

Southern Sydney Freight Line Spoil and Fill Sub-Plan ARTC

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**PLANNING
URBAN FUTURES**

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Contents

	Page Number
1. Introduction	4
1.1 Purpose and Objectives	4
1.2 Integration with other Sub-Plans in the CEMP	5
1.3 Work description	7
1.4 Existing environment and site specific issues	7
1.4.1 Spoil	7
1.4.2 Topsoil	7
1.4.3 Fill.....	8
1.4.4 Select Material	8
1.4.5 Virgin Excavated Natural Material.....	8
1.4.6 Contaminated Land	8
1.4.7 Movement and Transportation of Fill & Spoil Material	9
1.4.8 Phase 1 Contamination Assessment	11
2. Legislative requirements and guidelines	13
3. Performance criteria.....	16
4. Potential impacts.....	17
5. Mitigation measures.....	18
5.1 Management measures and mitigation strategies	22
5.1.1 Separately stockpile different materials.....	22
5.1.2 Storage of Fill.....	22
5.1.3 Re-use of Unsuitable Spoil	23
5.1.4 Management of Stockpiles	23
5.1.5 Storage of Topsoil	24
5.1.6 Hauled Fill.....	25
5.1.7 Independent Verification.....	25
6. Monitoring and reporting	29
7. Corrective action	32
8. Document control.....	33
Annexure A: Spoil and Fill Checklist	34



List of Tables

Table 1-1: Fill Requirements for the Project..... 9

Table 1-2: Fill volumes for transportation 10

Table 2-1: Legislative requirements..... 13

Table 4-1: Potential environmental impacts 17

Table 5-1: Mitigation measures 18

Table 5-2: Environmental Controls and Procedures for Spoil and Fill Management..... 26

Table 6-1: Monitoring and reporting requirements..... 30

1. Introduction

This Plan documents the management of spoil and fill during the construction of the SSFL Project. The plan has been prepared in accordance with the requirements of the Minister for Planning's Conditions of Approval (CoA) 55, 59, 61 and 65. The plan also reflects the requirements of Statement of Commitments (SoC) 57 and 58.

The construction of the Project involves substantial excavation and earthworks to achieve the final design and will require movement of large quantities of cut material to other locations along the length of the new railway alignment. Overall, the earthworks will not be balanced; it is estimated that the project will generate approximately 299,000 m³ of fill that is to be reused within the railway corridor on the project, together with importation of up to 214,000 m³ of select material, dependant on the quality of earthworks material found on the project.

The management of imported fill and the movement of cut material along the construction corridor will be undertaken so as to minimise potential environmental and social impacts. This will be achieved through staging of the works wherever possible until access between cut and fill locations can be achieved through the project.

1.1 Purpose and Objectives

The purpose of this Management Plan is to:

- Identify the environmental management issues associated with the sourcing, handling, transportation, stockpiling, disposal and reuse of spoil and fill material.
- Document and describe the systems and procedures developed to mitigate environmental impacts.
- Ensure site personnel are aware of ARTC's environmental obligations and work procedures.

The objectives of the Management Plan are to:

- Establish procedures and criteria for spoil/fill material handling, transportation and movement, stockpiling, reuse and disposal.
- Protect the environment by preventing or minimising adverse impacts in relation to local amenity, traffic requirements, and safe and tidy fill handling techniques.
- Ensure that appropriate environmental systems and controls are implemented during material management activities.
- Achieve sustainable use of resources by maximising the reuse of earthen materials generated on-site.



1.2 Integration with other Sub-Plans in the CEMP

This Spoil and Fill Management Sub-Plan (S&FMSP) must be read in conjunction with the other related sub-plans that form part of the CEMP. Related sub-Plans that must be read in conjunction with this Spoil and Fill Management Sub-Pan include:

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

All of these Sub-Plans, making up part of the CEMP, are interrelated in accordance with the following Sub-Plan Structure Diagram (following page):



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

The existing environment and site specific issues are presented below by the environmental issue they address.

1.4.1 Spoil

For the purpose of this Management Plan, spoil is defined as earthen material that is surplus to requirements or unsuitable for reuse in fill and embankments (such as unsuitable rock and soil material) or material that is contaminated.

This plan has been prepared to facilitate the beneficial reuse of all material, ensuring that none is disposed off-site, except if unsuitable for reuse. Unsuitable (non-contaminated) spoil will be reused in the following ways:

- Widen embankments where possible
- Land contouring
- Landscaping mounds
- Landscape treatments
- Noise mounds.

The Statements of Commitments 57 and 58 both highlight the need for reuse or recycling of spoil and treated spoil. With the potential for contaminated material to be encountered in some areas of excavation there is a potential for reuse of the material within the railway corridor. The details for reuse of contaminated soils will be described in the Waste Management Sub-Plan.

