24 Spoil, waste management and resource use – Stage 1

24 Spoil, waste management and resource use – Stage 1

This chapter provides an assessment of spoil and waste generation and resource use during Stage 1 and includes a description of how spoil, waste and resources would be managed.

24.1 Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements relating to spoil, waste management and resource use, and where these requirements are addressed in this Environmental Impact Statement, are outlined in Table 24-1.

Table 24-1: Secretary's Environmental Assessment Requirements – Spoil, waste management and resource use Stage 1

Reference	Requirement	Where addressed
2. Spoil		
2.1	Relevant commitments made in Section 9.17.2 of the Scoping Report	Sections 24.5.1 to 24.5.4 Refer to Table 2 of Appendix A for Scoping Report requirements
2.2	Spoil generation and reuse, including: a. type and quantity;	Section 24.5.1
	b. onsite storage (including capacity to minimise amenity impacts);	
	c. reuse potential and disposal sites;	
	d. transport and handling options (including traffic, distance, road safety and related amenity and environmental impacts); and	
	e. illegal dumping.	
13. Other Issues		
13.1	Air quality, greenhouse gas and energy, climate change adaptation, waste management and resource use, hazard and risk assessments should be undertaken in accordance with the commitments in Section 9 of the Scoping Report.	Chapter 23 Chapter 24 Chapter 25 Chapter 26 Section 24.5.3 Section 24.5.2

24.2 Legislative and policy context

The legislative and policy context for spoil, waste management and resource use is described in Chapter 8 (Concept environmental assessment).

The following additional guidelines inform or respond to the regulatory framework and have been applied to the assessment of Stage 1:

- Waste Classification Guidelines (NSW Environment Protection Authority, 2014)
- NSW Sustainable Design Guidelines, Version 4.0 (Transport for NSW, 2019)
- Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004).

Sydney Metro's commitment to managing waste during construction of Stage 1 is outlined in Section 24.4 and in Chapter 26 (Sustainability and climate change – Stage 1).

24.3 Assessment approach

A desktop assessment was carried out and comprised:

- Review of spoil generation (quantity and type) and reuse opportunities
- Review of the likely resources required for construction of Stage 1, including construction materials, water and power
- Identification of likely waste generating activities
- Review of the likely waste types
- Identification of possible waste streams in accordance with relevant legislation and guidelines
- Identification of the environmental impacts associated with the generation of waste materials and subsequent disposal, with consideration of:
  - Waste minimisation and reuse potential
  - The capacity of disposal facilities to receive the volumes of waste for key waste streams generated by Stage 1
- Development of a spoil management strategy to identify how spoil would be managed during construction, including likely spoil volumes, likely nature and classification of excavated material, opportunities for recycling, potential disposal sites, stockpile management, and method(s) and route of transportation
- Development of management strategies to adequately address waste during construction, including:
  - Managing construction waste through the waste hierarchy established under the *Waste Avoidance and Resource Recovery Act 2001*
  - Procedures for the assessment, handling, stockpiling and disposal of potentially contaminated materials and wastewater, in accordance with the NSW Environment Protection Authority publication Waste Classification Guidelines (NSW Environment Protection Authority, 2014)
  - Targets for the beneficial reuse of solid wastes, wastewater and other construction wastes in accordance with the Sydney Metro West sustainability plan. Refer to Chapter 26 (Sustainability and climate change – Stage 1)
- Consideration of the cumulative effects of spoil haulage, waste management and resource use with other major infrastructure projects within Sydney.

24.4 Avoidance and minimisation of impacts

The design development process for Stage 1 aimed to avoid or minimise potential spoil and waste management and resource use impacts. This included the selection of tunnelling equipment (tunnel boring machines) to excavate the mainline tunnels which would minimise spoil generation by cutting a circular profile ideal for a rail tunnel.

24.5 Potential impacts

24.5.1 Spoil generation and management

Spoil generation

As discussed in Chapter 9 (Stage 1 description), spoil from tunnel boring would be extracted from the Westmead metro station construction site and The Bays Station construction site (as reflected in Table 24-2), while spoil from other construction sites would generally be excavated from station sites and shafts.

Stage 1 would generate about 3.05 million cubic metres of in-situ spoil. Indicative volumes of spoil generated at each construction site during Stage 1 are outlined in Table 24-2.

