSP) forms part of the Master CEMP for the SSFL Project. The ESCSP must be read in conjunction with the Spoil and Fill Management Sub Plan; all mitigation measures contained within this document should be implemented in areas nominated for spoil and fill storage areas.

Related sub-Plans that should be read in conjunction with this plan include:

- 1) Soil and Water Management Sub-Plan
- 2) Erosion and Sediment Control Sub-plan
- 3) Spoil and Fill Management Sub-Plan
- 4) Construction Traffic Management Sub-Plan
- 5) Waste Management Sub-Plan
- 6) Construction Noise and Vibration Management Sub-Plan

The relationship between the Master CEMP sub-plans is shown on Figure 1-1.

Figure 1-1: Construction Environmental Management Plan Structure



1.3 Work description

Details of construction activities and work packages for the SSFL project are included in the Master CEMP.

1.4 Existing environment and site specific issues

This section describes the surrounding area, land uses, areas of importance ie parks, reserves, and local waterways, soil types, typical characteristics and erodibility potential for the areas as described in Attachment 1.

1.5 Erosion and sedimentation risk areas

There are two sections of the SSFL construction area that have been identified as particular risk areas for erosion and sediment control. The risk areas that have been identified are outlined further below:

- The SSFL crossing of Prospect Creek; and
- The SSFL in close proximity to the Georges River

Both of these locations present particular risks due to the proximity of construction activities to the relevant water bodies and further information is provided below.

Attachment 1 provides detail on soil landscape units (SLU) and erodibility potential at specific sites along the length of the project. The sites described in Attachment 1 are as below:

Chainage (km)	Description
21.000 – 25.700	Lewis Street, Regents Park to Ronald Street, Carramar
25.700 - 30.400	Ronald Street, Carramar to Longfield Street, Cabramatta
30.400 - 35.100	Longfield Street, Cabramatta to Elizabeth Street, Liverpool
35.100 - 40.700	Elizabeth Street, Liverpool to Glenfield Substation, Glenfield
40.700 - 45.400	Glenfield Substation, Glenfield to Louise Ave, Ingleburn
45.400 - 50.000	Louise Ave, Ingleburn to Ben Lomond Road, Minto
50.000 - 54.700	Ben Lomond Road, Minto to Farrow Road, Campbelltown Station, Campbelltown
54.700 - 58.685	Farrow Road, Campbelltown Station, Campbelltown to Substation on Menangle Road, Glen Alpine

Prospect Creek

The construction of the bridge across Prospect Creek is not expected to require the placement of piles within the creek bed. There will be construction activities, such as piling and earthworks, occurring in close proximity to the creek. Accordingly appropriate erosion and sediment controls should be implemented as outlined in the guidance document “the Blue Book”, with regular inspections carried out to ensure that the designated devices are being maintained and operating effectively.

Georges River

There will be some major works which will occur on a relatively steep embankment within close proximity to the Georges River. The works, which are likely to be carried out in these locations, include some piling and general earthworks. To ensure that the earthworks and piling does not impact too significantly on erosion and sedimentation of the Georges River, it is suggested that particular attention is during the detailed design of the erosion and sediment control devices (in accordance with the requirements of “the Blue Book”) in this area. Likewise, attention must be given to this site during the construction of the erosion and sediment control devices.

2. Legislative requirements and guidelines

The key legislative instruments and guidance documents which are applicable to the project and specifically the Erosion and Sediment Control Sub Plan are outlined below:

- Key Legislation:
 - Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)
 - Environmental Planning and Assessment Act 1979 (EP&A Act) (NSW)
 - Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)
- Guidance Documents:
 - Managing Urban Stormwater – Soils and Construction Volume 1 4th Edition

Table 2-1: Legislative requirements

Relevant legislation (administering authority)	Summary of legislation requirements	Approvals/Permits or licences required
<i>Environmental Planning and Assessment Act, 1979</i> (Department of Planning, Campbelltown, Fairfield and Liverpool City Councils)	Major project approval required for any project modification.	All works must be undertaken in accordance with the conditions of consent and Statement of Conditions.
<i>Protection of the Environment Operations Act 1997 (POEO Act);</i> (DECC)	Under the Protection of the Environment Operations Act (POEO Act) certain types of waste are subject to special monitoring and reporting requirements by DECC. Tracking can be required for the consignment, transportation and acceptance for storage, treatment or disposal of certain types of waste.	The Environment Protection Licence for this Project will include requirements for waste disposal and the use of spoil and fill.

Relevant legislation (administering authority)	Summary of legislation requirements	Approvals/Permits or licences required
<p><i>National Parks and Wildlife Act, 1974</i> (Department of Environment and Climate Change)</p>	<p>The Act aims to prevent the unnecessary or unwarranted destruction of relics, and the active protection and conservation of relics of high cultural significance. This Act covers relics of both Aboriginal and non-Aboriginal habitation in NSW.</p> <p>It is an offence: to harm any animal which is part of a threatened species, population or ecological community; to pick any plant which is part of a threatened species, population or ecological community.</p> <p>It is also an offence, if a person knows that an area of land is the habitat of a threatened species, population or ecological community, to do something or fail to do something that causes damage to that habitat.</p>	<p>Pursuant to section 75U(1) of the <i>Environmental Planning and Approvals Act 1979</i>, proposals determined under Part 3A of that Act do not require separate approvals under sections 87 or 90 of this Act.</p> <p>The <i>National Parks and Wildlife Act 1974</i> provides for land to be gazetted as part of the State's National Park Estate. Due to the need to acquire approximately 1.3 ha of land from Leacock Regional Park for the Project the acquired land would require de-gazettal.</p>
<p><i>Water Management Act 2000</i> (Department of Water and Energy)</p>	<p>Under the Act, a licence would be required if water was to be extracted from a creek/bore or if any waterways were to be realigned during construction. This Act replaces the <i>repealed Rivers and Foreshores Improvement Act 1948</i>.</p>	<p>Pursuant to Section 75U(1) of the Environmental Planning and Approvals Act 1979, proposals determined under Part 3A of that Act do not require separate approvals under sections 89, 90 or 91 of this Act.</p>
<p><i>Native Vegetation Act 2003</i></p>	<p>The Act protects state-protected land and native vegetation as identified in the Act.</p>	<p>Pursuant to section 75U(1) of the Environmental Planning and Approvals Act 1979, proposals determined under Part 3A of that Act do not require separate approvals under section 12 of this Act for clearing of native vegetation. However any such impacts will be assessed as part of the environmental assessment.</p>