1.4.2 Topsoil

Topsoil will be stripped and recovered for reuse in landscaping and revegetation. Topsoil is rich in nutrients, minerals and native flora seeds and has the structure and organic content suitable for vegetative growth. On average, the top 100mm of topsoil will be collected and stored for future use.

The reuse of raw products sourced on site such as topsoil, mulch, and spoil (albeit of a limited quantity) will provide a range of economic and environmental benefits.

In addition, it will reduce the impacts and costs associated with importing material or disposing of material off-site. In particular, the principles of Ecologically Sustainable Development are satisfied through the beneficial reuse of resources generated by the project.



1.4.3 Fill

For the purposes of this Management Plan, fill is defined as earthen material cut from one location along the corridor (for example, for a detention basin or cut excavations) and relocated elsewhere as compacted fill. Where possible, Cut and fill material will not be stockpiled, but will be removed from the site of excavation and transported directly to the construction face for immediate reuse as compacted fill.

The quantities used in this Plan in relation to excavated fill material are based on best estimates, assumptions about site conditions and experience on similar projects. Accordingly, quantities of mass haul will be refined as detailed designs are completed and construction work proceeds.

1.4.4 Select Material

For the purposes of this Management Plan, select material is defined as earthen material of comparatively higher quality, necessary for incorporation in upper earthworks layers as part of the overall formation design. Wherever possible, select material will be sourced on site, and stockpiled as necessary until incorporated in the works. However, preliminary investigations suggest that a high proportion of the select material required for the project will need to be sourced from off site. RailCorp has a large stockpile of existing select material located on Railway Land at Chullora. The material is mostly made up of spent ballast. It will be collected by Truck and transported to the work site on an as needs basis.

1.4.5 Virgin Excavated Natural Material

It is possible that at greater excavation depths, excavated bedrock may be classed as virgin excavated natural material, in which case, sampling of these materials may not be required. This material should be suitable for use as construction fill and would be utilised within the earthworks for the project. It is likely that this type of material will only be sourced from the deeper section of the Sefton Dive and usable quantities are likely to be small. A small stockpile is proposed, in the site compound near the Dive construction site, from where it will be distributed by trucks for use in embankments, west of the Dive, when required.

1.4.6 Contaminated Land

The remedial and management options adopted for management of contaminated soils would depend on such factors as the type of contamination encountered, timeframe for remedial works and budget constraints. However, typical remedial options would include:

- excavation, on-site remediation and re-use
- excavation and off-site disposal

All excavated soils to be disposed of off-site as part of the works would require classification and management in accordance with Environment Protection Authority (1999) *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*. Excavated materials would need to be suitably stockpiled and separated into material types, with



samples collected from the materials. Samples would be tested for contaminants considered likely at the site.

1.4.7 Movement and Transportation of Fill & Spoil Material

Volumes and Sources of Fill Material

Overall approximately 513,000 m³ of fill material will be required for the construction of the Project over first 21 months of the construction period. More than half of this material will be sourced from within the project. The volumes required and the sources are shown below.

Table 1–1: Fill Requirements for the Project

Section	Approx total required (m ³)	Sourced internally (m ³)	Approx Off Site fill (m ³)
Sefton Dive	8,000	1,000	7,000
E&RW1	35,000	11,000	24,000
E&RW2	81,000	39,000	42,000
E&RW3	296,000	180,000	116,000
E&RW4	93,000	68,000	25,000
Total	513,000	299,000	214,000

While it is anticipated that some select material will be obtained from the surplus cut material on the Project, up to 214,000 m³ of select material will need to be imported from external sources to fulfil the requirements of the Project.

The potential sources of this select material are:

- RailCorp ballast cleaning plant for the bulk of the select material
- Local contractors for crushed sand stone (if required)



Transportation of Fill Material

The volumes of fill material to be moved during the construction are set out in Table 1–2. Wherever possible, material is to be moved internally along the construction corridor.

Where the construction programme necessitates movement of cut material prior to access along the construction corridor becoming available, material will be hauled on public roads by road trucks, in accordance with the project Construction Traffic Management Sub-Plan.

