NORTHWEST RAPID TRANSIT

PROJECT INTEGRATED MANAGEMENT SYSTEM

SPOIL MANAGEMENT PLAN

FOR

NORTH WEST RAIL LINK
OPERATIONS, TRAINS and SYSTEMS PPP

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Spoil Management Plan Approval Records

Approval Record

FUNCTION	POSITION	NAME	SIGNATURE	DATE
Reviewed by	Environment Manager	Peter Monsted		12.11.18
Reviewed by	Infrastructure Director	David Jackson		12-11-18
Reviewed by	Trains & Systems Director	Roger Ho		18-11-18
Reviewed by	D&D Director	Malachy Breslin		19/11/18
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Approved by	NRT CEO	Mark Elliott		29/11/18

Amendment Record

Changes made to this document since its last revision, which affect its scope or sense, are marked in the right margin by a vertical bar (|).

DATE	REV	AMENDMENT DESCRIPTION	BY	INITIALS
04/03/2016	02.01	Updated to include Norwest Pedestrian Link works and 33kV Underground Feeder Powerline works	Alex Bamford Cameron Newling	AB CN
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1 Introduction

This *Spoil Management Plan* (SMP) outlines the construction environmental management arrangements by which Northwest Rapid Transit (NRT), in partnership with Transport for NSW (TfNSW), is delivering the Operations, Trains and Systems Public Private Partnership (OTS PPP) component of the Northwest Rail Link (NWRL) Project, now renamed as 'Sydney Metro Northwest'.

Note: In June 2015, TfNSW changed the project's name to Sydney Metro Northwest (from the North West Rail Link) to reflect its role in Sydney's new railway network. Any references to the Northwest Rail Link in this plan can be assumed to be referring to the Sydney Metro Northwest

1.1 OTS PPP

Sydney Metro is Australia's largest public transport project. Sydney Metro Northwest, formerly known as the North West Rail Link, is the first stage of Sydney's new fully-automated metro system and will open to customers in the first half of 2019.

Stage 2, Sydney Metro City & Southwest, will extend metro rail under Sydney Harbour, through the CBD and southwest to Bankstown.

The $8.3 billion Sydney Metro Northwest will deliver eight new railway stations and 4,000 commuter car parking spaces to Sydney's growing North West. Services will start with a train every four minutes in the peak. The project also includes the upgrade and conversion of five existing railway stations to metro standards.

The Operations, Trains and Systems (OTS PPP) contract is a 15-year Public Private Partnership project – the largest in the history of New South Wales as well as the largest of the three delivery contracts for Sydney Metro Northwest.

Northwest Rapid Transit is delivering Sydney's new generation metro trains; building the new stations and car parks; installing tracks, signalling, mechanical and electrical systems; building and operating the Rapid Transit Rail Facility at Tallawong Road; upgrading and converting the railway between Epping to Chatswood to rapid transit standards; and operating Sydney Metro Northwest – including all maintenance work.

1.2 Purpose and Application

This *Spoil Management Plan* (SMP) describes how the Northwest Rapid Transit (NRT) team will manage spoil during Phase 1, ECRL Conversion, Phase 2, Norwest Pedestrian Link, 33kV Underground Feeder Powerline Works and Rouse Hill Temporary Bypass Powerline works of the delivery of the North West Rail Link (NWRL) Operations & Train Systems contract.

Figure 1 below illustrates the delineation of the Phase 1, ECRL Conversion and Phase 2 of the OTS Works.

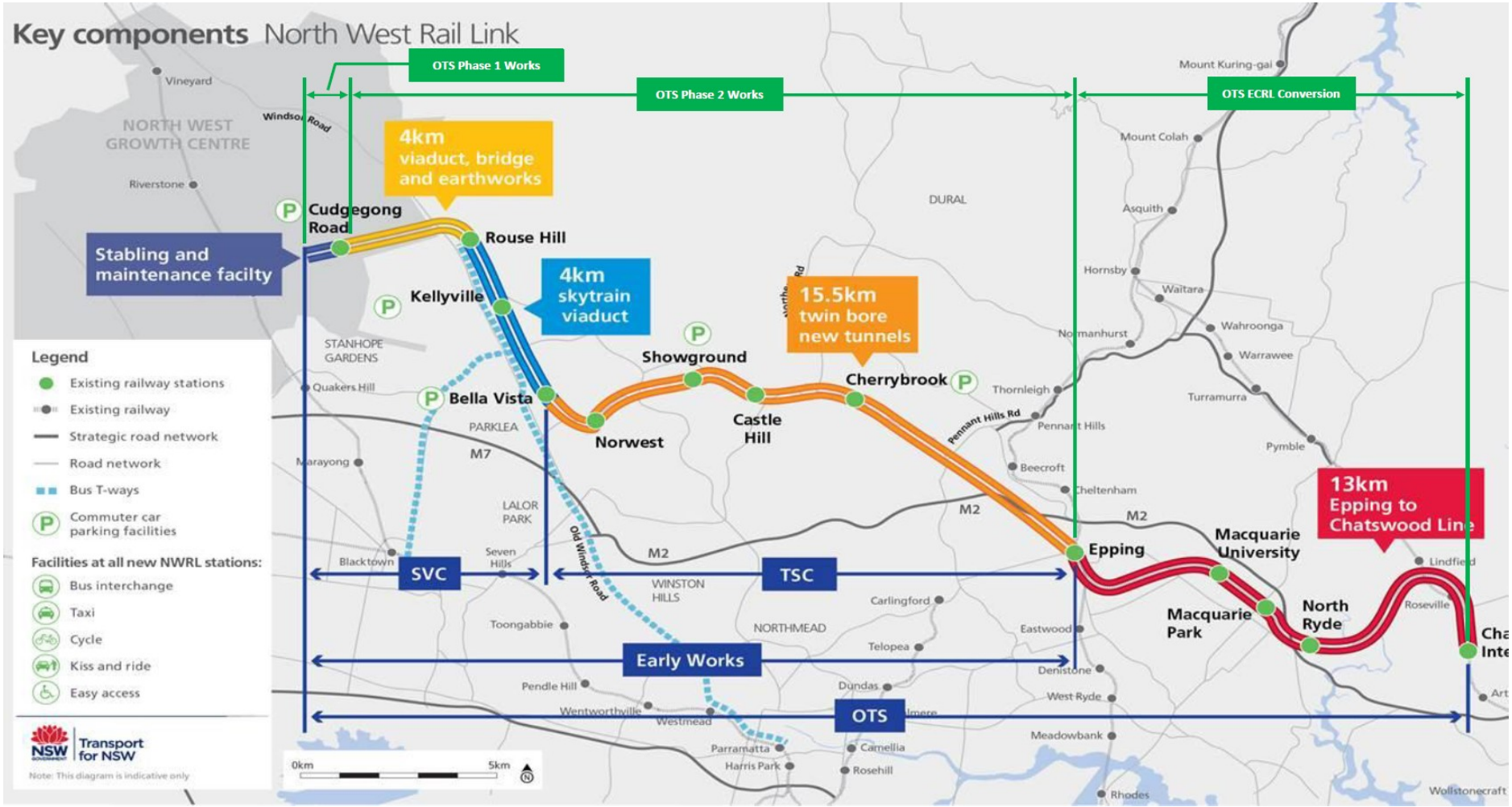

Figure 1 Schematic of NWRL OTS Phase 1, ECRL and Phase 2 Works

In summary, NWRL OTS Phase 1 covers the works associated with the delivery of the NWRL Rapid Transit Rail Facility and the Cudgegong Precinct Enabling Works– see Figure 2 below.