Relevant legislation (administering authority)	Summary of legislation requirements	Approvals/Permits or licences required
<i>(Commonwealth)</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Department of Environment, Water, Heritage and Arts)	The Act is triggered by developments that will have a significant impact on Matters of National Environmental Significance including endangered ecological communities, threatened species and migratory species. The Act requires approvals to be sought by a commonwealth agency for any act which may have a significant impact on the environment.	ARTC is a commonwealth agency under this Act. Commonwealth approval has been obtained. DEW accredited the NSW Part3A assessment process for the SSFL. Minister's approval is required for SSFL due to presence of matters of national environmental significance, threatened biodiversity listed under the <i>EPBC Act</i> : Cumberland Plain Woodland and <i>Acacia pubescens</i> .
<i>Soil Conservation Act 1938 (New South Wales Government)</i> <i>(DNR)</i>	Provides for the protection conservation of the soil resources of the State, the mitigation of soil erosion and land degradation and the conservation of water resources	No requirement for permit, approval or licence identified for construction.
<i>Water Management Act 2000 (New South Wales Government)</i>	Promotes sustainable and integrated management of the water sources of the state for the benefit of both present and future generations. Provides for all water sources to be protected and wherever possible enhanced	No requirement for permit, approval or licence identified for construction.
<i>Managing Urban Stormwater – Soils and Construction Volume 1 4th Edition</i>	This guideline provides updated guidance regarding the design, construction and implementation of measures to improve stormwater management, primarily erosion and sediment control, during the construction-phase of urban development.	Construction works will be undertaken in accordance with these guidelines.

2.1 Conditions of Approval

The conditions relevant to the erosion and sediment control sub plan imposed on the project by the Minister for Planning are as follows

Table 2-2: Minister's Conditions of Approval and Statement of Commitments

Condition No.	Summary	Reference in this Document
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Condition No.	Summary	Reference in this Document
CoA 61	<p>Prepare a Soils and Water Management Sub Plan (SWMSP) in consultation with relevant Government Departments, Councils and CLG and in accordance with the SoC as part of the CEMP. The SWMSP must be prepared in accordance with the Blue Book and must include:</p> <p>a. an Erosion and Sediment Control Sub Plan (ESCSP) that is fully integrated with the Spoil and Fill Management Sub Plan (SFMSM)</p>	<p>See Table on Consultation process in CEMP.</p> <p>See Figure 1-1: Construction Environmental Management Plan Structure</p>
CoA 49	<p>An Erosion and Sedimentation Control Sub Plan will be prepared as part of the CEMP. The Sub Plan will be prepared in consultation with Relevant Government Departments and Relevant Councils. The Sub Plan will:</p> <p>a. where relevant, be consistent with the Landcom's (2004) guideline "Managing Urban Stormwater - Soils and Construction", the RTA's "Guidelines for the Control of Erosion and Sedimentation in Roadworks" and the Department of Natural Resource's (1998) "Constructed Wetlands Manual";</p>	<p>See Table on Consultation process in CEMP.</p> <p>See Section 5.1</p>
	<p>b. identify the Construction activities that could cause soil erosion or discharge sediment or water pollutants from the site;</p>	<p>See Section 4 and Table 4-1</p>
	<p>c. describe management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including a strategy to minimise the area of bare surfaces during Construction;</p>	<p>See Section 5 and Table 5-1</p>
	<p>d. describe the location and capacity of erosion and sediment control measures;</p>	<p>See Section 5.1 and Appendix A</p>
	<p>e. identify the timing and conditions under which Construction stage controls will be decommissioned;</p>	<p>See Section 5.2</p>
	<p>f. include contingency plans to be implemented for events such as fuel spills;</p>	<p>See Section 5 and Table 5-1</p>
	<p>g. identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated; and</p>	<p>See Section 6 and Table 6-1</p>
	<p>h. include the general erosion and sedimentation management and mitigation measures contained in Section 12.3.1 of Volume 1 of the Environmental Assessment.</p>	<p>See Section 5 and Table 5-1</p>
CoA 50	<p>An appropriately qualified soil scientist will be consulted according to a schedule identified in the Erosion and Sedimentation Control Sub Plan to:</p>	<p>See Section 6, Table 6-1 and Section 7</p>
	<p>a. undertake inspections of temporary and permanent erosion and sedimentation control devices;</p>	
	<p>b. ensure that the most appropriate controls are being implemented;</p>	
	<p>c. check that controls are being maintained in an efficient condition; and</p>	
	<p>d. check that controls meet the requirements of any relevant approval and/or licence condition.</p>	
<p>The results of these inspections and any follow-up actions will be reported in the Construction Compliance Reports required by this Statement of Commitments.</p>		

3. Performance criteria

This section of the ESCSP sets the performance criteria that are required for the erosion and sediment control procedures. These criteria are a benchmark against which the performance of the erosion and sediment control procedures can be assessed.