Table 1–2: Fill volumes for transportation

Section	Approx volumes of cut and cart to other section of SFFL (spoil) (m ³)	Approx volumes of cut and cart from other section of SFFL (fill) (m ³)	Off Site Fill to be transported on public roads (m ³)
Sefton Dive	46,000	0	7,000
E&RW1	44,000	0	24,000
E&RW2	5,000	24,000	42,000
E&RW3	37,000	153,000	116,000
E&RW4	0	46,000	25,000
Total	132,000	223,000	214,000

The locations where fill will be required to be trucked in to site will include:

- Construction of the embankments either side of Woods Road and Hector Street overbridges
- The approaches to the Prospect Creek Bridge
- The approaches to the Cabramatta Creek Bridge
- The approaches to the Shepherd Street overbridge
- The embankment widening beside the former Liverpool Golf Course
- The approaches to the Glenfield Creek Bridge
- The approaches to the Glenfield SSFL Freight of Main South Railway Flyover
- The approaches to various crossings of both Banbury Curran and Bow Bowing Creeks

Haulage by road trucks will be along the Project corridor wherever possible. In instances where haulage of cut material is required by road, exit from and entry to the project will be via specific Project access points, using designated haul routes, as detailed in the Construction Traffic Management Sub-Plan. It is estimated that 90% of the cut and cart volumes (118,800 m³) and all off site fill (214,000 m³) will be hauled on public roads.



Both the Construction Traffic Management Sub-Plan and the Hazard and Risk Management Sub-Plan will be subject to RTA and Council comment prior to both approval by the Director General of the DoP and subsequent implementation.

1.4.8 Phase 1 Contamination Assessment

A Phase 1 Environmental Site Assessment was provided by consultants Parsons Brinkerhoff, (2008). The objectives of the assessment were to:

- assess likely past and present on and off site activities with the potential to cause contamination;
- assess the likelihood of contamination in the proposed alignment (if any);
- identify potential contaminants of concern;
- understand the influence of site-specific, geologic and hydrogeologic conditions on the fate and transport of any impacts found;
- identify potential risks reported impacts may pose to human health and the environment; and
- provide a basis for a more detailed investigation (if required).

Recommendations from the Phase 1 Assessment are provided below and must be considered by Contractors when carrying out excavation and earthworks activities:

- uncontrolled imported fill material.
- use of the site as a rail corridor including:
 - existing adjacent railway lines
 - disposal/deposition of ash within the rail corridor
 - historical coal storage
 - existing infrastructure
 - infrastructure maintenance
- potential existing contamination issues at sites to be acquired outside the existing rail corridor.
- a previous transformer spillage in the rail corridor near Narellan Road overpass.
- Neighbouring sites which could potentially impact on the contamination status of the proposed alignment including:
 - RailCorp depots and other depots/industrial facilities
 - electrical substations adjacent to or upgradient of the site
 - rail bridges and adjacent roadways and car parks



- service stations and car mechanics.

Due to the nature of the proposed works, it is considered that these potentially contaminating activities do not pose a high risk, however should any signs of contamination become apparent during the works, including excavated soil which is odorous or stained or heterogeneous fill material containing anthropogenic materials, testing of the materials should be undertaken immediately.

As part of any construction work, all excavated material for off-site disposal or re-use should be appropriately sampled and classified in-situ or stockpiled and assessed against the current NSW DECC 2008 *Waste Classification Guidelines* for off-site disposal or *National Environmental Protection Measure On-site Criteria* for re-use on-site. Material that is considered virgin excavated natural material (VENM) (as defined by the NSW DECC) should be stockpiled separately for either off site disposal or re-use.



2. Legislative requirements and guidelines

This section details the legislative requirements of the work as identified in the overarching CEMP. If further detail is required, reference may also be made to relevant CoA advised by the Minister for Planning, and to items from the Statement of Conditions (SoC), advised by ARTC in the Environmental Assessment.

The key legislative instruments and guidance documents which are applicable to the project and specifically Spoil and Fill 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)*

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. Notify ARTC Project Manager if any significant changes to the project are desired. ARTC Project Manager to identify any further environmental assessment required.
<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-gazetted.</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 1999, 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
<p><i>(Commonwealth)</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Department of Environment, Water, Heritage and Arts)</p>	<p>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.</p> <p>The Act requires approvals to be sought by a commonwealth agency for any act which may have a significant impact on the environment.</p>	<p>ARTC is a commonwealth agency under this Act.</p> <p>Commonwealth approval has been obtained. DEW accredited the NSW Part3A assessment process for the SSFL.</p> <p>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>.</p>
<p><i>Soil Conservation Act 1938 (New South Wales Government) (DNR)</i></p>	<p>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</p>	<p>No requirement for permit, approval or licence identified for construction.</p>
<p><i>Water Management Act 2000 (New South Wales Government)</i></p>	<p>Promotes sustainable and integrated management of the water sources of the state for the benefit of both present and future generations.</p> <p>Provides for all water sources to be protected and wherever possible enhanced</p>	<p>No requirement for permit, approval or licence identified for construction.</p>



3. Performance criteria

This section details specific means to assess the degree to which the objectives detailed in Section 1.1 have been met. They may be used to assess the effectiveness of the management measures detailed in Section 5 and to encourage continual improvement. The performance criteria for the Spoil and Fill Management Sub-Plan are to:

- Maintain natural surface water drainage lines.
- Ensure that there is no discernable release of sediment into any waterway as a consequence of the works.
- Ensure spoil and fill excavation is in compliance with excavation plans.
- Ensure that dust generation and cross-contamination of soil types in stockpiles does not occur.
- Ensure that stockpile management, and the movement of spoil and fill, minimises impacts on the environment.