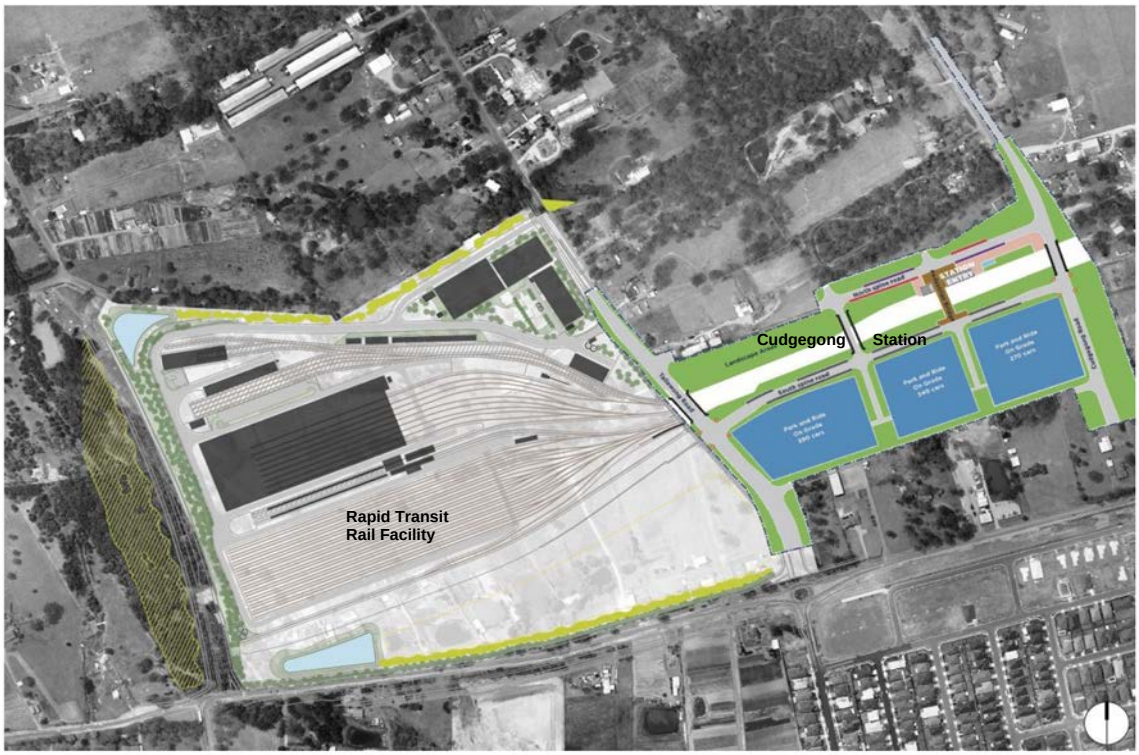

Figure 2 Indicative Layout of NWRL OTS Phase 1 Site: RTRF and Cudgegong Station

The ECRL Conversion works refer to the conversion of the existing Epping to Chatswood Rail Line to rapid transit. See Figure 3 below.

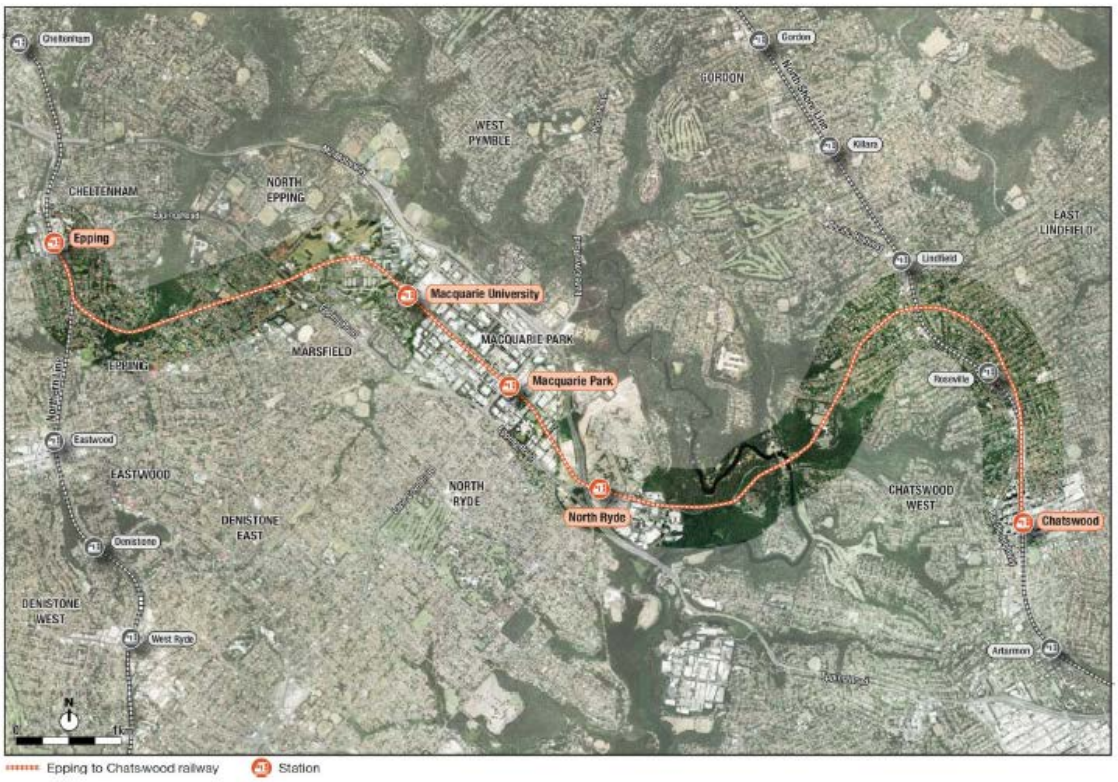

Figure 3 Indicative ECRL Conversion Works Area

Phase 2 Works refer to the construction of:

- New railway stations and precincts at Rouse Hill, Kellyville, Bella Vista, Norwest, Showground, Castle Hill and Cherrybrook (connecting to the Phase 1 works to the west and ECRL conversion works to the south-east. These works include the major civil construction work areas, including but not limited to the seven stations sites and six sites associated with the above rail corridor from Bella Vista to the Phase 1 work areas.
- Services facilities at Cheltenham and Epping
- Rail infrastructure and systems
- Infrastructure such as road works, pedestrian/cycle facilities, landscaping associated with construction of precincts and stations.

The scope of Phase 2 Works is demonstrated in Figure 4 below. Phase 2 is shown as the new NWRL alignment (green alignment) with ECRL conversion works shown as the existing alignment (blue alignment).