Table 24-2: Indicative volumes of spoil generated during construction of Stage 1

Construction site	Volume of spoil (m^3)	Expected spoil composition
Westmead metro station (and crossover cavern)	245,000 675,000 (from tunnelling)	Fill Residual clay Ashfield Shale Mittagong formation
Parramatta metro station	125,000	Parramatta Sands Ashfield Shale Mittagong Formation Hawkesbury Sandstone
Clyde stabling and maintenance facility	20,000 (services facility shaft) 90,000 (dive structure) 85,000 (connecting tunnels)	Fill Residual clay Ashfield Shale Mittagong formation Hawkesbury Sandstone
Silverwater services facility	20,000	Fill Residual clay Ashfield Shale Mittagong formation Hawkesbury Sandstone
Sydney Olympic Park metro station	225,000	Fill Ashfield Shale
North Strathfield metro station	110,000	Fill Residual clay Ashfield Shale Mittagong formation Hawkesbury Sandstone
Burwood North Station	235,000	Fill Ashfield Shale Mittagong formation Hawkesbury Sandstone
Five Dock Station	165,000	Fill Residual clay Ashfield Shale Mittagong formation Hawkesbury Sandstone
Services facility between Five Dock and The Bays	35,000	Hawkesbury Sandstone
The Bays Station	155,000 860,000 (from tunnelling)	Alluvial/marine deposits Fill Residual clay Hawkesbury Sandstone
Total	**3,045,000**	

The largest volumes of spoil are anticipated to be generated during the excavation of the tunnels and stations, with smaller quantities of spoil generated from services facilities. Excavated material would predominantly include uncontaminated soil, crushed rock and wastewater (from water used during excavation, and groundwater inflows).

Spoil stockpiles

Spoil from tunnelling works of the mainline tunnels would be transported from the tunnel face to stockpiles within the Westmead metro station and The Bays Station construction site. Spoil generated by other earthworks, such as station and services facility excavation, would also be stored in stockpiles at each construction site. These stockpiles would be bunded and managed to avoid potential impacts associated with runoff, sedimentation and leachate. Stockpiling of spoil at construction sites would be managed to balance impacts associated with truck movements and impacts associated with dust, runoff and sedimentation.

Potential dust impacts would be further minimised through the implementation of the environmental mitigation measures described in Chapter 23 (Air quality – Stage 1). Potential impacts from runoff and sedimentation would be further minimised through the implementation of the environmental mitigation measures described in Chapter 19 (Soils and surface water quality – Stage 1).

Spoil management

The design of Stage 1 tunnels and station excavations and the preferred construction methodology has taken into consideration the waste hierarchy by aiming to reduce the volume spoil generated, as far as practical. Opportunities to further reduce the generation of spoil through tunnel and station optimisation would be considered during future design.

Spoil would be classified in accordance with Waste Classification Guidelines (NSW Environment Protection Authority, 2014). Spoil that is classified as virgin excavated natural material, or excavated natural material, subject to a resource recovery order/resource recovery exemption under the Protection of the Environment Operations (Waste) Regulation 2014 or is otherwise reusable would be reused following a set of criteria for reuse, recycling and disposal of material as provided in Table 24-3. Following the criteria, a hierarchy of management options for spoil reuse is presented in Table 24-4.

Table 24-3: Reuse, recycling and disposal criteria

Option	Criteria
Reuse on Sydney Metro West sites	• The material is suitable for the final land use at the placement location in accordance with guidelines made or approved under the *Contaminated Land Management Act 1997* and would not cause pollution under the *Protection of the Environment Operations Act 1997* • The material meets engineering requirements for the placement location.
Reuse off-site	• The material meets Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM) definition • Suitable off-site reuse locations have been identified and have necessary approvals to receive the material.
	• The material does not meet VENM or ENM definition but has potential for reuse and a Resource Recovery Exemption/Resource Recovery Order has been granted • Suitable off-site reuse locations have been identified and have necessary approvals to receive the material.
Recycling off-site	• The material has value for recycling • Suitable off-site reuse locations have been identified and have necessary approvals to receive the material.
Disposal off-site	• The material is classified as General Solid Waste, Restricted Solid Waste, Special Waste or Hazardous Waste • Suitable off-site reuse locations have been identified and have necessary approvals to receive the material.