4. Potential impacts

As defined in ISO 14001, an environmental aspect is “an element of an organisation’s activities or products or services that can interact with the environment” (SAI Global, 2004). Environmental aspects within this project are specific actions or items that could cause an impact. The process of identifying impacts requires a progressive break down of each activity into its environmental aspects.

The activities associated with the generation and management of spoil and fill materials are detailed in Table 4-1:

Table 4–1: Potential environmental impacts

Environmental aspect	Environmental impact
Excavation and blasting (if required)	<ul style="list-style-type: none"> ▪ Noise ▪ Dust Generation ▪ Erosion and Sedimentation
Transportation	<ul style="list-style-type: none"> ▪ Noise ▪ Dust Generation ▪ Air Pollution ▪ Disturbance of local amenity ▪ Dispersal of Weeds
Storage	<ul style="list-style-type: none"> ▪ Dust Generation ▪ Dispersal of weeds ▪ Erosion and Sedimentation
Reuse (landscaping, mounds, mulching)	<ul style="list-style-type: none"> ▪ Dust Generation ▪ Dispersal of Weeds ▪ Erosion and Sedimentation
Topsoil and vegetation clearing	<ul style="list-style-type: none"> ▪ Noise ▪ Dust Generation ▪ Dispersal of Weeds ▪ Erosion and Sedimentation



5. Mitigation measures

This section outlines mitigation measures to mitigate the potential impacts identified in Section 4 as they relate to pre-construction, construction and post-construction phases of the project. The criteria these mitigation measures should meet and specific mitigation measures are identified in the CEMP. These should be revised against construction activities being undertaken and the site specific issues as they relate to a particular sub-plan and detailed mitigation measures should then be identified such as those below.

If further detail is required reference may also be made to relevant CoA including CoA 55, 59, 61 and 65 as advised by the Minister for Planning and through SoC 57 and 58 as committed by ARTC in the Environmental Assessment.

Table 5–1 below details the environmental controls and procedures that are proposed to mitigate the potential environmental impacts associated with spoil handling, material stockpiling, reuse and disposal.

Table 5–1: Mitigation measures

Mitigation measures	Responsibility	Source of requirement
Preconstruction		
<ul style="list-style-type: none"> ▪ Prepare a Construction Traffic Management Sub-Plan (CTMSP) in accordance with the CEMP. ▪ Integrate the CTMP with the Spoil and Fill Management Sub-Plan. ▪ Consult with Relevant Government Departments, the relevant road authority, and other relevant stakeholders. 	PD	CoA 55
<ul style="list-style-type: none"> ▪ Integrate Spoil and Fill Management Sub-Plan and Waste Management Sub-Plan. ▪ Integrate Hazard and Risk Management Sub-Plan and Waste Management Sub-Plan. 	PD	CoA 65
<ul style="list-style-type: none"> ▪ Specify the locations of major (defined as a volume greater than 500 cubic metres) spoil stockpiles; ▪ The source of imported fill material and where it will be stockpiled and used. ▪ Methods to re-use or dispose of excess or unsuitable spoil material including estimated volumes and disposal sites. 	PD	SoC 57
Construction		
<ul style="list-style-type: none"> ▪ Provide training for all personnel involved in construction 	CW-PM	



Mitigation measures	Responsibility	Source of requirement
<ul style="list-style-type: none"> ▪ Manage noise and vibration in accordance with the Noise and Vibration Management Plan ▪ Undertake all construction activities, including entry and departure of heavy vehicles, in accordance with the Construction Environmental Management Plan ▪ Undertake dust suppression measures in accordance with the Air Quality Management Plan ▪ Use water cart/s on site 	CW-PM	
<ul style="list-style-type: none"> ▪ Limit transport of spoil and fill material to movements within the railway corridor wherever possible and in accordance with this Plan ▪ Undertake haulage in accordance with this Plan, Construction Traffic Control Plan and the Traffic Management and Safety Plan (Design and Construction) ▪ Provide induction toolbox to haul companies regarding designated haul routes, and provide maps of these haul routes ▪ Transport fill material on public roads along approved designated routes ▪ Spoil loads will be covered before leaving the site ▪ Provide, and ensure use of, wheel cleaning facilities by all vehicles departing construction sites ▪ Monitor the use of designated haul routes to ensure other roads are not being used ▪ Implement disciplinary action for drivers who use non-designated haul routes, who park outside local shops and facilities, or who queue on local roads 	CW-PM	
<ul style="list-style-type: none"> ▪ Implement environmental controls related to fill handling, material stockpiling and reuse ▪ Ensure that sediment control structures are regularly maintained and managed (as per Erosion & Sediment Control Plan) ▪ Verify the source of all imported material ▪ Ensure dust control measures are implemented and managed (as per Dust Management Plan) ▪ Ensure that fill identified for reuse is stockpiled in identified locations and in accordance with the relevant CMS and this Plan ▪ Coordinate and monitor environmental mitigation works ▪ Complete checklists (refer to Annexure A) 	CW-PM	SoC 57
<ul style="list-style-type: none"> ▪ Reuse or recycle all clean and/or treated spoil, where possible to do so, in embankments and landscape and noise mounds etc ▪ Stabilise spoil reuse areas immediately with hydro seed to avoid the potential for erosion, sedimentation and dust 	CW-PM	