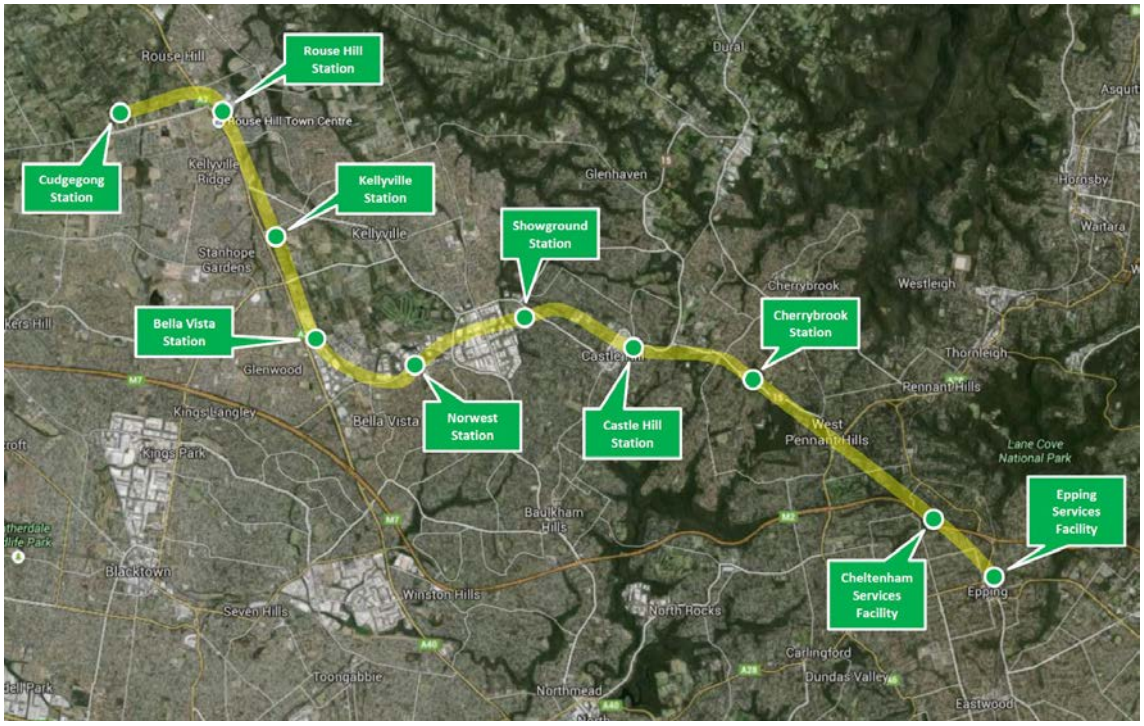

Figure 4 Indicative NWRL OTS Phase 2 Works Area

Norwest Pedestrian Link works refer to the installation of an underground pedestrian link and second station entry on the northern side of Norwest Boulevard at Norwest Station. See Figure 5 below.

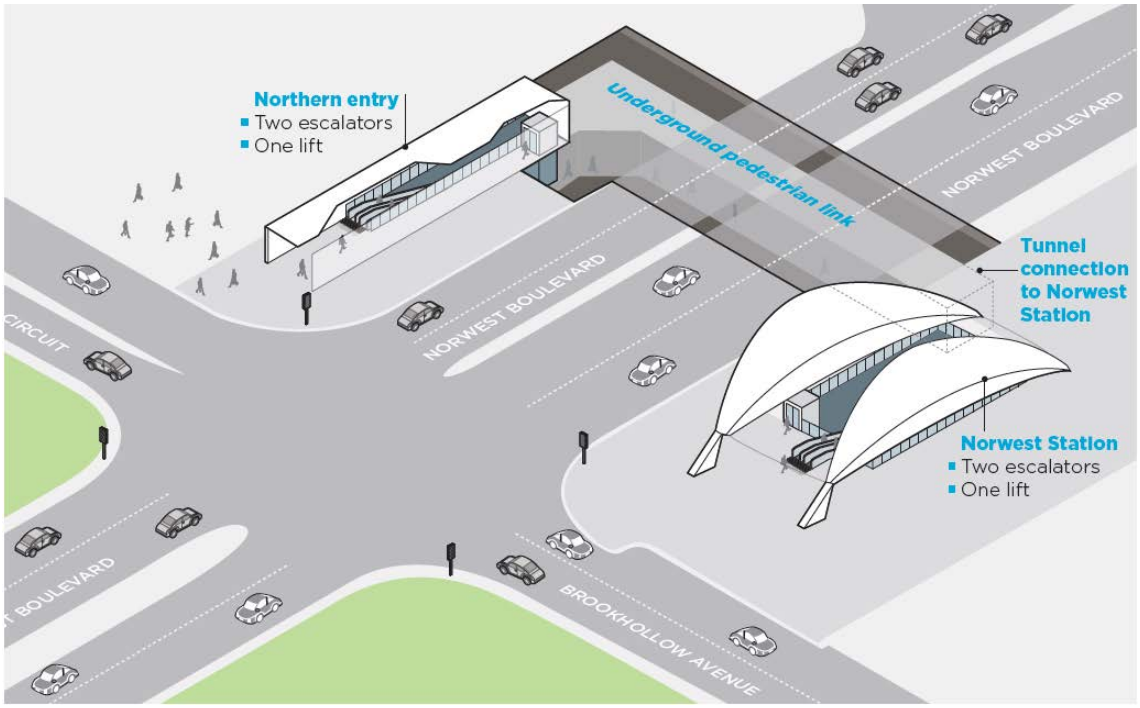

Figure 5 Artist Impression of the Underground Pedestrian Link

The 33kV Underground Feeder Powerline works refer to the building and maintaining a new five kilometre 33kV feeder power line between Ausgrid's Willoughby Subtransmission Substation and the TfNSW Chatswood North Traction Substation.

The proposal is required to provide dedicated, independent 33kV connection in order to meet the reliable supply of electricity requirements for this project. See Figure 6.