Table 24-4: Spoil management hierarchy for Stage 1

Priority	Reuse options	Possible reuse options
1	Within the Stage 1 footprint	• Reuse spoil for landscaping, structural fill, general fill, fill embankments and mounds within a short haulage distance of the source • Reuse spoil to restore any pre-existing contaminated sites within the Stage 1 construction footprint • Reuse spoil as a feed product in construction materials.
2	Environmental projects (outside of the Stage 1 footprint)	• Reuse spoil for coastal protection, such as beach nourishment and land raising • Reuse spoil in flood mitigation projects.
3	Other development projects (including other Sydney Metro projects)	• Reuse spoil for landscaping, structural fill, general fill, fill embankments and mounds on projects within a financially feasible transport distance of the site • Reuse spoil for land reclamation or remediation projects • Reuse sand for manufacturing concrete and shale for manufacturing bricks and tiles.
4	Land restoration	• Reuse spoil to fill disused facilities (for example mines and quarries) to enable either future development or site rehabilitation.
5	Landfill management	• Reuse spoil to cap completed landfill cells • Reuse spoil in daily covering of landfill waste.

Spoil reuse opportunities for Stage 1 and other projects

Sydney Metro would target beneficial reuse of 100 per cent of the usable spoil generated during construction. The geology of the spoil material as well as its consistency and quality would determine the reuse options. It is envisaged the spoil produced by Stage 1 would have the characteristics and potential reuse opportunities suitable for priority 1, 2 and 3 spoil management options outlined in Table 24-5.

Table 24-5: Spoil characteristics and potential reuse opportunities for Stage 1

Spoil characteristic	Potential reuse opportunities for priority 1, 2 and/or 3 spoil management options
Clean granular fill	Structural fill
Excavated moist clay and clayey sand material	General fill (following moisture conditioning)
Excavated weathered shale and sandstone	Structural fill (following moisture conditioning to reduce reactivity for shale)
Medium strength or better-quality shale	Non-reactive fill
Medium to high strength sandstone	Structural fill
Wet clay and wet shale spoil	Unlikely to be suitable for reuse without substantial moisture conditioning
Contaminated soils	General fill for priority 1 (in accordance with guidelines made or approved under the *Contaminated Land Management Act* and would not cause pollution under the *Protection of the Environment Operations Act 1997*) General fill for priority 2 (subject to a resource recovery order and/or exemption under the Protection of the Environment Operations (Waste) Regulation 2014)

The Stage 1 civil works for the Clyde stabling and maintenance facility would present a key opportunity for spoil reuse. About one million cubic metres of fill would be required to protect the facility from flooding impacts – refer to Chapter 9 (Stage 1 description) and Chapter 21 (Hydrology and flooding – Stage 1). The suitability of the spoil generated by Stage 1 for this use would be assessed during construction.

It is expected there may be limited opportunities for additional spoil reuse at other Stage 1 construction sites. The quantities and locations of any additional reuse opportunities would be determined during further design of Stage 1. The reuse of spoil for Stage 1 construction works would be maximised to the extent possible before alternative off-site opportunities for spoil reuse are pursued.

Where spoil cannot be reused for Stage 1, opportunities to reuse this material in future stages or on other projects (preferably within the Sydney region to reduce transport distances) would be identified. Potential options for spoil reuse/disposal sites are included in Table 24-6.

Table 24-6: Potential spoil reuse/disposal opportunities

Potential re-use location	Haulage distance from Stage 1 construction footprint
Moorebank Intermodal Terminal and Freight Precinct	16 kilometres
Western Sydney Airport	25 kilometres
Port Kembla Outer Harbour land reclamation works	70 kilometres
Development and infrastructure projects in the Sydney metropolitan region	Various
Brick making businesses in the Sydney metropolitan region	Various

These sites have a need for spoil or fill material and represent viable reuse locations. Other reuse or disposal sites may be used depending on need at the time the spoil is generated.

Spoil reuse opportunities for land restoration and landfill management

Spoil could be used for filling former quarries in the Sydney region and beyond. Former quarries and other sites that are potentially available for large-scale reuse of virgin excavated natural material, excavated natural material and material subject to resource recovery orders/exemptions are listed in Table 24-3. Spoil could also be used to cap completed landfill cells and to cover waste at active landfill sites. Potential opportunities for spoil reuse in land restoration and landfill management applications would be determined during further construction planning for Stage 1.