Mitigation measures	Responsibility	Source of requirement
<p>generation</p> <ul style="list-style-type: none"> ▪ Revegetate reuse areas in accordance with the Urban Design and Landscape Plan and the Flora and Fauna Management Plan ▪ Remove weed growth prior to reuse to prevent dispersal of weeds. Alternatively, remove weeds and place deep in mounds in accordance with the Flora and Fauna Management Plan 		
<ul style="list-style-type: none"> ▪ Soil contamination, including excavated soil which is odorous or stained or heterogeneous fill material containing anthropogenic materials, the Independent Geotechnical Engineer must be notified for testing of the materials to identify contamination and recommend suitability of material. 	PD	
<ul style="list-style-type: none"> ▪ Disposal of spoil if not contaminated as determined by the Independent Geotechnical Engineer, will be undertaken within the railway corridor and include creating permanent stockpiles, embankments and landscape mounds etc ▪ Contaminated material will be disposed in accordance with DECC requirements, which will be to a licensed facility ▪ Acid sulphate soils will be managed in accordance with the Acid Sulphate Soils Management Sub Plan ▪ Notification to regulatory authorities will be undertaken for disposal contaminated fill 	CW-PM	
<ul style="list-style-type: none"> ▪ Transported spoil off site must be covered to prevent dust or/and load lost in line with the Dust Management Sub Plan. 	CW-PM	CoA 59
<ul style="list-style-type: none"> ▪ Audit the implementation and maintenance of environmental management practices relating to spoil management ▪ Ensure that work conforms to the requirements to the relative permits, licences and approvals as outlined by the regulatory agency(ies) ▪ Provide training to staff and sub-contractors relating to spoil management ▪ Verify the location of stockpiles (temporary) and reuse areas 	CW-PM	CoA 65
<ul style="list-style-type: none"> ▪ Classify any material as being unsuitable for engineered fill and dispose of in correct manner as outlined in Waste Sub-Plan. 	CW-PM	CoA 65
<ul style="list-style-type: none"> ▪ All material excavated from Construction will be re-used or recycled unless unsuitable. ARTC will ensure that the re-use of material generated from construction is maximised in preference to importing fill. 	CW-PM	SoC 58
<ul style="list-style-type: none"> ▪ The following general stockpile management and mitigation measures will be conducted as follows: 	CW-PM	SoC 57



Mitigation measures	Responsibility	Source of requirement
<ul style="list-style-type: none"> ▶ Construct erosion and sediment controls around stockpiles and immediately down-slope of any excavation areas to minimise siltation and sedimentation; ▶ Separately stockpile different materials; ▶ Separate different soil and earth layers to minimise the opportunity for mixing of soil types; ▶ Water (as required) soil and spoil stockpiles to keep them moist and minimise dust and wind erosion; ▶ Minimise the size of stockpiles and bund or cover stockpiles at the end of each day; ▶ No stockpiling of material near roadways or stormwater drains. 		
<ul style="list-style-type: none"> ▪ Inspect stockpile areas weekly to ensure sediment control and dust mitigation measures are adequate. ▪ Inspection of sediment controls will be in accordance with monitoring detailed in the Erosion & Sediment Control Plan 	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



5.1 Management measures and mitigation strategies

5.1.1 Separately stockpile different materials

There will be at least five (5) different types of Spoil/fill material that will need to be stockpiled separately. It is important to ensure that these separate classifications of spoil/fill and not cross contaminated and hence they will require careful treatment with clearly indicated separate stockpiling location shown at each major stockpiling location.

The separate stockpiles will include:

- Virgin material (cut stone etc.) for Fill
- Select material (Fill)
- Unsuitable for Fill material (possibly to landscaping if appropriate)
- Top Soil (to be reused in landscaping)
- Contaminated Spoil

Please refer to the relevant sections of this plan for details on how each of these separate types of material will be used or disposed of, treatment Contaminated Spoil is dealt with in both the Hazards and Risk Management Sub-Plan and the Waste Management Sub-Plan.