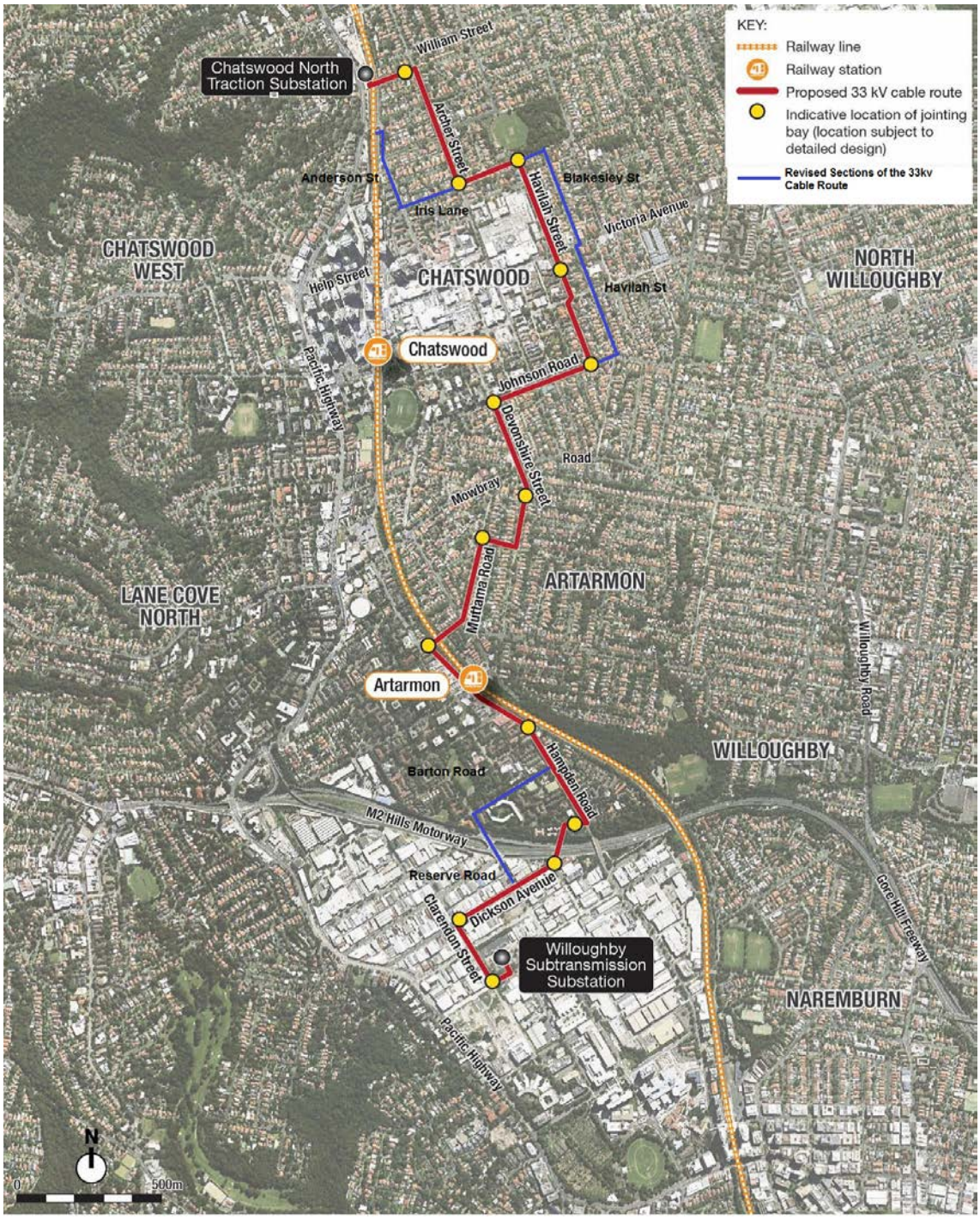

Figure 6 Overview of the 33kV Underground Feeder Powerline Route

The Rouse Temporary Bypass Powerline involves the construction of a temporary powerline from the southern side of the Sydney Metro Windsor Road Bridge crossing Schofields Road, running underground through Castlebrook Memorial Park transitioning back to overhead and crossing Windsor Road to the Rouse Hill traction substation located south of Sanctuary Drive. The purpose of the temporary powerline is to enable energisation and commissioning of the rail systems associated with the construction of Sydney Metro Northwest. See Figure 7 below:

Figure 7 Rouse Hill Temporary Bypass Power Work Area

Specifically, this Sub Plan:

- Describes the legislative framework specific to spoil management
- Defines the procedures that will be implemented by the NRT to ensure there are no adverse impacts on the environment due to spoil management
- Identifies potential for the reuse and recycling of spoil during the construction process
- Defines procedures for monitoring, checking and implementing corrective actions in the event of an unacceptable impact

This Plan is a sub plan of the Phase 1, ECRL Conversion, Phase 2, Norwest Pedestrian Link, 33kV Underground Feeder Powerline Works Construction and Rouse Hill Temporary Bypass Powerline Environmental Management Plan (CEMP). The relationship of this Plan to other NRT Plans is described in detail below in Section 1.4

1.3 Scope and Objectives

This SMP addresses the following requirements

- OTS Project Deed, Operations, Trains and Systems, Exhibit 1, Scope and Performance Requirements, Appendix 54 – Project Plan Requirements, Section 3.17
- Project Planning Approval - Rapid Transit Rail Facility (ref SSI-5931) – All Conditions applicable to Phase 1 NWRL OTS works.
- Project Planning Approval (and Modification 20 May 14) – NWRL Stage 2 – Stations, Rail Infrastructure & Systems (SSI-5414) – applicable to Phase 1 NWRL OTS works, as defined in Staging Report
- ECRL Conversion Determination Report Conditions of Approval

- Applicable Environmental Management Measures from Project EISs:
- Environmental Impact Statement 2 (EIS2) and Submissions Report (including – NWRL Stage 2 Stations, Rail Infrastructure and Systems (2012/3);
- Environmental Impact Statement and Submissions Report – Tallawong Road, Rouse Hill Rapid Transit Rail Facility (RTRF, 2013).
- ECRL Conversion Review of Environmental Factors (Parsons Brinkerhoff, 10 October 2014) and Submissions Report (Parsons Brinkerhoff, 5 February 2015)
- Norwest Pedestrian Link Review of Environmental Factors (Parsons Brinkerhoff 4 June 2015) and Submissions Report (Parsons Brinkerhoff, 1 October 2015)
- Norwest Pedestrian Link Determination Report Conditions of Approval
- Willoughby to North Chatswood 33kV Underground Feeder Powerline Review of Environmental Factors (Parsons Brinkerhoff 20 October 2015) and Submissions Report (Parsons Brinkerhoff 9 March 2016)
- 33kV Underground Feeder Powerline Determination Report Conditions of Approval
- Rouse Hill Temporary Bypass Powerline Environmental Impact Assessment (EIA)
- NWRL Construction Environmental Management Framework (Rev1.3)
- Applicable Legislative Obligations.

The Compliance Matrix in details how the SMP complies with the requirements of the applicable CoAs requiring the Plan to be prepared, consulted and approved.provides a comprehensive list of compliance requirements, environmental documents and the contract documents. Additional detail on compliance management is also contained in Section 2.2.

NRT's spoil management objectives & targets for the delivery of the Phase 1, ECRL Conversion, Phase 2, Norwest Pedestrian Link, 33kV Underground Feeder Powerline works of the OTS Contract are:

The beneficial reuse of spoil from the project will target 100 per cent reuse or recycling (on or off-site) of usable spoil.

- Spoil will be managed with high consideration to minimising adverse traffic and transport related issues.
- Potential contamination of land or water from contaminated spoil will be avoided.
- Spoil will be managed with consideration of the impacts on residents and other sensitive receivers.
- Site contamination will be effectively managed to limit the potential risk to human health and the environment.

These objectives conform to TfNSW's objectives as described in the NWRL Construction Environmental Management Framework.

1.4 NRT Environmental Management System

In accordance with the OTS Project Deed, Exhibit 1, Scope and Performance Requirements, Section 5.2, NRT must implement and maintain an effective Management System, which addresses all its obligations under the Deed.

The Management Systems must seamlessly integrate all NRT's systems and processes, including those related to rail safety and rail accreditation quality, environmental, sustainability, health and safety and they must accommodate, coordinate and give effect to the Project Plans.

Details of NRT's Integrated Management System including the integrated relationship of the SMP with the other Project Plans and with the delivery Core Processes are contained in the Project Management Plan. As improvements are made to the processes and systems, these will be reflected in updates to the relevant Project Plans. All elements of the Integrated Management System will reside on Aconex as controlled copies. An intranet will contain a front page to the Integrated Management System with links between documents, processes and forms utilising the Aconex search engine.

1.5 Approval Before Submission

The *SMP* and future updates are to be approved by NRT's CEO before being submitted to TfNSW.

1.6 Certification by Independent Certifier

This SMP and any future update is to be submitted, in accordance with the provisions of clause 8 of the Deed, to TfNSW for comment and to the OTS Independent Certifier for certification prior to its implementation by NRT.

1.7 Update and Ongoing Development

The *SMP* is incorporated as Appendix 76 of the Deed.

The *SMP* will be updated regularly in accordance with the requirements of the *Deed,* clause 8 and annually as required in *Exhibit 1, Scope and Performance Requirements, Appendix 54 – Project Plan Requirements, Table 1.*

NRT will undertake the ongoing development, amendment and updating of the *SMP* to ensure it remains consistent with Project priorities, risk management, client requirements and Project objectives, taking into account:

- The status and progress of NRT's activities
- Changes in the design, delivery and operations processes and conditions
- Lessons learnt during delivery and operations
- Changes in other related Project Plans
- Requirements and matters not covered by the existing Project Plans
- Changes to Plans resulting from any comments from the OTS Independent Certifier
- Changes to Project Plans as directed by TfNSW's Representative under the Deed.