Table 24-7: Possible large-scale spoil reuse opportunities in the Sydney region and beyond

Potential reuse location	Haulage distance from Stage 1 construction footprint
Kurnell Landfill	20 kilometres
Castlereagh Landfill	30 kilometres
Penrith Lakes Scheme	30 kilometres
Bombo Quarry	120 kilometres

Contaminated soil

There is potential to encounter contaminated soil or rock during Stage 1 during spoil-generating construction works at all Stage 1 construction sites (refer to Chapter 20 (Contamination – Stage 1)).

Contamination is defined in the *Contaminated Land Management Act 1997* as the presence of a substance in, on or under the land at a concentration above which the substance is normally present and that presents a risk of harm to human health or any other aspect of the environment.

Sampling and testing of soils in areas of potential contamination concern would be conducted to characterise the soils and determine the appropriate waste classification (which may include hazardous wastes or special wastes). Characterisation would be carried out in accordance with guidelines made or approved under the *Contaminated Land Management Act 1997*. Waste classification would be carried out in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (NSW Environment Protection Authority, 2014).

The suitability for beneficial reuse of tested soils would also be determined in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (National Environment Protection Council, 1999) and the Environment Protection Authority NSW resource recovery framework. Soils would be considered for reuse within the spoil management hierarchy for Stage 1 (refer to Table 24-4) if they would not cause harm to human health or the environment. Reuse of these soils for projects and opportunities outside of the Stage 1 construction footprint would require a resource recovery order and/or exemption under the Protection of the Environment Operations (Waste) Regulation 2014.

Soils that cannot be beneficially reused would be disposed off-site and be managed and transported in accordance with the waste classification and the Protection of the Environment Operations (Waste) Regulation 2014 and disposed of to an appropriately licensed waste management facility. There are several solid waste landfills in Sydney that are licensed to accept contaminated soils. It is anticipated the volumes of contaminated spoil generated during Stage 1 could be readily accommodated at these facilities. Alternatively, materials may be transported to appropriately licenced facilities in NSW. If materials are required to be transported interstate, this would be carried out in consultation with the NSW Environment Protection Authority and relevant interstate regulatory bodies and in accordance with regulatory requirements. Further discussion of contamination, including asbestos and other hazardous materials, is provided in Chapter 20 (Contamination – Stage 1).

Acid sulfate soils

As discussed in Chapter 19 (Soils and surface water quality – Stage 1), there is potential to encounter acid sulfate soils during excavation and other ground disturbance at the following Stage 1 construction sites:

- Parramatta metro station
- Clyde stabling and maintenance facility
- The Bays Station.

Impacts associated with the disturbance of acid sulfate soils are described in Chapter 19 (Soils and surface water quality – Stage 1), as are measures to mitigate potential impacts. Acid sulfate soils would be disposed of in accordance with the Waste Classification Guidelines Part 4: Acid Sulfate Soils (Environment Protection Authority, 2014).

24.5.2 Resource use

A variety of resources would be needed to construct Stage 1. The resource requirements for Stage 1 shown in Table 24-5 are typical for an infrastructure project of this scale. While the resource requirements of Stage 1 have the potential to temporarily impact resource availability within the Sydney metropolitan region over the construction period, the recent concurrent construction of other major infrastructure projects including NorthConnex, WestConnex, Sydney Metro Northwest and Sydney Metro City & Southwest (Chatswood to Sydenham) from 2015 to the present demonstrates the market is able to manage the concurrent construction of major infrastructure projects given sufficient opportunity to forward plan. The period between the approval of Stage 1 and the start of major construction would be sufficient to allow the market to prepare for the resource needs of Stage 1 in conjunction with the concurrent infrastructure projects listed in Appendix G (Cumulative impacts assessment methodology – Stage 1).

Indicative quantities of the major resources to complete the construction of Stage 1 are provided in Table 24-8.

Table 24-8: Indicative quantities of resources required for construction

Material	Indicative quantity required
Electricity	140 gigawatt hours
Fuel	40,000 kilolitres
Concrete	870,000 tonnes
Shotcrete	12,000 tonnes
Steel	30,000 tonnes
Water	370 mega litres

The development of Stage 1 has included careful consideration of the construction methodology and selection of materials and resources to ensure fitness for purpose and minimise resource consumption. Consistent with the resource management hierarchy of the *Waste Avoidance and Resource Recovery Act 2001*, resource consumption would be further minimised during construction through reuse of materials, where possible.