5.1.2 Storage of Fill

The Project Environmental Manager and Project Engineer will identify storage areas prior to commencement of construction in each area to ensure that disturbance to local residents is minimised, local amenity is maintained and to protect receiving waters from potential runoff.

Temporary stockpile areas will be located:

- close to future use areas
- within the corridor
- on the contour and at least 15 metres and where possible up to 50 metres from waterways and drainage lines
- on relatively flat land
- in areas with a small water catchment e.g. crowns/ridges
- away from threatened plant species and fauna habitat areas
- away from steep slopes and gullies
- upstream of sediment basins
- so that material is easily accessible and may be retrieved at any time.

Compliance with these requirements may be difficult in some locations due to site constraints such as narrow corridors; priority to retain vegetation; sensitive areas and the presence of threatened species. In these cases stockpile locations and management of stockpiles will be assessed on a case-by-case basis on their merits to minimise and manage the risks.



The majority of fill will be stockpiled at the following locations:

- The Former Liverpool City Council Golf Club at Casula
- Unused Army land south of Casula
- Land acquired for construction of the Glenfield flyovers

The actual quantise of fill to be stored at each stockpile area will be confirmed closer to the start of construction.

5.1.3 Re-use of Unsuitable Spoil

Methods to re-use or dispose of excess or unsuitable spoil material including estimated volumes and disposal sites have been considered. Spoil that is unsuitable for construction will be used, when possible, in the landscaping of embankments. Material that is unsuitable for this purpose (ie too clayey etc) will be disposed of at a local construction waste disposal centre (eg Glenfield Tip). The exact quantities of material that will be usable or must be disposed of is yet to be determined and will be established based on on-site analysis of the material when excavated and again prior to potential use in landscaping.

The different soil types (sand, clay, soil, rocky soil etc.) should be separated, when possible, before stockpiling to enable easier reuse in landscaping.

5.1.4 Management of Stockpiles

All stockpiles will require ongoing management to ensure that erosion, contamination, and dust generation does not occur. Where stockpiles can not be sown (with grasses) as it will be reused quickly, then the stockpile will need to be covered (when not in use) and watered when in use. Bunding is recommended around any stockpile that will require regular watering or that is within 50m of a watercourse. (Note that no stockpiling is permitted inside of 15m of a watercourse or stormwater drain).

Watering down of stockpiles will occur:

- Immediately after dry material has been added to the stockpile
- Immediately after material has been sourced if the remaining material appears dry and dusty
- Whenever the temperature is hot enough to dry out the stockpile and potentially generate dust
- When cover on the stockpile has been removed and the material underneath appears dry
- Whenever dust can be seen blowing from the stockpile
- Weekly if the stockpile is grassed.

Watering is to be undertaken on site from either water trucks or fixed spray systems. Water is to be sourced from detention basins and sedimentation ponds along the construction site or other



approved water sources if required (Consultation with DWE required only if alternative water sources are required).

Re-covering or re-bunding will be required at the end of each working day if covers or bunds have had to be removed to access the stockpile.

Stockpiles will not be located adjacent to public roads as access to the stockpile must be attained on site, for both deposition and collection. All vehicles accessing the stockpiles must be treated for dust management (in accordance with the Dust Management Sub-Plan) before leaving the site and hence, adequate space to achieve this will be required. All stockpiles must be located at least 10m from a public road and must be securely fenced, with appropriate material lining the fence to prevent spillage through the fence or dust generation.

5.1.5 Storage of Topsoil

Topsoil will be collected, stockpiled and managed in the same way as spoil as outlined above. The environmental controls and procedures are outlined in Table 5–2 listed by activity.

Table 5–2 The Environmental Manager will ensure that:

- topsoil stockpiles are protected against wind and water erosion
- topsoil is stockpiled in low, flat elongated embankments less than 2 metres high and spoil stockpiled not more than 4 metres high
- catch drains are located on the elevated side of the embankment to divert any local runoff
- sediment fences are located on the low side of the embankment to catch sediment-laden runoff from the stockpile, consistent with the Soil and Water Management Plan
- topsoil stored for extensive periods of time will be seeded

The relevant CMS will show topsoil stockpile locations. Topsoil not planned for use in less than 30 days will be grassed within ten days of establishment using a hydro-mulch of sterile cover crop or another appropriate technique. The Environmental Officer will undertake inspections of the topsoil stockpiles on a weekly basis, except after heavy rain events or strong winds when they will be checked after each event.



5.1.6 Hauled Fill

Approximately 533,500 m³ of fill will be required to be hauled by road trucks between the site of the Sefton Dive and the embankment widening works further south along the works corridor. While haul of this material within the Project corridor will be maximised, it is anticipated that a proportion of this material will need to be hauled by road.