2 Legal and Other Requirements

2.1 Relevant Legislation

Key legislation relevant to spoil management includes:

- *Environmental Planning and Assessment Act 1979*
- *Protection of the Environment Operations Act 1997*
- *Waste Avoidance and Resource Recovery Act 2001*
- *Roads Act 1993*
- *Contaminated Land Management Act 1997*

Refer to the Construction Environmental Management Plan for details of the relevant legislation.

2.2 Compliance Requirements

Relevant planning requirements from the Conditions of Approval are summarised in the Compliance Matrix in.

Additional spoil management requirements from the Project Deed, Project Approval and Revised Environmental Management Measures are included in

All compliance requirements associated with this sub plan including the Revised Environmental Management and Mitigation Measures from the NWRL Project Environmental impact assessments, the ECRL Conversion Determination Report and Submissions Report, the Norwest Pedestrian Link Determination Report and Submissions Report and the Willoughby to North Chatswood 33kV Underground Feeder Powerline Determination Report and Submissions Report that are pertinent to this sub plan are tracked and reported via the OTS compliance tracking program developed in accordance with CoA D5((a)-(h)).

The spoil reuse hierarchy referred to in the RTRF EIS is detailed below in order of preference:

- For environmental works
- Other development projects
- Land restoration
- Landfill management.

2.3 Relevant Guidelines

- Additional guidelines and standards relating to the management of spoil include:
- Waste Classification Guidelines, Part 1: Classifying Waste(EPA, November 2014)
- Waste Classification Guidelines, Part 4: Acid Sulphate Soils (DECC August 2009)

- Australian and New Zealand Guidelines for Assessment and Management of Contaminated Sites (ANZECC/NHMRC 1992)
- Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (EPA 1998)
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA 1997a)
- Contaminated Sites: Sampling Design Guidelines (EPA 1995b)
- Acid Sulfate Soil Manual (NSW Acid Sulphate Soil Management Advisory Committee 1998).

2.4 Licensing and Approvals

NRT has obtained an EPL and all works must be carried out in accordance with the EPL.

The principal obligations governing the handling of spoil has been specified in the Environment Protection Licence (EPL) – relevant conditions related to spoil are contained in.

Waste applied to land, (e.g. depositing, raising or filling land with waste received from off-site) is identified as a scheduled activity and the placement of material off site may require a new EPL to be obtained, unless it is Virgin Excavated Natural Material (VENM) which is exempt. If material meets the EPA testing criteria for Excavated Natural Material (ENM) an exemption from the EPA may be obtained to place that material lawfully on the subject property, subject to meeting the requirements of the ENM exemption.

Section 143 of the POEO Act requires the lawful disposal and transport of any waste material and also requires the landowner who is accepting any material to complete a Section 143 Certificate, authorising the acceptance of the material.

3 Roles and Responsibilities

3.1 Key NRT Personnel

The roles and responsibilities of key NRT Personnel with respect to spoil are as follows:

Table 1 Roles and Responsibilities

Project Director	Managing the delivery of the NRT Works including overseeing implementation of spoil management Act as Contractor's Representative
Environment Manager (EM)	Oversee the implementation of spoil management initiatives. Responsible for managing ongoing compliance with the CoA and environmental document requirements
Commercial Manager	Ensure that relevant spoil management requirements are considered in procuring materials and services
Construction Managers Site Superintendent (SS)	Manage the delivery of the construction process, in relation to spoil management across all sites in conjunction with the Environment Manager
Sustainability Manager	Track and report spoil reuse against sustainability targets
Environment Coordinators (EC)	Manage the on-ground application of spoil management measures during construction Monitor and report on spoil management during construction
Project Engineers	Implement spoil management practices during construction works
Specialist Consultant	Specialist consultants will be engaged to undertake investigations and respond to unexpected finds

4 Aspects and Potential Impacts

The key aspects and potential impacts associated with the management of spoil during the delivery of the OTS works are listed in Table 2.

Table 2 Summary of Overall Aspects and Potential Impacts

Aspects	Potential impacts/opportunities	Risk level for Works (qualitative)
Air quality	• Dust from stock piles, haul trucks and access roads may reduce air quality	M
Community	• Cumulative impacts of aspects associated with spoil management generate complaints	L
Contamination	• Previously unidentified contaminated spoil may impact on construction activities or environmentally sensitive areas	L
Design specifications	• Limitations on opportunities to minimise spoil generation	L
Erosion	• Increased erosion potential as a result of spoil excavation and management	M
Groundwater	• Moisture content of spoil may impact on spoil reuse potential and spoil management requirements • Salinity may limit spoil reuse opportunities	L
Land use	• Licensing and approval requirements may impact on availability of potential beneficial reuse sites	M
Noise	• Disturbance of sensitive receivers as a result of noise associated with spoil management	M
Sedimentation	• Potential for sediment-laden site runoff from spoil stockpiles	M
Sustainability	• Availability of suitable reuse sites decreases volume for beneficial reuse • Distance to beneficial reuse or disposal sites increases the carbon footprint	M
Weed management	• Potential for spread of weeds during spoil movement.	M

5 Spoil Volumes and Characterisation

5.1 Phase 1 Works

5.1.1 Spoil Volumes

The total volume and type of spoil to be produced at each of the construction sites (precinct or work area) has been calculated using the information available from the environmental and design documents. Following completion of a comprehensive site survey, the volume of each spoil type and the potential for beneficial reuse both on and off site will be refined as part of the detailed design process. Initial spoil volumes and types are displayed in Table 3 Spoil Volumes by Worksite below.

Table 3 Spoil Volumes by Worksite

Area	Cut (m^3)	Fill(m^3)	Area(m^2)	Strip(250mm)	Overburden(m^3)	Easy Rip(m^3)	Hard Rip(m^3)	Hammer(m^3)
1	273,500		73,900	18,475	134,200	31,600	95,200	12,500
2		380,880	117,500	29,375				
3	6,400	600	10,400	2,600	4,900	1,500		
4		102,600	49,500	12,375				
5		25,500	9,900	2,475				
6	18,500	900	11,400	2,850	6,300	4,900	4,800	2,500
7	218,000	2,000	51,000	12,750	91,500	50,400	33,200	42,900
Total	**516,400**	**512,480**	**323,600**	**80,900**	**236,900**	**88,400**	**133,200**	**57,900**

5.1.2 Spoil Characteristics

The geotechnical conditions at the site generally consist of:

- Very Stiff to hard residual clay down to approximately 1 to 2m depth.
- Moderately to extremely weathered, Class III to IV Minchinbury Sandstone, down to approximately 6 to 8m depth.

Slightly weathered to fresh, Class I and II Mulgoa Laminite (subgroup of Ashfield Shale) below 6 to 8m.

Spoil produced is predominantly expected to be Virgin Excavated Natural Material (VENM). The contamination and salinity assessment prepared and the Construction Soil and Water Management Plan provides detail on current contamination issues.

5.2 ECRL Conversion Works

Detailed investigations of the subsurface conditions where the bulk of the excavation works will occur has yet to be completed. The worst case scenario is that up to 1500m^3 of fill material would require removal. This is based on the assumption that the all subgrade material below the existing track where trackworks are required would require removal if found to be unsuitable; and material where the chiller units are being proposed. Once detailed design and investigations progress, this number will be revised and updated if required.

5.3 Phase 2 Works

The current spoil volumes and movements have been calculated as per Table 4 - Spoil Volumes below. The majority of the spoil is expected to be able to be reused either on site of offsite.

Table 4 Spoil Volumes

Station	Cut	Fill	Surplus	Start	Finish
Total	**255,748**	**252,566**	**3,182**		
RTRF	0	0	0		
Bulk		0	0		
Cudgegong	0	52,071	-52,071		
Bulk (RTRF reprocess)		46,071	-46,071	Oct-16	Jun-17
Bulk		6,000	-6,000	Sep-16	Oct-16
Rouse Hill	20,735	6,770	13,965		
Bulk	10,079	6,770	3,309	Feb-17	Mar-17
Boxing	9,431		9,431	Dec-16	Oct-17
Drainage	1,225		1,225	Jan-17	Nov-17
Kellyville	70,401	7,035	63,366		
Bulk	11,700	2,400	9,300	Nov-16	Dec-16
Bulk	35,480	4,635	30,845	Apr-17	Sep-17

Boxing	15,890		15,890	Nov-16	Nov-17
Drainage	7,331		7,331	Dec-16	Dec-17
Bella Vista	36,870	99,360	-62,490		
Bulk	0	35,103	-35,103	Apr-17	Jul-17
Bulk	865	41,191	-40,326	Sep-17	Jan-18
Boxing	31,005	23,066	7,939	Apr-17	Apr-18
Drainage	5,000		5,000	May-17	May-18
Norwest	17,237	3,300	13,937		
Bulk	14,000	3,000	11,000	Nov-16	Jan-17
Bulk	1,742	300	1,442	Jan-17	Jan-17
Boxing	838		838	Dec-16	Oct-17
Drainage	657		657	Jan-17	Nov-17
Showground	35,961	14,950	21,011		
Bulk	5,260		5,260	Mar-17	Mar-17
Boxing	25,095	14,950	10,145	May-17	Apr-18
Drainage	5,606		5,606	Jun-17	May-18
Castle Hill	8,524	6,000	2,524		
Bulk	4,163	3,420	743	Mar-18	Apr-18
Boxing	3,137	2,580	557	Dec-16	Oct-17
Drainage	1,224		1,224	Jan-17	Nov-17
Cherrybrook	62,320	17,600	44,720		
Bulk	22,864	7,959	14,905	Sep-16	Feb-17
Bulk	10,000		10,000	Mar-17	Jul-17
Boxing	24,456	9,641	14,815	Sep-16	Apr-18
Drainage	5,000		5,000	Oct-16	May-18
Corridor	0	35,000	-35,000		
Bulk		35,000	-35,000		
Cheltenham	3,700	3,430	270		
Bulk	3,700	3,430	270		
Epping	0	7,050	-7,050		
Bulk	0	7,050	-7,050		

5.4 Norwest Pedestrian Link Works

Quantities have been included as part of Phase 2 works calculations.

5.5 33kV Underground Feeder Powerline Works and Rouse Hill Temporary Bypass Powerline Works

Approximate spoil volumes have not been calculated for these works. Each new section of trench will be backfilled with thermally stabilised backfill. Where unsuitable for backfill, the excavated material would be transported and either recycled or disposed of at an off-site waste disposal facility as required.

6 Spoil Reuse Opportunities

6.1 Reuse Hierarchy

The spoil reuse hierarchy adopted for the OTS works is consistent with the preferred hierarchy identified in EIS 1 of the NWRL Project. The target for spoil recycling or reuse for the project is 90%.

The hierarchy is listed below:

1. Reuse within the Project
   - reuse as construction material as fill or for landscaping and urban design
   - reuse for restoration of contaminated sites
2. Environmental works (off site)
   - reuse for restoration works on identified environmental initiatives
3. Reuse on other development projects
   - reuse as construction material on projects within a viable distance of the site
4. Offsite land restoration
   - reuse to fill disused facilities, e.g. mines and quarries, to enable either future development or ecological rehabilitation
5. Landfill management
   - reuse to cap completed landfill cells.

6.2 Identification of Possible Reuse Opportunities

This section documents the detailed assessment and evaluation NRT has undertaken for spoil reuse opportunities for the OTS Works. An overview of the assessment methodology utilised is provided below:

- Consideration of likely spoil characteristics
- Identification of possible reuse sites – this has built on the possible reuse sites identified in EIS 1 and EIS 2
- Screening of possible reuse opportunities – this assessment considered the following criteria:
  - spoil management hierarchy
  - distance from the work sites for off-site reuse options
  - land use, planning approval status and relevant licence conditions
  - availability of sites to accept spoil from the OTS Works
  - practicality of the method of reuse
  - cost.
- Excavated material suitable for re-use within the premises may be transported from one part of the premises or the Sydney Trains rail corridor or Sydney Trains

recycling facility to another part of the premises by road in accordance with Condition O5.4 of the EPL.

6.2.1 Reducing Spoil During Design Development General Principles

The design review process has been used to:

- Minimise the quantity of material requiring excavation to accommodate the design footprints
- Identify the location of spoil suitable for reuse on site
- Identify opportunities to maximise reuse of site-won spoil
- Maximise the quantity of spoil available for reuse on site
- Identify areas of contamination that may be avoided or require additional management measures
- Identify opportunities and locations for reuse of spoil off site.

The current calculations show a small surplus of material across the RTRF and Cudgegong Precinct, so the above measures will reduce the requirement for costly importation of materials. Material will only be removed from site if it is contaminated above the site criteria limits and cannot be reused on site or otherwise deemed to be unsuitable for any on-site re-use.

7 Spoil Handling

All spoil movements will be managed through the Material Movement Approval Form on ORIS. This form will cover:

- Importing spoil to site (such as VENM, ENM, Roadbase etc)
- Exporting material off the project site (to landfill, other developments etc)
- Moving material between NRT project sites

7.1 Onsite Spoil Handling

7.1.1 Phase 1 Works

Based on the current table of quantities and the planned sequencing of works, the plan for spoil management for Phase 1 is currently as follows:

- Stripped topsoil from the RTRF and Cudgegong Precinct will be temporarily stockpiled on the south side of the RTRF site
- Initial spoil excavated from the Cudgegong precinct will be cut to fill to the RTRF site
- Spoil excavated on the RTRF site will be cut to fill on the RTRF site to build the site up
- Excess spoil from the RTRF site will be used to fill around the future parking area in the Cudgegong Precinct

7.1.2 ECRL Conversion Works

The following will apply for material excavated from ECRL works:

- Excavated material that is not suitable for reuse (either geotechnically or chemically) would be loaded into a train or truck and transported to the Sydney Trains Chullora Recycling Facility
- If the material does not meet the requirement for recycling, the material would be loaded directly into trucks and disposed of at landfill
- Option for reuse on other parts of the NWRL would be investigated where the materials meets the relevant site criteria

7.1.3 Phase 2 Works

The following will apply for material excavated from Phase 2 works:

- Surplus from Rouse Hill and Kellyville would be reused in the corridor
- Surplus Cherrybrook would be reused at Cudgegong Road
- Surplus from Norwest, Showground, Castle Hill, Cheltenham and any excess from Cherrybrook would be taken to Epping and Bella Vista

7.1.4 Norwest Pedestrian Link Works

As per above for Phase 2.

7.1.5 33kV Underground Feeder Powerline Works and Rouse Hill Temporary Bypass Powerline Works

It is expected that the majority of the fill material would be suitable for reuse back in the trenches. Where there is excess fill material, or if it appears to be contaminated or geotechnically unsuitable it would be appropriately classified for offsite reuse or disposal.

7.2 Storage and Stockpiling

NRT would make its own arrangements for temporary or permanent stockpiles of materials arising from the Delivery Activities.

Different types of spoil will be segregated as far as practicable and stored separately to prevent mixing and cross-contamination.

All stockpiles will be managed in accordance with the requirements of the ‘Blue Book’ to prevent erosion and minimise the potential for pollution. Water based organic polymers will be used for short term control of risks associated with erosion and pollution.

Stockpiles would be located away from sensitive receivers, where feasible and reasonable, and protected from the elements through barriers, covering or establishing a cover crop.

Spoil that is to be stockpiled for an extended period will be managed to prevent erosion and minimise the potential for pollution. Typically water based polymers or vegetative stabilisation will be used. Stockpiles must not be placed in drainage lines, channels or paths.

Stockpiling locations for each worksite will be selected and developed in accordance with the Construction Compound and Ancillary Facilities Management Plan, Site Environment Plans (SEPs) and the ESCPs. Stockpiles located on land outside the Construction Site are subject to the land owner's and occupier's written consent, compliance with the law, consent of relevant Authorities and compliance with the Project Approval.

Materials which are not suitable for incorporation in the OTS Works would be removed from the Construction Site and disposed of at a construction waste recycling facility, or alternatively re-used, to the maximum extent possible

Where practical, contaminated material will be removed directly to a licensed facility. Where contaminated material is stored on site, stockpiles will be segregated and isolated in accordance with relevant health, safety and environmental regulations, codes and guidelines.

Spoil that is classified as special waste (containing asbestos) will be stockpiled on site in accordance with the relevant regulations and codes of practice prior to disposal to a licensed facility by a licensed contractor.

7.3 Spoil Testing and Classification

7.3.1 Reuse

Spoil would be reused on site in accordance with the National Environment Protection Council (NEPC) - National Environment Protection (Assessment of Site Contamination) Amended Measure No.1 2013 (NEPAM, 2013). These investigation levels are derived from toxicity of substances and estimated exposure of humans to the soil under various land use scenarios

7.3.2 Off Site Disposal

Where spoil is proposed to be taken off site, classification of spoil will be undertaken in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, November 2014). Sampling and analysis of spoil will be undertaken in accordance with the guidelines, and any applicable general exemption under the Protection of the Environment Operations (Waste) Regulation 2005. The type of spoil will be classified as follows:

- Virgin Excavated Natural Material (VENM) – VENM may require additional analysis to determine specific characteristics prior to acceptance for use at some sites. Specific analysis parameters will be determined in consultation with the intended receiver prior to removal from site
- Excavated natural material (ENM) – Material that does not meet the definition of VENM will be assessed in accordance with the General Exemption 'Excavated natural material exemption 2012'
- Waste material as defined in clause 49 of Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act):
  - Special waste
  - Liquid waste
  - Hazardous waste
  - Restricted solid waste
  - General solid waste (putrescible)
  - General solid waste (non-putrescible).

Waste dockets will be retained and recorded on the waste tracking register.

Spoil sampling and analysis will be undertaken in accordance with the Spoil Classification and Reuse Procedure.

Contaminated spoil will be managed in accordance with the Phase 2 Contamination Assessment and the Construction Soil and Water Management Plan.

NRT will ensure all spoil and fill are suitable for their proposed end use, based on the relevant EPA guidelines and exemptions.

7.4 Spoil Importation

Any spoil imported would be tested to ensure it meets the site criteria and classifications below in accordance with the EPL

- VENM
- Recycled materials from the Sydney Trains rail corridor or the Sydney Trains recycling facility or materials that meet the EPA's Resource Recovery Exemptions.

This will be verified by the Environment Manager or delegate prior to the importation of material.

8 Spoil Haulage

8.1 Haulage Routes

Haulage routes associated with the movement of spoil are described in the Construction Traffic Management Plan.

The key principle for spoil haulage by road is to select the most appropriate route which will minimise impact and facilitate efficient access to arterial roads. The following conditions apply to haulage:

- The body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to minimise any spill or escape of any dust, waste, or spoil from the vehicle or trailer
- Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the premises, is removed to the greatest extent practicable before the vehicle, trailer or motorised plant leaves the premises
- Road surfaces subject to the tracking of material by vehicles leaving the premises are effectively cleaned at the end of each work day.

8.2 Environmental and Social Impacts of Spoil Transfer and Reuse

Environmental and social issues associated with the management of spoil are defined in Section 4 of this Plan.

The processes and procedures implemented to manage potential environmental and social impacts associated with the transfer of spoil and the reuse of spoil are described in this Plan and in the aspect-specific sub plans to the CEMP including the:

- Construction Traffic Management Plan
- Construction Soil and Water Management Plan
- Construction Waste Management Plan.

Additional mitigation measures addressing the potential social impacts of spoil management, in particular requirements for consultation and notification are defined in the Community Liaison Implementation Plan.

9 Training, Reporting and Review

9.1 Training

Personnel will receive training appropriate to their role in spoil management on the project. Ongoing toolbox talks covering the requirements for management of spoil will be used to raise awareness to the wider project team.

Responsibility for management of spoil will rest with the Construction Team, supported by the Environment and Sustainability Team.

Personnel within the Construction Team will be responsible for the day to day management of environmental and social aspects associated with spoil excavation, reuse and transfer, including:

- Identifying opportunities to minimise spoil quantities and maximise reuse
- Identifying contamination and implementing appropriate management processes and procedures
- Tracking of spoil quantities and spoil transfer
- Managing traffic impacts associated with spoil transfer
- Implementing environmental controls required to mitigate impacts associated with spoil excavation and transfer.

NRT personnel and contractors responsible for management of spoil will provide evidence of appropriate qualifications or certifications prior to conducting works on site. The site induction will be utilised to train all staff in the general requirements of spoil management.

Specific training relating to aspects associated with the management of spoil will be provided to NRT staff as identified in the CEMP and training plan, or as otherwise deemed necessary to address an event or to manage risk.

9.2 Monitoring, Compliance and Reporting

Spoil management measures will be included in regular inspections by the NRT. Compliance records will be retained and will include:

- Records of inspections in relation to spoil management
- Records detailing the beneficial re-use of spoil either within the project or at off-site locations.
- Waste dockets for any spoil disposed of to landfill sites.
- Results and outcomes of inspections, monitoring and auditing will be reported internally on a monthly basis.
- Six-monthly construction compliance reports will be prepared to report on compliance with the Project Approval.

9.3 Review and Improvement

A non-conformance is an action or omission that does not conform to the requirements of this Plan or any legal and other requirements. Any member of the project team or the Environmental Representative can identify a non-conformance or opportunity for improvement. The CEMP identifies the process for identifying, reporting, recoding and reviewing non-conformances. This will ensure continual improvement.

The processes described in the CEMP may result in the need to update or revise this Plan. This will occur as needed. This Plan will be audited within six months of the commencement of construction and thereafter as per the CEMP. The Plan shall be reviewed and updated based on the findings of the audit

Annexure A Spoil Management Measures and Compliance Matrix

ID	Measure	Timing	Requirement	Responsibility	Reference
Project Approval – Specific Management Plan Requirements					
1.	Prior to the commencement of construction, or as otherwise agreed by the Director General, the Proponent shall prepare and implement (following approval) a Construction Environmental Management Plan for the SSI. The Plan shall outline the environmental management practices and procedures that are to be followed during construction, and shall be prepared in consultation with the relevant government agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004). The Plan shall include, but not necessarily be limited to: (e) details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be taken to address identified potential adverse environmental impacts (including any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the Plan: (vi) spoil management;	Before Construction	RTRF Approval SSI-5931 CoA E28(e)vi	Environment Manager	This Plan
EIS Environmental Management Measures					
2.	Spoil management would be undertaken in accordance with the spoil reuse hierarchy	During Construction	RTRF EIS EMM GHG1 EIS 2 REMM GHG1	Project Engineer	Section 6.1
3.	Excavated material and spoil would be beneficially reused on the NWRL project site or other sites, where feasible and reasonable, in accordance with the NWRL spoil use hierarchy	During Construction	RTRF EIS EMM W3 EIS 2 REMM W3	Project Engineer	Section 6.1
4.	Appropriate storage, treatment and disposal procedures would be implemented for any contaminated soil.	During Construction	RTRF EIS EMM W4 EIS 2 REMM W4	Environment Coordinator Project Engineer	Section 7.3

ID	Measure	Timing	Requirement	Responsibility	Reference
5.	Stockpiles would be located away from sensitive receivers, where feasible and reasonable, and protected from the elements through barriers, covering or establishing a cover crop	During Construction	RTRF EIS EMM A11 EIS 2 REMM A11	Environment Coordinator Project Engineer	Section 7.2
Northwest Rail Link Construction Environmental Management Framework					
6.	Spoil Management Objectives The following spoil management objectives will apply to the construction of the project: • The beneficial reuse of spoil from the project will target 100 per cent reuse or recycling (on or off-site) of usable spoil. • Spoil will be managed with high consideration to minimising adverse traffic and transport related issues. • Potential contamination of land or water from contaminated spoil will be avoided. • Spoil will be managed with consideration of the impacts on residents and other sensitive receivers. • Site contamination will be effectively managed to limit the potential risk to human health and the environment.	During Construction	NWRL CEMP Framework Section 6.1	Environment Coordinator Project Engineer	Section 1.3
7.	Spoil Management Implementation NWRL Principal Contractors will develop and implement a Spoil Management Plan for their scope of works. The Spoil Management Plan will include as a minimum: • The spoil mitigation measures as detailed in the environmental approval documentation. • The responsibilities of key project personnel with respect to the implementation of the plan. • Spoil management monitoring requirements.	During Construction	NWRL CEMP Framework Section 6.2	Environment Coordinator Project Engineer	This Plan This Table Section 3 Section 9.2 Section 9.2

ID	Measure	Timing	Requirement	Responsibility	Reference
	• Compliance record generation and management.				
8.	Spoil management measures will be included in regular inspections undertaken by the Contractor, and compliance records will be retained. These will include: • Records of inspections in relation to spoil management. • Records detailing the beneficial re-use of spoil either within the project or at off-site locations. • Waste dockets for any spoil disposed of to landfill sites	During Construction	NWRL CEMP Framework Section 6.2	Environment Coordinator Project Engineer	Section 9.2
9.	Spoil Mitigation Examples of spoil mitigation measures include: • Implementing the spoil re-use hierarchy. • Handling spoil to minimise potential for air or water pollution. • Minimise traffic impacts associated with spoil removal.	During Construction	NWRL CEMP Framework Section 6.3	Environment Coordinator Project Engineer	Section 6.1 Section 8
10.	Stockpiling of materials for construction (a) OpCo must make its own arrangements for temporary or permanent stockpiles of materials arising from the delivery activities (b) Materials which are not suitable for incorporation in the OTS Works must be removed from the Construction Site and disposed of at a construction waste recycling facility, or alternatively re-used, to the maximum extent possible. (c) Stockpiles located on land outside the Construction Site are subject to the land owner's and occupier's written consent, compliance with the law, consent of relevant Authorities and compliance with the Environmental Documents. (d) Stockpiles must not be placed in drainage lines, channels or paths.	During Construction	Project Deed Exhibit 1, SPR, 6.5.7	Environment Coordinator Project Engineer	Section 7.2
11.	In addition to the plans required by the Environmental Documents, the Construction Environmental Management Plan must also include, as separate sub-plans:	During Construction	Project Deed App 54 – Section 3.17 (k)i	Environment Manager	This Plan

ID	Measure	Timing	Requirement	Responsibility	Reference
	Spoil Management Plan;				
12.	The Spoil Management Plan must address and detail the: • excavation, handling, haulage and disposal methodology, including on-site storage and stockpiling arrangements; • processes and procedures that will be used for the management of spoil, including those for virgin excavated natural material, contaminated and unsuitable material; • measures that will be implemented to both reduce spoil quantities and maximise the beneficial reuse of spoil which will be generated during the performance of OpCo's Activities; • quantities for reuse of spoil within the Construction Site, for beneficial reuse of spoil off site and for spoil disposal; and • processes and procedures for the management of the environmental and social impacts of spoil transfer and reuse.	During Construction	Project Deed App 54 – Section 3.17 (l)	Environment Manager	Section 7 Section 7.3 Section 6 Section 5 Section 8.2
EPL Conditions					
13.	Waste management The licensee must assess, classify and manage any waste generated at the premises in accordance with the Waste Classification Guidelines Part 1 : Classifying Waste, April 2008 (Waste Guidelines) prior to dispatching the waste offsite.	During Construction	O5.1	Environment Manager	Section 7.3.2
14.	Excavated material suitable for re-use within the premises may be transported from one part of the premises or the Sydney Trains rail corridor or Sydney Trains recycling facility to another part of the premises by road in accordance with Condition O5.4.	During Construction	O5.3	Environment Manager	Section 6.2 Section 7.4
15.	The licensee must ensure that: (a) the body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to minimise any spill	During Construction	O5.4	Environment Manager	Section 8.1

ID	Measure	Timing	Requirement	Responsibility	Reference
	or escape of any dust, waste, or spoil from the vehicle or trailer; and (b) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the premises, is removed to the greatest extent practicable before the vehicle, trailer or motorised plant leaves the premises; and (c) road surfaces subject to the tracking of material by vehicles leaving the premises are effectively cleaned at the end of each work day.				
ECRL Determination Report Conditions of Approval					
16.	appropriate measures to address the beneficial reuse of spoil, including spoil management targets and reporting	During Construction	34(iii)	Environment Manager	Section 6 Section 9.2

Annexure B Glossary

Term/Acronym	Definition
ANZECC	Australian and New Zealand Environment Conservation Council
CEMF	Construction Environmental Management Framework (Appendix C of Submissions Report)
CEMP	Construction Environmental Management Plan.
CoA	Condition of Approval
DECC	Department of Environment and Climate Change (now EPA)
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EIS 1	EIS for Stage 1: Major Civil Construction Works (Incorporating Staged Infrastructure Modification Assessment)
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
NHMRC	National Health and Medical Research Council
NRT	Northwest Rapid Transit
NWRL	North West Rail Link (*now renamed as* 'Sydney Metro Northwest')
OTS	Operations, Trains and Systems
POEO Act	*Protection of the Environment Operations Act 1997*
Project	The North West Rail Link Project
Project Planning Approval	Minister for Planning and Infrastructure's Approval for North West Rail Link Stage 1: Major Civil Works dated 25 September 2012
REMM	Revised Environmental Mitigation Measures (Section 7 of the Submissions Report)
RFT	Request for Tender
SEP	Site Environment Plan
Spoil	All material generated by excavation into the ground including the excavation of station boxes and tunnels
SSI	State Significant Infrastructure
SWTC	Scope of Works and Technical Criteria

Term/Acronym	Definition
TBM	Tunnel Boring Machine
TfNSW	Transport for New South Wales
TSC Works	Tunnels and Station Civil Works for the North West Rail Link Project
VENM	Virgin Excavated Natural Material is natural material (such as clay, gravel, sand, soil and rock) that: (a) is not mixed with any other type of waste; and (b) has been excavated from areas of land that are not contaminated.