24.5.3 Waste generation and management

Waste generation

The volumes of construction wastes are expected to be comparable to other similar infrastructure projects including Sydney Metro Northwest (which opened in May 2019) and the Chatswood to Sydenham component of Sydney Metro City & Southwest (currently under construction). These construction wastes would be manageable through the application of waste management strategies outlined in the following section.

The likely main construction waste streams for Stage 1 are outlined in Table 24-9 along with the likely waste classification under the Waste Classification Guidelines (NSW Environment Protection Authority, 2014). About 317,050 tonnes of demolition materials and about 2,850 megalitres of wastewater would be produced during Stage 1. The types and quantities of construction waste generated during Stage 1 would be site specific and would vary throughout the construction period. The quantities and classification of waste streams would be confirmed following further design work.

Table 24-9: Indicative types of waste generated during construction

Activity	Waste stream	Examples of wastes	Likely waste classification
Demolition of buildings and other structures	General demolition wastes	• Concrete • Bricks • Tile • Timber • Metals • Plasterboard • Carpets • Electrical and plumbing fittings • Furnishings	• General solid waste (non-putrescible)
	Hazardous wastes	• Heavy metals	• Hazardous waste
	Special waste	• Asbestos	• Special waste
Clearing and grubbing of vegetation, landscaped and/or turfed areas	Vegetation wastes	• Trees • Shrubs • Ground cover • Soil	• General solid waste (non-putrescible)
Tunnelling, excavation and general earthworks	Spoil	• Virgin excavated natural material (uncontaminated soil and crushed rock) • Acid sulfate soils • Soils and materials containing asbestos, heavy metals, hydrocarbons, pesticides and/or other industrial residues	• General solid waste (non-putrescible) • General solid waste (putrescible) • Special waste • Restricted solid waste • Hazardous waste
	Tunnel boring machine wastes	• Cutter heads • Associated equipment replacement (conveyor belts etc.)	• General solid waste (non-putrescible)
	Wastewater	• Groundwater inflows to tunnels and station excavations	• Liquid waste
Dust suppression, wash down of plant and equipment, and staff amenities at construction sites (such as toilets)	Wastewater	• Sediment-laden wastewater • Sewage • Grey water	• Liquid waste

Activity	Waste stream	Examples of wastes	Likely waste classification
General construction works and resource use	General construction wastes	• Timber formwork • Scrap metal • Steel • Concrete • Plasterboards • Soil • Packaging materials	• General solid waste (non-putrescible)
Maintenance of construction plant, vehicles and equipment	Mechanical wastes	• Adhesives • Lubricants • Waste fuels • Oils • Engine coolant • Batteries • Hoses • Tyres	• Hazardous waste and/or special waste • Liquid waste
Works at site offices and crib rooms	General wastes	• Putrescibles • Paper • Cardboard • Plastics • Glass • Printer cartridges	• General solid waste (non-putrescible) • General solid waste (putrescible)

Waste management

Based on the construction performance of Sydney Metro Northwest and Sydney Metro City & Southwest, Sydney Metro West would adopt a construction waste recycling target of 95 per cent.

Potential waste management issues are manageable through standard mitigation measures. These measures would be developed in accordance with the Sydney Metro Construction Environmental Management Framework which requires the Principal Contractor to develop a waste management plan (refer to Appendix D) and the Sydney Metro West sustainability plan (refer to Chapter 26 (Sustainability and climate change – Stage 1)) and would address the following:

- Classification of waste in accordance with the current guidelines
- Handling of waste including measures to facilitate segregation of waste into stockpiles of concrete, steel, timber, paper and cardboard and vegetation to make it easier to recycle components and prevent cross contamination
- Management of waste
- Waste minimisation and reuse
- Lawful disposal or recycling locations for each type of waste using a hierarchy which prioritises higher value end use
- Contingencies for the above, including managing unexpected waste volumes.

Potential waste management issues during construction would be temporary and include:

- Waste potentially being unnecessarily directed to landfill due to the inadequate collection and/or incorrect classification which would increase the demand for landfill capacity within the Sydney region
- Potential contamination of soil, surface and/or groundwater from the inappropriate storage, transport and disposal of liquid and solid wastes
- Potential increase in vermin from the incorrect storage, handling and disposal of putrescible waste from construction sites
- Potential incorrect classification and/or disposal of waste, including the incorrect storage, handling and disposal of hazardous materials (for example, asbestos from building demolition)
- Potentially excessive amounts of materials being ordered, resulting in a large amount of left-over, unused resources
- Lack of identification of feasible options for recycling or reuse of resources.

Existing metropolitan waste management facilities would have capacity to receive the anticipated waste streams generated by Stage 1. General construction and demolition wastes and wastes from site offices would be collected for off-site recycling wherever practicable. Wastes that contain hazardous, special or otherwise contaminated materials would be treated and disposed of off-site at a licensed facility in accordance with the relevant guidelines (refer to Section 24.2). Waste facilities in Sydney licensed to accept general solid waste and vegetation waste include (but are not limited to):

- Clyde Transfer Terminal
- Eastern Creek Resource Recovery Park
- Kemps Creek Advanced Resource Recovery Park
- Lucas Heights Resource Recovery Park.

A number of waste facilities in Sydney are licenced to accept special and/or hazardous waste, including:

- Chullora Resource Recovery Facility
- Elizabeth Drive Landfill, Kemps Creek
- Eastern Creek Resource Recovery Park
- Genesis Xero Waste – Landfill and Recycling
- Horsley Park Waste Management Facility
- Jacks Gully Waste and Recycling Centre
- Kimbriki Recycling and Waste Disposal Centre
- Lucas Heights Resource Recovery Park
- Wetherill Park Resource Recovery Facility.

Recyclables such as containers (plastics, glass, cans, etc), paper and cardboard would be collected by an authorised contractor for off-site recycling. There are a number of materials recovery facilities in Sydney. The recycling facility would be determined by the contractor engaged to collect the material.

Management strategies that would be developed to address specific construction wastes are discussed further below.

Spoil

The spoil management hierarchy and strategy are discussed in detail in Section 24.5.1.

Demolition wastes

As outlined in Chapter 9 (Stage 1 description), it is anticipated that construction of Stage 1 would require the demolition of about 114 buildings. Demolition waste would be managed through the waste hierarchy established under the *Waste Avoidance and Resource Recovery Act 2001* (refer to Section 24.2).

Demolition waste would be segregated and stockpiled on site, with materials such as bricks and tiles, timber, plastic and metals being separated where practicable. All demolition waste would be classified in accordance with the Waste Classification Guidelines (Environment Protection Authority, 2014) and sent to a waste facility with recycling capabilities, where appropriate, or directed to a waste management facility that is lawfully permitted to accept that type of waste.

Hazardous materials

There is the potential for materials to be present within demolished buildings/structures that meet the hazardous waste criteria within the Waste Classification Guidelines (NSW Environment Protection Authority, 2014). The presence of potentially hazardous wastes would be identified through a hazardous material survey which would be completed for those buildings and structures suspected of containing hazardous materials prior to their demolition – refer to Chapter 25 (Hazards – Stage 1). If materials that meet the hazardous waste criteria are encountered, they would be handled and managed in accordance with relevant legislation, codes of practice and Australian standards.

The management of contaminated spoil and acid sulfate soils, which may be classified as hazardous wastes, are discussed further in Section 24.5.1.

Special wastes

There is the potential for asbestos containing materials to be present within demolished buildings/structures. Under the Waste Classification Guidelines (NSW Environment Protection Authority, 2014), asbestos is defined as a 'special waste'. The disturbance, movement and disposal of asbestos containing materials would be carried out in strict accordance with the Protection of the Environment Operations (Waste) Regulation 2014, Work Health and Safety Regulation 2017 and applicable guidelines.

The management of contaminated spoil, which may be classified as special wastes, are discussed further in Section 24.5.1.

Wastewater

As discussed in Chapter 18 (Groundwater and ground movement – Stage 1), the excavation of the tunnels, stations and shafts are likely to intercept groundwater aquifers resulting in the need to capture, treat and discharge water. Construction water treatment plants would be required at the tunnelling support sites and each construction site which would treat all intercepted groundwater to meet the requirements of any environmental protection licence issued for Stage 1 and/or the relevant requirements of the *Protection of the Environment Operations Act 1997.* Treatment of construction water is discussed further in Chapter 19 (Soils and surface water quality – Stage 1).

The reuse of treated water would be maximised during the construction works by re-circulating water to the tunnel cutting face (where it is of suitable quality) and for surface dust suppression, however there would be a surplus of treated water requiring discharge from the sites. Considering the prevailing drought conditions in Sydney and across NSW, Sydney Metro is further investigating options to minimise potable water use and maximise wastewater reuse. Additionally, opportunities to treat wastewater to a higher standard to enable additional end uses onsite or offsite would be considered, to further reduce reliance on potable water supply. Once potential onsite water uses are exhausted, water would be discharged to the local stormwater system or directly to a local surface watercourse, although options such as disposal via Sydney Water trade waste agreements would be investigated during detailed construction planning. The water balance for Stage 1 is discussed further in Chapter 19 (Soils and surface water quality – Stage 1).

Wastewater would also be generated by the use of staff amenities at construction sites (such as toilets). Sewage and grey water from these amenities would be disposed to sewer or transported to an appropriately licenced liquid waste treatment facility.

24.5.4 Cumulative impacts

Potential cumulative impacts associated with spoil and waste management and resource use during Stage 1 would be limited to temporary increases in resource demand and availability, waste and spoil generation, and temporary impacts to reuse and disposal opportunities within the Sydney metropolitan region. Cumulative spoil and waste management and resource use impacts would be managed through the mitigation measures in Table 24-10 and in Chapter 27 (Synthesis of the Environmental Impact Statement).

24.6 Management and mitigation measures

24.6.1 Approach to management and mitigation

Spoil and waste would be managed in accordance with Sydney Metro's Construction Environmental Management Framework which is described in Chapter 27 (Synthesis of the Environmental Impact Statement). The Construction Environmental Management Framework includes requirements in relation to:

- Management of spoil
- Preparation of a Waste Management Plan
- Waste monitoring, reporting and compliance tracking.

24.6.2 Mitigation measures

Specific mitigation measures that would be implemented, to address potential impacts associated with spoil, waste management and resource use are listed in Table 24-10.

Table 24-10: Mitigation measures – Spoil, waste management and resource use Stage 1

Reference	Impact/issue	Mitigation measure	Applicable location(s)[1]
WR1	Compliance with legislative and policy requirements	All waste would be assessed, classified, managed, transported and disposed of in accordance with the Waste Classification Guidelines.	All
WR2	Disposal of hazardous materials	A hazardous material survey would be completed for those buildings and structures suspected of containing hazardous or special waste materials (particularly asbestos) prior to their demolition. If hazardous waste or special waste (e.g. asbestos) is encountered, it would be handled and managed in accordance with relevant legislation, codes of practice and Australian standards.	All
WR3	Waste minimisation	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging.	All
WR4	Reuse and recycling	Waste streams would be segregated to avoid cross-contamination of materials and maximise reuse and recycling opportunities.	All
WR5	Reuse on Sydney Metro West sites	A materials tracking system would be implemented for material transferred between Sydney Metro West sites and to offsite locations such as licensed waste management facilities.	All

Note 1: WMS: Westmead metro station; PMS: Parramatta metro station; CSMF: Clyde stabling and maintenance facility; SSF: Silverwater services facility; SOPMS: Sydney Olympic Park metro station; NSMS: North Strathfield metro station; BNS: Burwood North Station; FDS: Five Dock Station; TBS: The Bays Station; Metro rail tunnels: Metro rail tunnels not related to other sites (e.g. tunnel boring machine works); PSR: Power supply routes.

24.6.3 Interactions between mitigation measures

Mitigation measures in other chapters that are relevant to the management of waste include:

- Chapter 19 (Soils and surface water quality – Stage 1), specifically measures which address potential acid sulfate soils and the and potential interaction with contaminated soils
- Chapter 20 (Contamination – Stage 1), specifically measures which address the disturbance of contaminated land during construction
- Chapter 26 (Sustainability and climate change – Stage 1), specifically measures which address the implementation of sustainability initiatives and sustainable procurement.

These measures would work collectively to minimise the potential spoil, waste management and resource use impacts of Stage 1.

There are no mitigation measures identified in the assessment of other environmental aspects that are likely to affect the assessment of spoil, waste management and resource use.