For any fill material hauled by road, including any imported select material, the local Site Manager will ensure that:

- All loads exiting a Project construction site are securely covered
- Suitable wheel cleaning facilities are available at the exit points from all construction sites
- Dust suppression measures are undertaken for loading and unloading of fill if excessive dust is being generated as detailed in the Dust Management Sub-Plan
- Management of received spoil is in accordance with the relevant CMS
- Hauling of fill is undertaken strictly in accordance with the CoA and any subsequent approvals

5.1.7 Independent Verification

ARTC will engage an independent Geotechnical Engineer to verify the suitability of spoil material for use as fill as follows:

- Geotechnical investigation, laboratory testing and assessment to predict the suitability of on-site materials in cut or fill areas for re-use;
- Development of Investigation Reports;
- Advise and recommend blending requirements for on-site materials;
- Advise technical requirements of fill material to ensure optimum placement by earthworks contractor;
- Evaluate the merits of stabilising materials where required;
- Verification of sub-grade materials for embankment construction;
- Site support for geotechnical related works;
- Advise ARTC during regular co-ordination meetings; and
- Independent monitoring and auditing of earthworks contractors.



Table 5–2 listed by activity.

Table 5–2: Environmental Controls and Procedures for Spoil and Fill Management

ACTIVITY	ACTIONS	RESPONSIBILITY	TIMING
Pre-excavation	<ul style="list-style-type: none"> ▪ Provide training for all personnel involved in construction 	<ul style="list-style-type: none"> ▪ Environmental Manager 	<ul style="list-style-type: none"> ▪ Prior to commencement of construction
Excavation	<ul style="list-style-type: none"> ▪ Manage noise and vibration in accordance with the Noise and Vibration Management Plan ▪ Undertake all construction activities, including entry and departure of heavy vehicles, in accordance with the Construction Environmental Management Plan ▪ Undertake dust suppression measures in accordance with the Air Quality Management Plan ▪ Use water cart/s on site 	<ul style="list-style-type: none"> ▪ Environmental Manager 	<ul style="list-style-type: none"> ▪ At all times
Transport	<ul style="list-style-type: none"> ▪ Limit transport of spoil and fill material to movements within the railway corridor wherever possible and in accordance with this Plan ▪ Undertake haulage in accordance with this Plan, Construction Traffic Control Plan and the Traffic Management and Safety Plan (Design and Construction) ▪ Provide induction toolbox to haul companies regarding designated haul routes, and provide maps of these haul routes ▪ Transport fill material on public roads along approved designated routes ▪ Spoil loads will be covered before leaving the site ▪ Provide, and ensure use of, wheel cleaning facilities by all vehicles departing construction sites ▪ Monitor the use of designated haul routes to ensure other roads are not being used ▪ Implement disciplinary action for drivers who use non-designated haul routes, who park outside local shops and facilities, or who queue on local roads 	<ul style="list-style-type: none"> ▪ Project Engineer 	<ul style="list-style-type: none"> ▪ At all times
Storage and stockpiling	<ul style="list-style-type: none"> ▪ Protect and store reusable material in mounds ▪ Separately stockpile different materials ▪ Separate different soil and earth layers to minimise the opportunity for mixing of 	<ul style="list-style-type: none"> ▪ Project Engineer 	<ul style="list-style-type: none"> ▪ At all times



ACTIVITY	ACTIONS	RESPONSIBILITY	TIMING
	<p>soil types</p> <ul style="list-style-type: none"> ▪ Sediment Control structures around stockpiles will be maintained and inspected on a weekly basis and/or after heavy rain events ▪ Maintain sediment control structures around stockpiles and inspect weekly and after each storm event to ensure sediment controls remain effective over the duration of the disturbance and/or until a stable cover crop is established ▪ Inspect stockpile areas on a weekly basis to identify potential sources of sediment loss and dust ▪ Where dust generation is identified as a management issue, protect stockpiles from water and wind erosion by spreading with seed until they are required or by covering them with geo-textile fabric ▪ Water as required soil and spoil stockpiles to keep them moist and minimise dust and wind erosion 		<ul style="list-style-type: none"> ▪ After each storm event ▪ Weekly ▪ Once stockpile is established
Reuse	<ul style="list-style-type: none"> ▪ Reuse or recycle all clean and/or treated spoil, where possible to do so, in embankments and landscape and noise mounds etc ▪ Stabilise spoil reuse areas immediately with hydro seed to avoid the potential for erosion, sedimentation and dust generation ▪ Revegetate reuse areas in accordance with the Urban Design and Landscape Plan and the Flora and Fauna Management Plan ▪ Remove weed growth prior to reuse to prevent dispersal of weeds. Alternatively, remove weeds and place deep in mounds in accordance with the Flora and Fauna Management Plan 	<ul style="list-style-type: none"> ▪ Project Engineer 	<ul style="list-style-type: none"> ▪ At all times ▪ Once spoil is placed ▪ At all times ▪ Prior to reusing topsoil
Disposal	<ul style="list-style-type: none"> ▪ Disposal of spoil if not contaminated as determined by the Project Engineer, will be undertaken within the railway corridor and include creating permanent stockpiles, embankments and landscape mounds etc ▪ Contaminated material or acid sulfate prone soil will be disposed in accordance with DECC requirements, which will be to a licensed facility ▪ Notification to regulatory authorities will be undertaken for disposal contaminated fill 	<ul style="list-style-type: none"> ▪ Project Engineer 	<ul style="list-style-type: none"> ▪ As required