The criteria that have been specified for assessing the erosion and sediment control devices are derived directly from the aims and objectives and are repeated below:

- No pollution of waterways due to runoff leaving construction sites.
- Minimise the risk of ground water impacts due to siting or operation of sediment control structures.
- All necessary erosion controls must be in place prior to construction and appropriately maintained for the duration of construction.
- Erosion controls will be maintained until disturbed areas have been stabilised.
- Limit disturbance to surrounding areas outside the construction site boundary.

4. Potential impacts

This section lists and describes the environmental aspects and potential impacts associated with the construction. All construction activities where soil disturbance will occur require erosion and sediment control measures to be implemented.

Listed below are specific sites and impacts that must be managed during construction.:

- Earthworks (excavation): Bowing Creek, reduction of incline/decline along the alignment, extending maintenance access ways
- Earthworks (fill): include: levelling of specific areas along the route, reduction of incline/decline, realignment of Bow Bowing Creek, extending of maintenance access ways
- Levelling of site: risk of exposing acid-sulfate soils,, erosion due to actions of rainfall/runoff and wind.
- Soil stockpiles: risk of erosion due to actions of wind and rainfall/runoff.
- Extension of existing embankments: changes to the natural ground levels may result in alteration of natural flow path, risk of soil erosion from embankments.prior to stabilisation.
- Vegetation Clearing: Once vegetation has been removed before the commencement of earthworks the unbound topsoil has the potential to be eroded by wind and water.
- Excavation of embankments: potential exposure of acid sulfate soils
- Handling, storage and disposal of contaminated soils.

Table 4-1: Activities by area

Area (suburb)	Activity
Macarthur	Re-grading
Bow Bowing Creek Realignment, Macarthur	Vegetation clearing
Birrong, Regents Park, Villawood, Cabramatta, Warwick Farm, Casula, Glenfield, Minto, Leumeah, Campbelltown, Macarthur, Glen Alpine	Earthworks (excavation)
Sefton, Carramar, Cabramatta, Liverpool, Casula, Glenfield, Minto, Campbelltown, Macarthur	Earthworks (fill)

5. Management Measures and Mitigation Strategies

The general management and mitigation measures proposed to reduce potential erosion and sedimentation that would be utilised are outlined in Table 5-1. These measures and strategies are in keeping with the Minister's Statement of Commitments 49 and include those measures outlined in Section 12.3.1 of the EA.

Table 5-1: Management measures and mitigation strategies

Mitigation measures	Responsibility
Pre-Construction	
<ul style="list-style-type: none"> ▪ All employees will be informed during site induction of safety and environmental incident management procedures, including importance of preventing erosion and sedimentation. 	PD / EM
<ul style="list-style-type: none"> ▪ Provide training for all site workers in importance of appropriate erosion and sediment control measures during site induction. 	CW-PM
<ul style="list-style-type: none"> ▪ Fence the construction area in such a way that the marking is visible to all site personnel. Care should be taken that areas outside the fenced construction area are not disturbed in any way. 	CW-PM
<ul style="list-style-type: none"> ▪ Erosion and sediment control devices will be sized and installed in accordance with the document "Soils and Construction, Landcom, Volume 1 -4th Edition, March 2004" (The Blue Book). 	CW-PM
<ul style="list-style-type: none"> ▪ Develop site-specific erosion and sediment controls and document in Environmental Control Plans 	CW-PM
<ul style="list-style-type: none"> ▪ Erosion and sediment controls must be implemented on site prior to commencement of works. 	CW-PM
Construction	
<ul style="list-style-type: none"> ▪ Ensure diversion of off-site (clean) runoff around construction site 	CW-PM
<ul style="list-style-type: none"> ▪ Program works to minimise areas of soil disturbance and the time that soil surfaces are exposed 	CW-PM
<ul style="list-style-type: none"> ▪ Undertake progressive rehabilitation of exposed surfaces to minimise dust generation. 	CW-PM
<ul style="list-style-type: none"> ▪ Ensure environmental controls are identified and implemented at creek crossings 	CW-PM
<ul style="list-style-type: none"> ▪ Minimise vegetation clearance, particularly in areas where soils are moderately to highly erodible. 	CW-PM
<ul style="list-style-type: none"> ▪ Engage Soil Scientist for monitoring, advising corrective actions and reporting on sediment basins 	CW-PM
<ul style="list-style-type: none"> ▪ Ensure that all sediment controls are properly maintained and corrective actions implemented 	CW-PM
<ul style="list-style-type: none"> ▪ Where possible construction works will be undertaken during periods of little or no rainfall. 	CW-PM
<ul style="list-style-type: none"> ▪ Cease construction activities during flooding 	CW-PM
<ul style="list-style-type: none"> ▪ Stockpiles must be placed a minimum of 20 metres away from water bodies and drainage lines. 	CW-PM

Mitigation measures	Responsibility
<ul style="list-style-type: none"> ▪ All soil or stockpiles exposed during construction works, will be stabilised as soon as possible by: <ul style="list-style-type: none"> ▶ Covering the exposed soil/stockpile with a surface cover such as HydroMulch. ▶ Spraying a binder material on the exposed surface (Contractor required to determine any approvals that may be required to spray chemical binders). ▶ Reducing the exposure time of the soil/stockpile. ▶ Implementing rehabilitation of soil/stockpile as rapidly as possible. 	CW-PM
<ul style="list-style-type: none"> ▪ Stockpiles will be managed in accordance with the Spoil & Fill Management Sub Plan 	CW-PM
<ul style="list-style-type: none"> ▪ Where activities will occur within 20m of a waterway the Environmental Control Plans will include work method statements that demonstrate protection of waterways. 	CW-PM
<ul style="list-style-type: none"> ▪ Locations for storage of materials and stockpiling will be assessed against the criteria set out in SoC 104. (CEMP Appendix D) 	CW-PM
<ul style="list-style-type: none"> ▪ Construction vehicles will be cleaned in a washdown bay only to prevent production and discharge of sediment-laden water. 	CW-PM
<ul style="list-style-type: none"> ▪ Erosion and sediment control measures will be made visible by locating a marker flag on an elevated pole. 	CW-PM
<ul style="list-style-type: none"> ▪ Daily weather reports should be used as a tool to ensure appropriate erosion and sediment management measures are in place 	CW-PM
<ul style="list-style-type: none"> ▪ Construction activities will cease during wet weather, and following wet weather if construction areas are muddy / water-logged. 	CW-PM
<ul style="list-style-type: none"> ▪ Construction activities will cease during floods 	CW-PM
<ul style="list-style-type: none"> ▪ Direct Contractors to rectify poorly performing, inadequate, or damaged erosion and sediment controls. 	CM
<ul style="list-style-type: none"> ▪ Emergency spill kit to be held on board all large vehicles and drivers trained in the deployment of spill kits. 	CW-PM
<ul style="list-style-type: none"> ▪ Storage of chemicals on site must comply with the requirements of EPA Guidelines "Bunding and Spill Management" and the relevant sections of: <ul style="list-style-type: none"> ▶ Australian Standard AS 1940B1993: The Storage and Handling of Flammable and Combustible Liquids ▶ Australian Standard AS 4452B1997: The Storage and Handling of Toxic Substances ▶ the Dangerous Goods Act 1975. 	CW-PM
<ul style="list-style-type: none"> ▪ No hazardous liquid materials are to be present on site. 	CW-PM
<ul style="list-style-type: none"> ▪ Refuelling of vehicles to be conducted in an appropriately bunded area, or entirely offsite. 	CW-PM
<ul style="list-style-type: none"> ▪ No fuel to be held in bulk containers on site, only small volumes to be stored for refuelling handheld equipment. 	CW-PM
<ul style="list-style-type: none"> ▪ Minimise traffic in construction zones and provide dedicated parking areas. 	CW-PM

Mitigation measures	Responsibility
<ul style="list-style-type: none"> ▪ Protocols for managing spills including responsibility and notification to the EMR must be included in Work Specific Environmental Control Plans. Procedures should include but not be limited to the following: ▪ Should any spillages or releases of oil occur during construction activities, clean up and remediation of the incident should be undertaken. <ul style="list-style-type: none"> ▶ Key personnel will be trained in oil spill/chemical response. ▶ Spillage of all chemicals, fuels and materials must be contained within an onsite containment system, controlled and cleaned up in a manner that prevents environmental harm and mitigates the risk of polluting surface and subsequently groundwater. ▶ Ensure all used absorbent material is placed in drums or skips for removal from site by a licensed contractor. Contaminated soil is to be stockpiled on plastic sheeting in a bunded area in order to mitigate the risk of leaching contaminants to groundwater or contaminated run off impacting on surface waters. Emergency clean up kits for oil and chemical spills will be available onsite and in all large vehicles. ▶ Any chemical spill/oil spill shall be remediated as soon as possible after the spill to prevent the risk of water contamination. ▶ Should a leak/spill occur, undertake all efforts to prevent further flow. ▶ Stop all human and vehicular traffic through spill area. ▶ All spills/leaks that occur outside containment areas to be reported as an incident. ▶ All spills must be dealt with in accordance with the Environmental Protection License. ▶ Fuels, oils and chemicals stored onsite shall be kept in a bunded area. ▶ Spillage control bunds shall be large enough to contain any spill that may occur. Bunds sized in accordance with AS1940. ▶ All hazardous materials to be approved for use on site by the Site Construction Manager. ▶ All spills and leaks are to be reported to Site Environmental Manager. 	CW-PM
Post-Construction	
<ul style="list-style-type: none"> ▪ Erosion and temporary sediment control devices must not be removed until disturbed surfaces are stabilised. 	CW-PM
<ul style="list-style-type: none"> ▪ Assessment of erosion risk must be undertaken prior to decommissioning erosion and sediment controls from specific sites 	EM
<ul style="list-style-type: none"> ▪ Site rehabilitation must be carried out progressively and immediately after completion of site works 	CW-PM
<ul style="list-style-type: none"> ▪ The Work Package Specific Environmental Management Plan must include rehabilitation activities. Site specific environmental control plans must identify rehabilitation activities including: <ul style="list-style-type: none"> ▶ Removal of excess spoil and construction waste to an appropriate waste facility ▶ Ensure that drainage lines are cleared of any excess construction waste 	CW-PM

Mitigation measures	Responsibility
<ul style="list-style-type: none"> ▶ Rehabilitation of disturbed surfaces through provision of appropriate ground cover, including endemic vegetation such as grasses, small shrubs and mulches to reduce overland flow 	

- End of Table -

Note: *EMR: Environmental Management Representative*
PD: ARTC Project Director
CM: Construction Manager
DM: Design Manager
EM: Environment Manager
CW-PM: Contractors – Contract Works package Manager
CLM: Community Liaison Manager

5.1 Erosion and Sediment Controls

Plans have been prepared that outline the controls that will be utilised to manage erosion due to construction of the SSFL. The erosion and sediment control measures have been prepared in accordance with the requirements of “*Soils and Construction – Volume 1 – 4th Edition, March 2004*” (“the Blue Book”) and are detailed on the plans attached in **Appendix A**.

The Blue Book should be consulted in conjunction with this ESCSP, particularly with regard to details such as placement and construction of erosion and sediment control devices. The former Department of Natural Resources (DNR) document “Constructed Wetlands Manual” was considered in the production of the erosion and sediment control measures. The Roads and Traffic Authority (RTA) document “Guidelines for the Control of Erosion and Sedimentation in Roadworks” is not currently utilised by the RTA. The RTA specification “RTA QA Specification G39 ‘Soil and Water Management (Erosion and Sediment Control Plan)’” was considered in the preparation of this document. RTA specification G39 generally references the industry standard document “the Blue Book”.

The erosion and sediment control measures are shown on the plans indicatively, taking into account the topography, rail alignment works, existing drainage and water courses. Once construction access is gained at the project site, the type and location of the erosion and sediment control measures required should be confirmed by the CW-PM as being appropriate prior to construction commencing. Once the position of each sediment control device has been confirmed, the location and capacity of the device must be included in the site-specific Environmental Control Plans (ECP). To ensure compliance with the Statement of Commitments, the ECP must be submitted to the Environmental Manager who will coordinate submissions to the Environmental Management Representative (EMR) and to the Department of Planning, and DECC.

5.2 Decommissioning of erosion and sediment control measures

Erosion and sediment control measures must not be decommissioned until the surrounding areas where works have been carried out have been stabilised. Typically stabilisation works will include:

- Hydro Mulch type binder for erosion control
- Use of biodegradable blankets for immediate ground cover
- Straw mulching
- Primary vegetation of site to assist in short term stabilisation and erosion and sedimentation reduction
- Secondary vegetation of site to assist in long term stabilisation and erosion and sedimentation reduction, usually consisting of vegetation native to the local area.

Progressive rehabilitation of exposed surfaces will be undertaken to control dust generation. This will include the measures outlines above. The revegetation of the exposed sites will occur in accordance with the Biodiversity Management sub-plan where that is not inconsistent with RailCorp's Planting schedule for Rail Corridor vegetation

Erosion and sediment controls may be maintained onsite for up to two (2) years after completion of construction. However, due to the variability of the factors involved, erosion and sediment control measures should be maintained onsite until secondary vegetation is fully established. The erosion and sediment control devices will only be decommissioned once the Environmental Manager agrees that stabilisation of the area is complete and the risk of erosion is low.

6. Monitoring and reporting

Throughout the pre-construction, construction and post construction phases there should be continuous monitoring and reporting of the effectiveness of the erosion and sediment control devices. Table 6-1 outlines the monitoring and reporting strategies, which are in keeping with the Statements of Commitment 49, 50 and 61.

Table 6-1: Monitoring and reporting requirements

Monitoring and reporting requirements	Responsibility
Pre-construction	
<ul style="list-style-type: none"> ▪ Ensure that Erosion and Sediment Control Plan is fully integrated with the Spoil and Fill Management Sub Plan at each location 	PD
<ul style="list-style-type: none"> ▪ Check soil sedimentation and fill storage structures are in place before construction activities commence. 	EM / CW-PM
Construction	
<ul style="list-style-type: none"> ▪ Temperature, humidity and wind monitoring. Daily data will be provided to DECC with the monthly Construction Report 	EM
<ul style="list-style-type: none"> ▪ Weekly inspection of erosion and sediment controls will be undertaken by the CW-PM and a copy of the inspection checklist provided to the EM. 	CW-PM
<ul style="list-style-type: none"> ▪ The Weekly Monitoring and Inspection Results Form (Appendix C) will be used to record results of the inspections. 	
<ul style="list-style-type: none"> ▪ The following inspections and checks will be undertaken monthly by a soil scientist: <ul style="list-style-type: none"> ▶ Undertake inspections of temporary and permanent erosion and sedimentation control devices ▶ Ensure that the most appropriate controls are being implemented ▶ Check that controls are being maintained in an efficient condition ▶ Check that the controls meet the requirements of any relevant approval and/or licence condition ▪ An inspection report will be provided to the EM for inclusion with the monthly construction report (required under EPL 12971) and Construction Compliance Report (6 monthly). 	CW-PM
<ul style="list-style-type: none"> ▪ Undertake inspections of sediment controls following heavy rainfall (ie 20 mm in 24 hrs). Report on inspection using Monitoring and Inspection Results Form (Appendix C) 	CW-PM
<ul style="list-style-type: none"> ▪ Should an erosion and sediment control device fail and discharge of sediment-laden water occurs, the following information will be recorded (as per EPL 12971): <ul style="list-style-type: none"> ▶ cause, time and duration of event; ▶ estimated volume released ▶ actions taken to control and remediate the uncontrolled discharge 	CW-PM

Monitoring and reporting requirements	Responsibility
<ul style="list-style-type: none"> ▶ details of measures implemented to prevent recurrence ▶ any other relevant items. <p>A report will be provided to the EM for submission to EPA within 7 days of the incident.</p>	
Post-construction	
<ul style="list-style-type: none"> ▪ Check that site rehabilitation activities are undertaken promptly after site works are completed. 	EM
<ul style="list-style-type: none"> ▪ Demonstrate that rehabilitation measures are complete prior to decommissioning of sediment and erosion controls. 	CW-PM
- End of Table -	

Note: *EMR: Environmental Management Representative*
 PD: ARTC Project Director
 CM: Construction Manager
 DM: Design Manager
 EM: Environment Manager
 CW-PM: Contractors – Contract Works package Manager
 CLM: Community Liaison Manager

7. Corrective action

Possible non-conformances with this Sub-Plan will include non-compliance with the management measures and mitigation strategies outlined above.

All incidents and non-conformances are to be reported using the Non-Conformance Report Form (appended to the CEMP) and investigated and corrected to ensure effective environmental management practices at all times.

The Weekly Monitoring and Inspection Results Form (**Appendix C**) will provide assistance in identifying issues requiring corrective action.

8. Document control

The Erosion and Sediment Control Sub-Plan will be reviewed and amended, if required or if the activities change, and reissued as soon as possible.

Initially the document should be reviewed as soon as the Method of Work Plans for each Section have been prepared. Any changes in the proposed construction methodology and subsequent impacts and mitigation measures required need to be updated in this Sub Plan.

The Erosion and Sediment Control Sub-Plan will be issued to all Contract Work Package Managers by the Construction Manager.

ATTACHMENT 1:

Potential Impacts of works and Soil Landscape Units

Lewis Street, Regents Park (21.000) to Ronald Street, Carramar (25.700):

- Industrial park located to the east of the tracks from Lewis Street, Regents Park to Cooper Road, Birrong and from Miller Road, Villawood to Woodville Road, Villawood
- Residential uses on the western side of tracks from Lewis Street, Regents Park to Ronald Street, Carramar
- Residential uses on eastern side of tracks from Cooper Road, Birrong to Miller Road, Villawood, Woodville Road, Woodville to Carramar Railway Station, Carramar
- Rail underpass under Woodville Road, Villawood
- Tracks cross Byrnes Creek at Christina Road, Villawood and Llewellyn Ave, Villawood
- Recreational facilities located at Chester Hill Road, Chester Hill (playground), Waldron Road, Chester Hill (Scout Hall) and Kamira Avenue, Villawood (playground)

Table 8-1: SLU and erodability (Lewis St Regents Park – Ronald St, Carramar)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Lewis Street Regents Park to auburn Road, Birrong	Disturbed Terrain (xx)	Local Relief: less than 10m Slopes: less than 30%	- Low to high for non-concentrated flows - Low to extreme for concentrated flows
Auburn Road, Birrong to Woods Road, Sefton	Birrong (bg)- Fluvial	Local Relief: 5m Slopes: less than 3%	- Low to moderate for non-concentrated flows
Woods Road, Sefton to Woodville Road, Villawood	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less then 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
Woodville Road, Villawood to Ronald Street, Carramar	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less then 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Ronald Street, Carramar (25.700) to Longfield Street, Cabramatta (30.400) (28.200-31.776):

- Tracks cross Prospect Creek between Sandal Crescent, Carramar and Prospect Road/ Moore Street, Canley Vale
- Recreational facilities located at Fraser Road, Canley Vale (sport oval), Bartley Street, Cabramatta (playground), Togil Street, Canley Vale (public reserve)
- Cabra-Vale Leisure Centre (currently under construction?)
- Residential uses on both sides of tracks from Ronald Street, Carramar to Longfield Street, Cabramatta

Table 8-2: SLU and erodability (Ronals St Carramar – Longfield St Cabramatta)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Ronald Street, Carramar to Senior St, Canley Vale	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Senior Street, Canley Vale to Longfield Street, Cabramatta	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Longfield Street, Cabramatta (30.400) (28.200-31.776) to Elizabeth Street, Liverpool (35.100):

- Residential use areas from Longfield Street, Cabramatta to Railway Street/Broomfield Street, Cabramatta and Lawrence Hargrave Road, Warwick Farm to Lachlan Street, Liverpool
- Tracks cross Cabramatta Creek between Railway Street/Broomfield Street, Cabramatta and Station Street, Warwick Farm in the grounds of Cabramatta Sportsground, Jacqui Osmond Reserve, Cabramatta Rugby League Club, Stroud Park, and Irelands Bridge Reserve.
- Recreation facilities located from Cabramatta Creek to Lawrence Hargrave Road, Warwick Farm (rugby league club), Cabramatta Creek to Sappho Road, Warwick Farm (public reserve), and Hart Street, Warwick Farm (public park), Remembrance Avenue, Warwick Farm (public reserve).
- Liverpool Hospital on western side of tracks from Campbell Street to Moore Street, Liverpool on western side of tracks and to Elizabeth Street on eastern side of tracks
- Educational facilities located at Lachlan Street, Liverpool to Campbell Street, Liverpool (Liverpool Boys and Girls High Schools), and Lawrence Hargrave School on Station Street, Warwick Farm.

Table 8-3: SLU and erodability (Longfield St Cabramatta – Elizabeth St, Liverpool)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Longfield Street, Cabramatta to Railway Street/Broomfield Street, Cabramatta	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
Railway Street/Broomfield Street, Cabramatta to Lawrence Hargrave Road, Warwick Farm	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Lawrence Hargrave Road, Warwick Farm to Elizabeth Street, Liverpool	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Elizabeth Street, Liverpool (35.100) to Glenfield Substation, Glenfield (40.700):

- Liverpool Hospital on eastern side of tracks from Campbell Street, Liverpool to Elizabeth Street, Liverpool. (Area to the eastern side of tracks is Warwick Farm).
- Educational facilities located at Elizabeth Street, Liverpool (South Western Institute of TAFE)
- Recreational facilities located on Newbridge Road, Liverpool (barbecue and picnic areas), Shepherd Street, Liverpool to Rushton Place, Casula (public park), Rushton Place, Casula (public park), end of Canberra Ave, Casula to Glenfield Road, Casula (regional park)
- Georges River in close proximity to tracks on the eastern side of tracks from Elizabeth Street, Liverpool to end of Leacocks Regional Park, Casula
- Tracks cross Glenfield Creek in Leacocks Regional Park, Casula Road, Casula
- Residential uses between Light Horse Park and Mill Park on eastern side of tracks
- Residential uses from Elizabeth Street, Liverpool to Casula Road, Casula on western side of tracks
- Residential uses from Riverpark Drive, Liverpool to Shepherd Street, Liverpool on the eastern side of the tracks
- Unused floodplain between Casula Road, Casula and Glenfield Waste Disposals on eastern side of tracks
- Glenfield Creek in close proximity to tracks between Glenfield Road, Glenfield through Leacock Regional Park to where the tracks cross Glenfield Creek at Casula Road, Casula

Table 8-4: SLU and erodability (Elizabeth St Liverpool – Glenfield Substation)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Elizabeth Street, Liverpool to Liverpool Railway Station, Liverpool	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
Liverpool Railway Station, Liverpool to South Western Motorway, Liverpool	Luddenham (lu)- Erosional	Local Relief: 50-80m Slopes: less than 10m	- Moderate to very high for non-concentrated flows - High to very high for concentrated flows
South Western Motorway, Liverpool to Casula Railway Station, Casula	East of tracks: Luddenham (lu)- Erosional West of tracks: South Creek (sc)- Fluvial	Local Relief: 50-80m Slopes: less than 10m Local Relief: less than 10m Slopes: less than 5%	- Moderate to very high for non-concentrated flows - High to very high for concentrated flows - Potentially very high to extreme
Casula Railway Station, Casula to Glenfield Farm, Casula	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Glenfield Farm, Casula to start of Glenfield Creek, Casula	Luddenham (lu)- Erosional	Local Relief: 50-80m Slopes: less than 10m	- Moderate to very high for non-concentrated flows - High to very high for concentrated flows
Start of Glenfield Creek, Casula to Glenfield Substation, Glenfield	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Glenfield Substation, Glenfield (40.700) to Louise Ave, Ingleburn (45.400):

- Glenfield Waste Disposals on eastern side of tracks, off Cambridge Ave, Glenfield
- Educational facilities located on Glenfield Road, Glenfield (Department of Education Regional Centre), Roy Watts Road, Glenfield (Hurlstone Agricultural High School and Glenfield Park School), Railway Parade, Glenfield (Glenfield Primary School)
- Crosses Bunbury Curran Creek adjacent to Railway Parade (Glenfield)

- Crosses Redfern Creek between two portions of Railway Parade (Macquarie Fields)
- Recreational facilities located on Railway Parade, Glenfield (playground, tennis, baseball, skate park), Railway Parade, Macquarie Fields (golf club)
- Residential uses from Glenfield Road, Glenfield to Salisbury Avenue, Glenfield, Fraser Street, Macquarie Fields to end of Railway Parade, Macquarie Fields, Henderson Road, Ingleburn to Louise Avenue, Ingleburn on the south-eastern side of tracks
- Residential uses from Henderson Road, Ingleburn to Louise Avenue, Ingleburn on the north-western side of tracks
- Unused land between Hurlstone High School, Glenfield to Macquarie Links International Golf Club, Henderson Road, Macquarie Fields
- Bunbury Curran Creek in close proximity to tracks between Railway Parade, Macquarie Fields, and Waratah Crescent, Macquarie Fields, on western side of tracks
- Tracks cross Redfern Creek at the end of Railway Parade, Macquarie Fields, at the edge of Milton Park
- Redfern Creek in close proximity to tracks on the eastern side from Henderson Road, Ingleburn to Aero Road, Ingleburn
- Tracks cross Bunbury Curran Creek Canal on Railway Parade, Glenfield in the area of Kennett Park, Railway Parade, Glenfield

Table 8-5: SLU and erodability (Glenfield Substation – Louise Ave, Ingleburn)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Glenfield Substation, Glenfield to Glenfield Road, Casula	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
Glenfield Road, Casula to Glenfield Railway Station, Glenfield	Luddenham (lu)- Erosional	Local Relief: 50-80m Slopes: less than 10m	- Moderate to very high for non-concentrated flows - High to very high for concentrated flows
Glenfield Railway Station, Glenfield to Crossing of Bunbury Curran Creek, Glenfield	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Crossing of Bunbury Curran Creek, Glenfield to Crossing of Redfern Creek Macquarie Fields	Luddenham (lu)- Erosional	Local Relief: 50-80m Slopes: less than 10m	- Moderate to very high for non-concentrated flows - High to very high for concentrated flows

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Crossing of Redfern Creek, Macquarie Fields to Aero Road, Ingleburn	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Aero Road, Ingleburn to Louise Avenue, Ingleburn	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Louise Ave, Ingleburn (45.400) to Ben Lomond Road, Minto (50.000):

- Recreational facilities located at Freeman Cct, Ingleburn (public reserve), Victoria Road, Minto (hockey and showground), Memphis Street, Minto (touch football), Redfern Road, Minto (netball, stadium, scout and guide halls)
- Residential uses on both sides of tracks from Louise Avenue, Ingleburn to Wilkinson Crescent Ingleburn, Essex Street, Minto to Redfern Road, Minto on the eastern side of tracks
- Industrial uses from Broadhurst Street, Ingleburn to Hattah Way, Minto on the western side of the tracks
- Tracks cross Bow Bowing Creek between Ingleburn Road, Ingleburn and Freeman Cct, Ingleburn and at end of Victoria Road, Minto (Kayess Park/Victoria Park)

Table 8-6: SLU and erodability (Louise Ave Ingleburn – Lomond Rd Minto)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Louise Avenue, Ingleburn to first crossing of Bow Bowing Creek, Ingleburn	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
First crossing of Bow Bowing Creek, Ingleburn to Second crossing of Bow Bowing Creek, Minto	South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme
Second crossing of Bow Bowing Creek, Minto Ben Lomond Road, Minto	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

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Ben Lomond Road, Minto (50.000) to Farrow Road, Campbelltown Station, Campbelltown (54.700):

- Industrial uses between Ben Lomond Road, Minto and Reaghs Farm Road and Magnum Place, Minto and Rose Payten Drive, Minto on eastern side of tracks
- Recreational facilities located on Pembroke Drive, Minto (playground and barbecue area), O'Sullivan Road, Minto (athletics, football, sports stadium)
- Educational facilities on Moore Street, Campbelltown (Campbelltown Performing Arts High School)
- Residential uses from Ben Lomond Road, Minto to Rose Payton Drive, Minto, Moore Street, Campbelltown to Farrow Road, Campbelltown on the western side of tracks, O'Sullivan Road, Leumeah to Farrow Road, Campbelltown on the eastern side of tracks
- Tracks cross Leumeah Creek near Hollyea Road, Leumeah, McBarron Creek at Pembroke Park, Pembroke Drive, Minto, Smiths Creek, Old Leumeah Road, Leumeah
- Bow Bowling Creek in close proximity to tracks on the western side between Rose Payten Drive, Leumeah and Farrow Road, Campbelltown

Table 8-7: SLU and erodability (Ben Lomond Rd Minto – Campbelltown Station)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Ben Lomond Road, Minto to Farrow Road, Campbelltown Railway Station, Campbelltown	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less than 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows
Leumeah Railway Station, Leumeah	East of tracks: South Creek (sc)- Fluvial	Local Relief: less than 10m Slopes: less than 5%	- Potentially very high to extreme

Farrow Road, Campbelltown Station, Campbelltown (54.700) to Substation on Menangle Road, Glen Alpine (58.685):

- Residential uses from Farrow Road, Campbelltown to Narellan Road, Campbelltown on the eastern side of tracks
- Industrial uses from Narellan Road, Campbelltown to Geary Street, Campbelltown
- Recreational facilities located at Camden Road, Campbelltown (playground, picnic and barbecue areas), Gilchrist Drive, Campbelltown (scout hall), Menangle Road, Glen Alpine (golf club)

- Educational facilities located from Gilchrist Drive to Substation on Menangle Road, Glen Alpine on the western side of tracks
- Tracks cross Fishers Ghost Creek along the edge of Koshigaya Park, Campbelltown
- Tracks cross Bow Bowing Creek just before the round-about on cnr of Menangle Road and Glen Alpine Drive, Glen Alpine
- Tracks cross small creek (tributary of Bow Bowing Creek) which runs between Tailby Street, Campbelltown and Hidcote Road, Campbelltown and at Menangle Road, Glen Alpine (near intersection with Glen Alpine Road, Glen Alpine)
- Tracks in close proximity to Bow Bowing Creek from Farrow Road, Campbelltown to Hidcote Road Campbelltown on the north-western side of the tracks
- Dams located both sides of tracks in the area of the roundabout on cnr of Menangle Road and Glen Alpine Drive, Glen Alpine. Bow Bowing Creek flows through both dams

Table 8-8: SLU and erodability (Campbelltown Station – Menangle Rd Glenalpine)

Area	Soil Landscape Units (SLU)	Characteristics of SLU	Erodibility of SLU
Farrow Road, Campbelltown Railway Station, Campbelltown	Blacktown (bt)- Residual	Local Relief: 30m Slopes: less then 5%	- Low to very high for non-concentrated flows - Moderate to high for concentrated flows

Appendix A

Erosion and Sediment
Control Measure Locations

(Provided separately on disk)

Please see enclosed CD for Erosion and Sediment Control Measure location drawings.

Appendix B

Change Register

Appendix C

Weekly Monitoring and
Inspection Results

Weekly Monitoring and Inspection Results

Location / Work Package

Date of inspection:

Inspected by:

ITEM	YES	NO	N/A
Copy of CEMP is readily accessible			
Check training, complaints registers for new entries			
Incident Response Plan displayed in a prominent position			
Soil and water management measures are in place			
Soil and water management measures are well maintained			
There is minimal dirt being tracked onto public roads			
Water quality in downslope areas appears to be unaffected by the works			
No obvious impact outside the defined construction area (eg, vehicles parked, vegetation removed or affected, temporary storage)			
Stockpiles appear adequately maintained and managed			
Vegetation protection measures in place and effective			
Sites where construction has ceased are being rehabilitated			
No illegal discharges to stormwater or waterways			
No illegal discharges to sewer			
Waste receptacles are in place and adequately maintained			
Hazardous materials are being stored in designated area(s)/container(s)			
Spill control measures in place and easily accessible – including spill kits/absorbents/sand			
Bunds of adequate size and sound construction			

Insert additional items as/if required.

Provide explanation below for items marked 'No'

Comments:

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