6. Monitoring and reporting

Mitigation measures and management programs as outlined in Table 5–2 will be inspected, reviewed and updated on a regular basis by the Project management team. The review will be dependent on spoil movement and fill generation. Review results would be adopted into the CMS and communicated to staff through toolbox meetings.

The items listed in the checklist detailed in Annexure A are discussed in the above sections. This checklist will be completed monthly to ensure that all safeguards are complied with.



Table 6–1: Monitoring and reporting requirements

Monitoring and reporting requirements	Responsibility	Source of requirement
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	CoA 61
<ul style="list-style-type: none"> ▪ Check soil sedimentation and fill storage structures are in place before construction activities commence. 	CW-PM	SoC 57
Construction		
<ul style="list-style-type: none"> ▪ The following inspections and checks must be completed by a project engineer with expertise in spoil and fill management on a regular basis: <ul style="list-style-type: none"> ▶ undertake inspections of temporary and permanent erosion and sedimentation control devices ▶ check dust management control are implemented ▶ check spoil and fill locations on ground match detailed designs for location, depth and gradient and other parameters as required ▶ Undertake weekly monitoring of environmental controls for all temporary and permanent fill storage ▶ Undertake inspections on a weekly basis and following storm events to monitor the functioning of erosion and sediment control measures ▶ Record, respond and report on community complaints/issues, and non-conformances as required. ▪ Report the results of these inspections and any follow-up actions in the Construction Compliance Reports. 	CW-PM	SoC 57
<ul style="list-style-type: none"> ▪ Site investigation reports (as required) ▪ Monitoring and site auditing reports (monthly) 	Independent Geotechnical Engineer	
Post-construction		
<ul style="list-style-type: none"> ▪ Check that progressive rehabilitation activities of spoil and fill are undertaken. 	EM	SoC 57
<ul style="list-style-type: none"> ▪ Ensure sediment and erosion controls are removed on completion of the rehabilitation works. 	EM	SoC 57

- End of Table -

Note: EMR: Environmental Management Representative
PD: ARTC Project Director
CM: Construction Manager
DM: Design Manager
EM: Environment Manager



Monitoring and reporting requirements	Responsibility	Source of requirement
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*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 Spoil and Fill Checklist (Annexure A) will provide assistance in identifying issues requiring corrective action.



8. Document control

The Spoil and Fill Management Sub-Plan will be reviewed and amended, if required or if the activities change, and reissued as soon as possible.

The Spoil and Fill Management Sub-Plan will be issued to all Construction Supervisors by the Project Manager. All project staff will be notified of changes made to this Sub- Plan by their Construction Supervisors.



Annexure A: Spoil and Fill Checklist

Project: SSFL Project

Inspection Date: **Area/Location:**

	Control Measure	Yes	No	N/A	Comments / Corrective Action
1	Is the quantity of cut-to-fill and cut-to-spoil material being recorded?				
2	Is the use of spoil material generated by construction maximised in preference to importing fill?				
3	Are only designated and approved haul routes and access points being used?				
4	Are water carts available and being used to suppress dust in areas of disturbance and during loading/tipping operations?				
5	Are spoil, mulch and topsoil stockpiles located in accordance with the Spoil & Fill Management Sub-Plan and relevant CMS?				
6	Are spoil storage areas stabilised immediately to avoid erosion potential, sedimentation and dust generation?				
7	Are temporary stockpiles protected from water & wind erosion by spreading with seed or covering with geotextile fabric?				
8	Are sediment control structures around stockpiles maintained regularly?				
9	If required, are loads exiting the site securely covered?				
10	Are trucks parking/queuing on local roads?				
11	Are trucks parking queuing outside local shops, facilities etc?				
12	Are truck cleaning facilities available and being used to clean trucks prior to departing the site?				
13	Have all non-conformance events been recorded and reported in accordance with the requirements of this Management Plan?				

Completed by:

Signature:

