North West Rail Link - Stage 1
Major Civil Construction Works

State Significant Infrastructure Application Report

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Contents

1 Background

1.1 Strategic context

The NWRL project responds to its strategic context which is established through a number of documents and initiatives and summarised in the following table.

Table 1: North West Rail Link strategic context

Policy or Plan	Relationship to NWRL
NSW Government Strategic Urban Planning	
NSW 2021 – State Plan Based on five principal strategies with underlying goals. A number of goals specifically aimed at access and transport including greater use of public transport (Goal 8).	NWRL helps to meet these goals by providing a significant expansion to Sydney's rail network. NWRL is to integrate with other transport systems notably rail network and bus services. Serving an area of future population growth and areas of economic and commercial focus. Contributing to the competitiveness of the region.
State Infrastructure Strategy 2008/09-2018/19 Strategy to address key infrastructure challenges including congestion, overcrowding on public transport and reliability of public transport.	NWRL provides a significant expansion to Sydney's rail network in an area of future population growth. NWRL also integrates with the existing rail and bus networks, with stations at existing T-way stops and bus interchanges. NWRL thereby makes a significant contribution to the effectiveness of public transport and reduces the need for private vehicle (car) trips especially along congested road routes into North Sydney and CBD.
Metropolitan Plan for Sydney 2036 Strategic integrated land use and transport plan. Identifies growth targets for north west subregion.	NWRL is serving a part of Sydney identified in the Metropolitan Plan and has a critical role in helping to deliver the growth targets for the subregion. As noted above, the NWRL supports and will form part of an integrated public transport system.
Draft North West Sub-Regional Strategy Provides a vision for the future role of the north west subregion. Identifies NWRL as a key transport project. NWRL corridor integrated with Area 20 precinct planning.	NWRL will support the development of the north west subregion. Consistent with precinct planning undertaken to date.

Policy or Plan	Relationship to NWRL
Federal Government Strategic Urban Planning	
State of Australian Cities Report 2011 Provides an annual overview of key themes within major cities and regions and indicates areas of change from previous years. Three of the key themes; population and settlement, productivity and liveability, cover aspects of transport and mobility.	The operation of the NWRL, with associated benefits to rates of public transport use, servicing of suburban and economic areas, is expected to be reflected through positive rates and figures – including comparison to previous years. Consequently, the assessed liveability of Sydney is expected to increase in respect of public transport services and so improved accessibility.
Our Cities, Our Future - A National Urban Policy Framework for a Productive, Sustainable and Liveable Future Outlines the government's goals under the themes of productivity, sustainability, and liveability and proposes possible directions for our cities.	The NWRL is a positive action to all three goals of the Policy as it will: • Improve productivity with accessibility improvements, use of public transport systems and the linking of suburban areas to economic growth areas • Support sustainability through improved resource use, reducing private vehicle movements, and achieving the mobility of people to required services and/or activities. • Enhances liveability through (efficient) access to facilities, supporting planning and development of new and emerging centres (suburban and commercial) and to the attributes of the city.

1.2 Project justification

The need for the NWRL has been established and documented in the project's Environmental Assessment and Concept Plan (TIDC, November 2006). Project need relates to the following issues:

- Population and employment growth predictions.
- Existing transport network constraints.
- Growth in travel demand.
- High levels of car dependency.
- Travel and access times.

1.3 Project objectives

The NWRL will be the most significant expansion of Sydney's rail network in decades. It will be designed and operated with the customer at the centre of its design philosophy. The NSW Government is committed to delivering an integrated and affordable transport system for the people of North West Sydney.

The general project objectives for the NWRL are to:

- Ensure customer needs are met through provision of an integrated and affordable transport system that links existing communities and new growth areas in Sydney's North West with jobs and services in the Global Economic Corridor (Macquarie Park - Chatswood - North Sydney - CBD).

- Implement a project design and delivery model that provides value for money.
- Improve transport network efficiency by facilitating a shift from road to rail for trips to and from the North West, to reduce bus and road congestion and improve amenity in the Sydney CBD.
- Contribute to environmental and social sustainability by minimising carbon emissions and minimising impacts on the environment, stakeholders and the community.

Provide attractive locations for new housing and jobs, supporting the Government's challenge to accommodate a large growth in population while sustaining economic and environmental character.

2 Permissibility and assessment framework

The following sections identify the Commonwealth and NSW approval and assessment processes as they apply to the NWRL project.

2.1 Commonwealth legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) prescribes the Commonwealth's role in environmental assessment for controlled actions which trigger an approval from the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities.

The NWRL is being referred to the Commonwealth Department for Sustainability, Environment, Water, Population and Communities. Should the Department advise the project is a controlled action under the EPBC Act; the action would be assessed by using one of the following assessment paths:

- Based on the information contained in the referral report.
- Based on preliminary documentation requested by the Department that would be publicly exhibited.
- Through the preparation of an EIS that would be publicly exhibited.
- Through a public enquiry.
- Through the bilateral agreement with the NSW Government. Transport for NSW understands the bilateral agreement is currently not being followed by NSW and the Commonwealth governments. However, the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities can use the agreement on a project by project basis.

2.2 NSW legislation

Permissibility of the North West Rail Link

The NWRL is permissible without development consent under the provisions of *State Environmental Planning Policy (Infrastructure) 2007*. In particular, the project falls within the definition of a rail infrastructure to be carried out by or on behalf of a public authority (clause 79). The project is not proposed to be undertaken on land reserved under the *National Parks and Wildlife Act 1974*.

The North West Rail Link as State Significant Infrastructure

The NWRL has been declared to be State Significant Infrastructure under Part 5.1 of the EP&A Act through the following mechanisms:

- Section 115U(4) of the EP&A Act allows specified development on specified land to be declared as State Significant Infrastructure. One of the mechanisms through which this has been done is clause 15 and Part 1, Schedule 4 of *State Environmental Planning Policy (State and Regional Development)* 2011 (SRD SEPP). Under Schedule 4 of the SRD SEPP, development the subject of major project application MP 06_0157 (which sought concept approval under Part 3A for what was then the NWRL project) was declared to be State Significant Infrastructure; and
- Clause 16(b) of the SRD SEPP also declares the North West Rail Link as described in Schedule 5 of the SRD SEPP as State Significant Infrastructure.

The NWRL is therefore State Significant Infrastructure and will be assessed and determined by the Minister for Planning and Infrastructure under Part 5.1 of the EP&A Act.

The North West Rail Link as Critical State Significant Infrastructure

Section 115V of the EP&A Act allows State Significant Infrastructure to be declared to be Critical State Significant Infrastructure in certain circumstances. One of the mechanisms through which this has been done is clause 16 and Schedule 5 of the SRD SEPP. Under clause 16 and Schedule 5 (clause 2) of the SRD SEPP, the NWRL project, having been declared to be State Significant Infrastructure, has also been declared to be Critical State Significant Infrastructure. The declaration, which recognises the importance of the North West Rail Link as a project that is essential for the State for economic, environmental or social reasons, provides important protections in respect of legal challenges.

The North West Rail Link as Staged Infrastructure

As noted in Section 3.2, the NWRL has an approval for Staged Infrastructure under Division 3 of Part 5.1 of the EP&A Act through the operation of savings and transitional arrangements under Schedule 6A of the EP&A Act.

3 The North West Rail Link

3.1 Project overview

The North West Rail Link (NWRL) comprises the provision of a new electrified passenger railway between Epping and Tallawong Road, Rouse Hill extending the CityRail network to North West Sydney. It would be a two track rail corridor 23km in length, comprising the following main components:

- A direct underground connection into the existing Epping to Chatswood Rail Line at Epping (ECRL).
- A service facility at Epping.
- A service facility at Cheltenham.
- Two tunnel stubs to safeguard for Parramatta to Epping Rail Link.
- Eight stations – Cherrybrook, Castle Hill, Hills Centre, Norwest, Bella Vista, Kellyville, Rouse Hill and Cudgegong Road.
- An underground section of route comprised of 15.5km of two track railway in a twin tunnel configuration with cross passages at regular intervals between Epping and Kellyville.
- A 7.5km above ground section of route from Bella Vista to Tallawong Stabling Facility, Rouse Hill, which would be a combination of viaduct, embankment, at grade and cutting.
- A stabling facility at Tallawong Road for 16 eight-car trainsets with provision for later expansion to 24 eight-car trainsets.
- Provision for a concrete batch plant and pre-cast facilities in the vicinity of Balmoral Road and Memorial Avenue, Kellyville.

The proposed NWRL alignment is shown in Figure 1.

Figure 1: Route overview

The NWRL route is described in five sections:

- From Epping and Cheltenham to Cherrybrook Station.
- From Cherrybrook Station to Castle Hill Station.
- From Castle Hill Station to Hills Centre Station and Norwest Station.
- From Norwest Station to Bella Vista Station and Kellyville Station.
- From Kellyville Station to Rouse Hill Station, Cudgegong Road Station and Tallawong Stabling Facility, Rouse Hill.

These sections are shown in the maps in Appendix A and described in the following sections.

From Epping and Cheltenham to Cherrybrook Station

NWRL would join to the CityRail network at the existing mined tunnel stubs located immediately north of the underground ECRL Epping Station platform. From this connection the alignment turns north west and descends to pass beneath Devlin's Creek and the M2 before rising on a long and relatively steep grade to the site of Cherrybrook Station, approximately 6km away from the connection point. Cherrybrook Station would be located on the corner of Castle Hill and Franklin Roads. This section of the route also includes:

- The site of the Epping Service Facility at Beecroft Road, approximately 350m from the ECRL connection.
- Connection of existing stub tunnels at Epping Station.
- Two new tunnel stubs being provided to safeguard for a future Parramatta to Epping Rail Link, located approximately 800m from the ECRL connection.
- The site of the Cheltenham Service Facility adjacent to Cheltenham Oval, approximately 1.8km from the ECRL connection.
- A cross over cavern in the vicinity of the Epping Services Facility.

From Cherrybrook Station to Castle Hill Station

Beyond Cherrybrook the route runs to the west beneath Castle Hill Road descending on a long moderate grade before turning to the south west at the location of the Castle Hill Station beneath Arthur Whitling Park. A cross over cavern is required on the city side of the Castle Hill Station. The Castle Hill Station site would be located within Arthur Whitling Park and part of Old Northern Road reserve.

This section of the route also includes Tunnel Boring Machines support services at Cherrybrook Station. The construction site at Cherrybrook currently requires validation which may result in additional property impacts.

From Castle Hill Station to Hills Centre Station and Norwest Station

West of Castle Hill Station the alignment descends and curves north westerly below the Showground Road corridor before it turns due west on the approaches to the Hill Centre Station. Two options are currently being considered for the exact location of the Hills Centre Station, referred to as the north and south option. The north option proposes the station to be located parallel but set back from Carrington Road adjacent to the showground. The south option proposes the station to be located well to the south of the showground and adjacent to Carrington Road.

Leaving the station and moving westwards the alignment passes below Cattai Creek before traversing to the south and falling gradually as it passes under the Castle Hill trading estate precinct in a south westerly direction. Just beyond Windsor Road the route curves and brings the corridor directly below the southern edge of Norwest Boulevard. Norwest Station would be located below Norwest Boulevard and on the site of two existing commercial buildings to the south.

This section of the route also includes:

- Use of Arthur Whitling Park, Castle Hill as a station construction site. The use of this site would require the removal and relocation of the war memorial, subject to ongoing discussions with the Castle Hill RSL Sub-Branch, the Castle Hill RSL Club and The Hills Shire Council. The station precinct will incorporate appropriate recognition of the current memorial.
- Temporary relocation of some bus stands and layover areas.
- Tunnel Boring Machines support site at Hills Centre Station for the Hills Centre Station to Cherrybrook Station portion of the tunnel drive.

From Norwest Station to Bella Vista Station and Kellyville Station

Leaving Norwest Station the twin tunnels continue to follow Norwest Boulevard in a south western direction up to the intersection with Solent Circuit. Past this point it begins to diverge from the Boulevard taking a southerly route on a long curved section which eventually turns the alignment around to the northwest and parallel to Old Windsor Road. The route continues in tunnel to a portal located immediately north of Celebration Drive and beyond this Bella Vista Station.

The alignment continues to follow a route located along the eastern side of Old Windsor Road and begins to climb to become elevated at a point some distance north of Balmoral Road. This elevated section of route is at first located on an earth embankment but this soon becomes an elevated rail viaduct as the route passes over an area of local floodplain in the vicinity of Samantha Riley Drive with Kellyville Station located immediately south of this road. A cross over is also located immediately south of Kellyville Station.

This section of the route also includes:

- Tunnel Boring Machines support services at the Bella Vista Station site.
- The Balmoral Road site on the corner of Old Windsor Road and Balmoral Road, to be utilised for a concrete batch plant and pre-cast facility.
- The Memorial Avenue site located on the south-eastern corner of Old Windsor Road and Memorial Avenue, to be used as a staging point for construction of the elevated concrete viaduct and for a second concrete batch plant and pre-cast facility.
- Major road works on the bus Transit Way.

From Kellyville Station to Rouse Hill Station, Cudgegong Road Station and Tallawong Stabling Facility

A twin track viaduct structure continues to the northwest from Kellyville Station following the eastern side of Old Windsor Road with Rouse Hill Station located on a section of elevated track between Rouse Hill Shopping Centre and Old Windsor Road.

From here the alignment curves sharply south to pass over Windsor Road to run towards the south west parallel and to the north of the Schofields Road corridor. The two tracks pass beneath Cudgegong Road which would be located on a new bridge. The terminal station, Cudgegong Road, would be sited just beyond in a shallow cutting. On the far side of the platforms, beyond a new bridge

carrying Tallawong Road, the two track alignment fans out into the Stabling Facility at Tallawong Road. Provision would be made for a possible future extension of the line further to the west.

This section of the route also includes:

- Windsor Road / Old Windsor Road site construction site for major road works on the bus Transit Way and viaduct launch and support.
- Windsor Road / Schofields Road construction site

3.2 Proposed applications

Concept Plan approval was granted for the NWRL under the then Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 6 May 2008 (MP 06_0157). With the recent repeal of Part 3A, the Concept Plan approval has been declared to be a Staged Infrastructure approval under Part 5.1 of the EP&A Act.

Three separate applications are proposed in order to deliver the NWRL:

- A modification request under section 115ZI of the EP&A Act.
- A State Significant Infrastructure application for Stage 1: Major Civil Construction Works.
- A State Significant Infrastructure application for Stage 2: Construction and operation of rail and station infrastructure and systems.

3.2.1 Modification request under section 115ZI of the EP&A Act

A modification request under section 115ZI of the EP&A Act, to align the existing Staged Infrastructure approval with refinements made to the NWRL since 2008 has been lodged to the Department of Planning and Infrastructure's Director-General concurrently with this State Significant Infrastructure Application.

The proposed refinements subject to the modification request are:

i. Relocate Kellyville Station from the vicinity of Burns Road, Kellyville to the vicinity of Samantha Riley Drive, Kellyville.

ii. Provide for additional stations at Bella Vista and Cudgegong Road.

iii. Minor changes to the location of Hills Centre Station.

iv. Change the Area 20 route alignment with a route alignment parallel to Schofields Road and through the Area 20 Precinct as shown in the *Area 20 Draft Precinct Planning Package* (Department of Planning and Infrastructure, May 2011).

v. Vertical alignment changes between Bella Vista and Rouse Hill.

3.2.2 State Significant Infrastructure application for Stage 1: Major Civil Construction Works

Major Civil Construction Works include all significant construction activities for the North West Rail Link, such as construction site establishment, enabling works, cut and cover construction activities including service facilities, tunnels, spoil management and disposal, worksite deliveries, bulk earthworks and construction of cuttings, embankments and viaducts.
This application and scoping document relate to the State Significant Infrastructure application for Stage 1: Major Civil Construction Works associated with NWRL, as outlined further in Section 4. The

application will be followed by an EIS that will present the environmental impacts and mitigation measures.

3.2.3 State Significant Infrastructure application for Stage 2: Construction and operation of rail and station infrastructure and systems

A second State Significant Infrastructure application will be prepared relating to the construction of those elements of NWRL not addressed by Stage 1: Major Civil Construction Works, as well as the operation of the railway. This second application will be followed by an EIS that will present the environmental impacts and mitigation measures related to:

- Construction and fit out of stations and service facilities.
- Construction of rail infrastructure and systems including:
    - Laying of tracks in concrete track structure or concrete sleepers and conventional stone ballast track.
    - Tunnel ventilation system to manage conditions (such as temperature) in the tunnel sections and stations and for emergency smoke extraction.
    - Rail signalling systems.
    - Overhead traction power supply and related supply sub-stations.
- Construction and operation of transport interchange and connection facilities (e.g. park and ride, cycle storage, bus stops), access roads, landscaping.
- Operation of the railway.
- Any land take or footprint identified for permanent works additional to the footprint identified in EIS 1.
- It would also set out the urban design for all stations and station precincts, which would be informed by the precinct planning process.

3.3 About the proponent

Transport for NSW takes the lead on all policy and planning functions of the former Transport NSW, Ministry of Transport, RailCorp, the Roads and Maritime Services, Sydney Ferries, and the Public Transport Ticketing Corporation. Further details on the proponent are provided at: www.transport.nsw.gov.au. A specialised Project Team has been established within Transport for NSW to coordinate and expedite work on the NWRL project.

4 Scope of this application – Stage 1: Major Civil Construction Works

The Major Civil Construction Works for the project will include:

- The land take or footprint for the NWRL route alignment.
- The construction processes associated with the Major Civil Construction Works which are categorised as tunnelling, earthworks and structures.

These are discussed in the following sections.

4.1 Land take or footprint for the NWRL route alignment

It comprises the land take or footprint for the NWRL route alignment, both temporary (for construction) and permanent. This includes enabling works related to establishing worksites for the major civil works with activities such as:

- Vegetation clearance and demolition of structures.
- Power supply to key worksites.
- Road widening including intersection modifications and signalised worksite entry points.
- Modifications works to the North West Transit Way and customer facilities between Bella Vista and Rouse Hill Town Centre.
- Rail services and protection works in the Epping to Chatswood Rail Link (ECRL) tunnels
- Major utilities relocation and protection.

4.2 Construction processes

4.2.1 Tunnels

The twin bored tunnels (extending from Epping for 15.5km to a tunnel portal immediately north of Celebration Drive) would have a circular cross section and an internal lined diameter of approximately 6.6m. In addition to space for the rolling stock and track form the tunnel cross section provides space for various equipment including rail signalling, controls and communication, overhead traction power, fire systems and emergency access walkways. However these are not being provided as part of the Major Civil Construction Works and would be the subject of a separate environmental assessment.

In addition to the two running tunnels connecting cross passages would be provided at regular intervals of approximately 240m to facilitate emergency egress. Two crossovers would be provided in the tunnel section, one at Castle Hill and one at Epping.

Typically the two track centrelines would be approximately 13.3m apart, allowing for a 10m platform at each island platform station. However, tunnel spacing may vary depending on construction methodology, geotechnical and other constraints. The tunnels would be lined with pre-cast concrete segments to ensure the long term life of the asset and minimise groundwater ingress.

The topography along the corridor varies greatly particularly in the vicinity of watercourses; therefore tunnel depth would vary depending on proximity to stations and geological constraints within the corridor. The tunnel crown (top of the tunnel) is located in a range of depths from 10m to 70m below

ground surface. On average the tunnels are more typically in the 20-25m depth range and tunnel depth tends to be at its shallowest at station location, beneath watercourses and at the northern tunnel portal.

4.2.2 Earthworks

Celebration Drive to Balmoral Road

From the tunnel portal north of Celebration Drive the route emerges on to a section of retained cutting, approximately 1,200m in length passing beneath Balmoral Road which would be located on a new overbridge structure. At its deepest point the cutting would be 15m deep retained along both sides with a formation width sufficient for a twin track electrified railway with a dedicated vehicular maintenance access road located along the eastern edge.

Balmoral Road to South Memorial Avenue

From Balmoral Road, the alignment would transition from cutting to a short section of embankment and then into viaduct south of Memorial Avenue.

Terry Road Retained Cut and Embankment

At the northern end of the viaduct beyond Rouse Hill the topography rises briefly and the corridor passes into a short section, approximately 650m, of retained open cut adjacent to Terry Road. Just beyond Terry Road the corridor passes onto a short section, approximately 150m, of embankment on the approaches to the Second Ponds Creek bridge structure.

Cudgegong Road Embankment and Station and Stabling Yard Cutting

A short section of embankment, approximately 125m, carries the rail corridor formation from beneath the new Cudgegong Road overbridge onto the adjacent Second Ponds Creek underbridge.

The final section of route contains Cudgegong Road Station and, further to the west, the Tallawong Stabling Facility. Here the entire rail corridor would be located in a cutting up to 13.5m below the existing ground level and over a distance of approximately 1,020m.

A crossover would be provided at Cudgegong Road Station at surface level.

Station earthworks

Six of the eight stations would involve earthworks construction (with Kellyville and Rouse Hill Stations elevated on viaduct). Station earthworks construction falls into a number of typologies summarised in the following table.

Table 2: NWRL station typologies

Station	Typology	Metres from ground level
Cherrybrook	Open Retained Cut Box Structure	18-29m below
Castle Hill	Cut and Cover Box Structure	25m below
Hills Centre	Open Retained Cut Box Structure	15-21m below
Norwest	Open Retained Cut Box Structure	11-15m below
Bella Vista	Open Retained Cut Box Structure	12m below
Kellyville	Viaduct	Between 5 and 10m above
Rouse Hill	Viaduct	Between 5 and 10m above
Cudgegong Road	Shallow Cutting	7m below

4.2.3 Structures

Viaduct

To the north of Balmoral Road the alignment reaches existing ground level but continues to climb as the rail corridor transitions onto an elevated viaduct structure. This structure would be approximately 4.2km in length from Balmoral Road to the western side of Windsor Road passing above areas of land subject to occasional flooding. The form of the structure would be a prestressed box girder with a deck approximately 13m in width with spans of between 36m to 48m in length to carry the twin track railway with provision for access walkways on both sides. The structure would feature two wider sections to provide the two elevated stations – Kellyville Station and Rouse Hill Station. The structure would also include longer span sections over Memorial Avenue, Samantha Riley Drive, Windsor Road, Sanctuary Drive, White Hart Drive, Schofields Road and Old Windsor Road. One cross over would be provided in the elevated section immediately south of Kellyville Station.

Bridges

There are a number of additional bridge structures as set out in the following table.

Table 3: Proposed bridge structures

Bridge location	Approximate span	Type
Balmoral Road	40 m	Road overbridge
Memorial Avenue	50 m	Rail underbridge
Samantha Riley Drive	50 m	Rail underbridge
Windsor Road	50 m	Rail underbridge
Sanctuary Drive	40 m	Rail underbridge
White Hart Drive	40 m	Rail underbridge
Windsor Road	2 spans of 70 m	Rail underbridge
Terry Road	28 m	Road overbridge
Second Ponds Creek Bridge	18 spans of 16 m	Rail underbridge
Cudgegong Road	28 m	Road overbridge
Tallawong Road	32 m	Road overbridge

Service Facility

A service facility would be provided at Epping for the tunnel ventilation plant and equipment necessary to connect NWRL to the existing Epping to Chatswood Rail Link. This facility would be located at Beecroft Road. The below ground shaft structure would be approximately 20m deep with a surface footprint 15m by 20m in plan. Associated with the structure would be a number of above ground structures/buildings which would be the subject of a separate environmental assessment.

An intermediate service facility would be provided at Cheltenham for the tunnel ventilation plant and equipment required for the long tunnelled 6km section of route between Epping and Cherrybrook. This facility would feature a below and above ground component and would be on the western side of Cheltenham Oval. It would include a below ground shaft structure approximately 35m deep with a floor plan of approximately 20m by 20m. A related ground level entrance structure would be required for emergency response purposes.

4.3 Construction sites

A number of construction sites would be required as part of the Major Civil Construction Works. This includes locations for Tunnel Boring Machine (TBM) and road header launch, TBM and road header retrieval, TBM support, viaduct and earthworks support, station construction, services facilities construction, and concrete batching and pre-cast facilities.

Any single construction site may have multiple functions, e.g. the Cherrybrook Station construction site would be utilised for station construction, and TBM launch, support and retrieval. A description of the main activities to be carried out at each site is presented in the following table.

Table 4: Major construction sites

Construction site	TBM Launch	TBM Support	TBM Retrieval	Spoil Removal	Road header launch and support	Station construction	Viaduct launch and support	General civil works	Concrete pre-cast facility
Epping				✓	✓				
Cheltenham				✓	✓				
Cherrybrook Station	✓	✓	✓	✓		✓			
Castle Hill Station				✓	✓	✓			
Hills Centre Station		✓		✓		✓			
Norwest Station				✓		✓			
Bella Vista Station	✓	✓		✓	✓	✓		✓	
Celebration Drive to Balmoral Road								✓	✓
Balmoral Road to Memorial Avenue							✓	✓	✓
Memorial Avenue to Samantha Riley Drive							✓	✓	
Kellyville Station						✓	✓	✓	
Windsor Road to White Hart Drive							✓	✓	
Rouse Hill Station				✓		✓	✓	✓	

Construction site	TBM Launch	TBM Support	TBM Retrieval	Spoil Removal	Road header launch and support	Station construction	Viaduct launch and support	General civil works	Concrete pre-cast facility
Windsor Road crossing to Cudgegong road							✓	✓	
Cudgegong Road Station						✓		✓	
Tallawong Stabling Facility				✓				✓	

4.4 Stage 1 program

Subject to obtaining the required planning approval, construction for Stage 1 of the NWRL is expected to commence in the second quarter of 2013. It is anticipated that the site would be progressively handed over to the Stage 1 construction contractor between the second quarter of 2015 and the first quarter of 2016. The total period of Major Civil Construction Works is expected to be approximately three and a half years.

4.5 Capital investment value

Building on over 10 years of work, a detailed capital cost for the NWRL project is being prepared based on detailed cost planning by specialist cost advisers. The indicative project budget estimate for the overall NWRL project (incorporating the Major Civil Construction Works which are the subject of this report) is in the order of $7.5-8.5 billion (gross for infrastructure excluding rolling stock) and subject to ongoing input.

5 Consultation

This section describes recent and proposed consultation activities for Stage 1 of the NWRL. It also responds to the issues raised during the recent consultation activities.

To date there have been a number of phases of consultation about plans for a NWRL:

- Publication of the initial Overview Report (2002).
- During the development of Environmental Assessment and Concept Plan (2005-7).
- Publication of the Preferred Project Report (2007) and Supplementary Submissions Report (2008).
- Consultation about the Project Overview Report (2011).

Current consultation activities accompanying the NWRL planning approvals process are guided by the Staged Infrastructure approval.

5.1 Previous consultation

The first opportunity the public had to comment on the NWRL occurred following the publication of *Action for Transport 2010* (NSW Government, November 1998).

Consultations during the preparation of the *North West Rail Link Environmental Assessment and Concept Plan* (TIDC, 2006) commenced in November 2005 and included:

- Residents within 250m of the proposed alignment.
- Statutory agencies.
- Other key stakeholder groups such as environmental, community and business.

A total of 61 submissions were received from the public and the issues raised were addressed in the Environmental Assessment when it was lodged with the Department of Planning and Infrastructure (former Department of Planning). The government agency and local government consultations were similarly reported.

Following lodgement, the former Department of Planning put the plan on Public Exhibition. Over 1,600 submissions were received during and immediately following public exhibition.

In February 2007, the Director-General required responses to the issues raised in the submissions. The *North West Rail Link Preferred Project Report* (TIDC, 2007) was prepared, which provided responses to issues raised in submissions received during the public exhibition of the Environmental Assessment. It also included information about additional studies undertaken since the assessment was placed on public exhibition, and provided details on proposed modifications to the concept plan as described in the assessment.

The *Preferred Project Report* was then put on public exhibition with submissions received including over 3,000 form letters and 338 other individual submissions up to August 2007. This resulted in the publication of a *North West Rail Link Supplementary Submissions Report* in March 2008 in which the issues raised were addressed.

It should be also noted that the 2008 consultations for the *Area 20 Precinct Planning* process received eight submissions relevant to the NWRL project.

5.1.1 Conditions of approval

The approval conditions for the Concept Plan (now Staged Infrastructure) outline an extensive process of stakeholder engagement during the development of detailed project design criteria and State Significant Infrastructure applications for the NWRL. These approval conditions have been and will continue to guide the consultation during the planning approvals process for NWRL.

The approval conditions define stakeholders as:

- Relevant Councils (Hornsby Shire Council, Hills Shire Council and Blacktown City Council).
- Relevant Government Agencies.
- Any Commonwealth or state agency that has a statutory or other interest in the project. Agencies / Authorities noted in the approval include Department of Planning and Infrastructure, Growth Centres Commission (now within DPI), DECC (now Office of Environment and Heritage in Department of Premier and Cabinet), MoT (now Transport for NSW), DWE (now NSW Office of Water), NSW Fisheries (now NSW Fisheries), RailCorp, RTA (now Road and Maritime Services), Landcom and the Commonwealth Department of Sustainability Environment Water Population and Communities.
- Relevant Stakeholders.
- A party that would be directly affected by the project or would otherwise have a reasonable interest in the project such as affected landowners, utility and service providers, business, bus companies and community members.

On-going consultation requirements as part of the approval conditions include conditions 2.1, 2.2, 2.3, 2.4, 3.1(e)(f) and 3.14 (Refer to Appendix B). Statement of Commitments numerals 2, 3, 6, 9, 13, 14, 15, 21 and 33 also specifies actions regarding consultation (Refer to Appendix C).

5.1.2 Project overview report

In July 2011 a *North West Rail Link Project Overview* was exhibited for public display and comment. Over 2,000 people received further information about the NWRL from a number of sources including the project's website (http://northwestrail.com.au), by visiting the Castle Hill Community Information Centre (located at 299 Old Northern Road, Castle Hill), by attending one of eight community information sessions held across north west Sydney, or by phone (1800 019 989) and email (info@northwestrail.com.au). 184 submissions were received in response as shown in Figure 2.

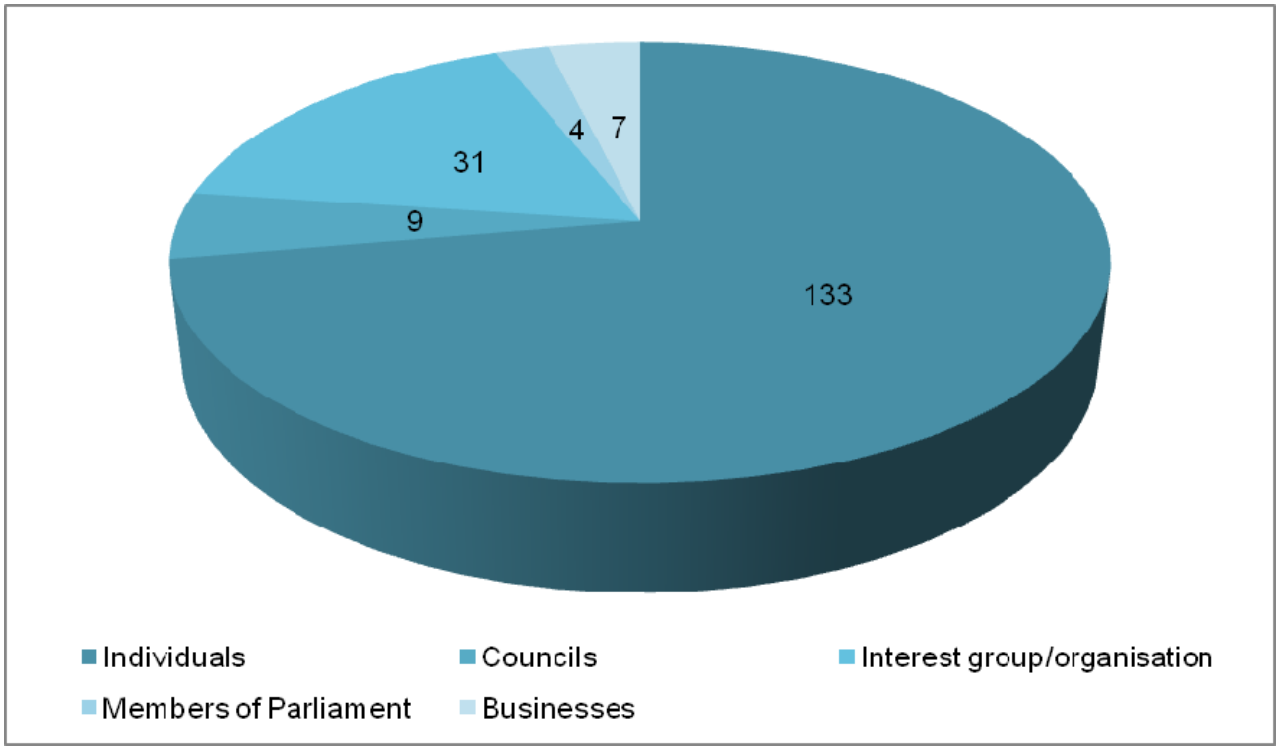

Figure 2: Submissions received during the public display of the North West Rail Link Project Overview

The main categories of issues raised were:

- Alternative considerations: This category encompassed community feedback regarding alternatives to the proposed project scope.
- Traffic, parking and public transport issues: This category addressed issues related to commuter facilities such as car parking and general responses in relation to station/network accessibility and planning for other transport connections.
- Route alignment: Issues raised in relation to the proposed route alignment, including comments regarding stations, location and rail corridor (tunnel) are considered under this category.
- Project justification: This issue category encompassed issues and questions raised in relation to project funding and/or expenditure as well as requests for investment in other transport alternatives (outside of the project scope).
- Land use planning: This category considered comments and responses regarding future land use planning in relation to the project.
- Construction practices and timing: These issues related to comments received regarding construction staging and timing and property/business access during construction.
- Communication & consultation issues: This category considered issues raised with regard to future communication material and consultation activities.

These and other issues were addressed by Transport for NSW in the *Project Overview Issues Report* (November, 2011).

5.2 Current and future consultation

Consultation for the planning approvals work is on-going and largely driven by the Staged Infrastructure approval conditions. In addition to the *Project Overview* consultation, the following key stakeholder meetings have occurred on matters directly reacted to planning approvals and others studies:

- Roads and Maritime Services.
- Department of Planning and Infrastructure.
- Interagency Reference Group.
- The Office of Environment and Heritage.
- Indigenous stakeholders.

Dates are being planned for meetings with:

- Commonwealth Department of Sustainability, Environment, Water, Population and Communities.
- A series of Technical Working Groups comprising:
    - Councils.
    - Government agencies.
    - Bus operators.
    - Key landowners.

There will also be a number of consultation activities to support the public exhibition process for the two Environmental Impact Statements to ensure that the community and interested parties are able to make informed responses to the proposals.

Future consultation and communication activities will be driven by:

- Public announcements that further define the project ensuring that accurate information is available.
- Statutory consultation requirements that accompany the various approvals that will be required.
- Consultation events that accompany public exhibitions of information as part of the environmental assessment process.
- Any additional Director-General's requirements which may be issued.
- Four Place Managers have been appointed, each responsible for a clearly defined component of the project. The Place Managers will act as the single direct point of contact with the local community.
- Community Information Centre at Castle Hill.

6 Key environmental issues

This section identifies the key environmental issues related to the NWRL Major Civil Construction Works, lists the Staged Infrastructure approval conditions and statement of commitments related to the identified environmental issues and provides details on the proposed assessment to be carried out as part of the Major Civil Construction Works Environmental Impact Statement.

Key environmental issues are those that may have high or moderate impacts (actual or perceived) and assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts. The identification of key environmental issues was based on a review of the following sources:

- NWRL Concept Plan documentation, including the *Environmental Assessment and Concept Plan* (TIDC, November 2006), the *Preferred Project Report* (TIDC, May 2007) and the *Supplementary Submissions Report* (TIDC, March 2008).
- Environmental investigations and consultation undertaken as part of the Area 20 Precinct Plan.
- Community consultation undertaken for the project as documented in Section 5.
- Work in progress environmental investigations being undertaken for the project.

Transport for NSW has identified the following key environmental issues will require further detailed assessment and may require project specific impact mitigation measures as part of the Environmental Impact Statement:

- Land use, property and infrastructure planning.
- Construction traffic, transport, parking and access.
- Construction noise and vibration.
- Ecology.
- Aboriginal heritage and non-Aboriginal heritage.
- Soils and groundwater.
- Surface water and flooding.
- Visual impacts, landscape and urban design.
- Social and economic impacts.

The environmental issues and the proposed further assessments discussed in this Chapter are subject to the environmental assessment requirements issued for the EIS.

6.1 Land use, property and infrastructure planning

6.1.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to land use, property and infrastructure planning for Stage I are shown in the following table.

Table 5: Land use, property and infrastructure planning - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
2.1, 3.2	6, 7, 8, 9, 10.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.1.2 Summary of issues

The main issues for the NWRL Major Civil Construction Works are:

- Land uses within the surface alignment may change as a result of Stage 1 major civil works.
- Permanent land fragmentation between the proposed Area 20 Precinct alignment and Schofields Road.
- Partial or full acquisition of approximately 130 properties in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991*. Of these, the NSW Government owns 64 properties. No Commonwealth properties would be impacted.
- Temporary impacts and disruption to adjacent properties, particularly in the vicinity of construction sites.
- Some of the existing public utility infrastructure would need to be relocated.
- Stage 1 construction works would require adjustments and relocation of some of the existing utility infrastructure.

6.1.3 Proposed further assessment and mitigation

- Undertake further assessment and investigations in accordance with existing approval conditions and statement of commitments.
- Identification of potential impacts on infrastructure in the immediate vicinity of construction sites and the proposed alignment.
- Impact on existing and planned utility infrastructure.
- Utility relocation and protection measures.

6.2 Construction traffic, transport, parking and access

6.2.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to traffic, transport, parking and access relevant to Stage 1 are shown in the following table.

Table 6: Traffic, transport, parking and access - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
2.5	16, 17, 18, 29.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.2.2 Summary of issues

Major Civil Construction Works has the potential to impact on local and regional traffic flows. The main issues for the NWRL Stage 1 are:

- Road modifications, either to provide access and egress from the construction sites or to allow the proposed construction works to take place. The modifications associated with each construction site are detailed in Table 8.
- Additional road modifications to those listed in Table 8 may be required to provide safe access and egress points to the construction sites depending on the requirements of the road owner and the construction contractor.
- Increase in the volumes of light and heavy vehicles on local roads surrounding construction work sites and arterial roads, potentially leading to some delays at intersections and amenity issues. Stage 1 would require about 127,000 truck loads to dispose spoil from tunnelling works and about 19,000 truck loads to dispose spoil from surface works.
- Traffic volumes would potentially generate:
    - Temporary disruption to traffic flows, car parking, pedestrian and cycle links, bus service routes and the North West Transit Way as a result of staged construction works.
    - Temporary increase in parking demand on local streets where construction workers could not be accommodated within construction sites.

Table 7: Stage 1 traffic and transport issues

Construction site	Proposed access route	Proposed road modification
Epping Services Facility	Direct to and from Beecroft Road (left in, left out only)	Access to Beecroft Road. Access to adjacent commercial buildings from Beecroft Road.
Cheltenham Services Facility	Light vehicles - Murray Road and Castle Howard Road. Heavy vehicles - two options being considered: M2 Motorway and Kirkham Street.	M2 Motorway option: ingress and egress lanes. Kirkham Street option: access road to Kirkham Street. Access road to Murray Road. Possible deceleration and acceleration lanes via the M2 Motorway to and from the site.
Cherrybrook Station	Direct to and from Castle Hill Road	New signalised intersection at the intersection of Glenhope and Castle Hill Roads.
Castle Hill Station	Old Northern Road and Terminus Street	Temporary partial closure of Old Northern Road.

Construction site	Proposed access route	Proposed road modification
		Temporary relocation of bus interchange and layover.
Hill Centre Station	Access direct to Showground Road and access via Carrington Road.	New intersection on Showground Road.
Norwest Station	Direct access via Norwest Boulevard and access via Brookhollow Avenue	Temporary partial closure of Norwest Boulevard.
Bella Vista Station	Celebration Drive	North West Transitway road works.
Balmoral Road	Balmoral Road	Balmoral Road road works.
Memorial Avenue	Memorial Avenue	North West Transitway road works.
Kellyville Station	Samantha Riley Drive	Access on and off Samantha Riley Drive. Internal access roads linking to Memorial Avenue construction site.
Windsor Road Site	Old Windsor Road	North West Transitway road works.
Rouse Hill Station	Windsor Road	North West Transitway road works. Temporary relocation of bus station.

6.2.3 Proposed further assessment and mitigation

Undertake further consultation, assessment and investigations as per existing approval conditions and statement of commitments. The assessment will include:

- Assessment of traffic impacts as a result of NWRL Stage 1 including impacts on the North West Transit Way and construction impacts on future on planned road upgrades including the Schofields Road upgrade. JV: Confirm whether impact assessment would include undertaking traffic modelling for the Major Civil Construction Works.
- Assessment of impacts on accessing recreational, commercial and industrial areas along the corridor including pedestrian and bike access.
- Impact of proposed road, cycleways and footpaths modifications, road detours and road and lane closures.
- A construction traffic management strategy with measures to manage traffic generated from spoil transportation, haulage methods and routes.
- Cumulative traffic and transport impacts from surrounding development and concurrent construction sites.

6.3 Construction noise and vibration

6.3.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to construction noise and vibration for Stage 1 are shown in the following table.

Table 8: Construction noise and vibration - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
3.6	20, 21

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.3.2 Summary of issues

Stage 1 noise and vibration impacts are primarily related to construction activities. The main issues for the NWRL Stage 1 are:

- Construction traffic noise.
- Noise and vibration from construction plant and equipment during tunnelling and surface operations.
- Potential noise and vibration impacts on sensitive receivers and land uses located in proximity to the construction sites. Sensitive receivers include The Hills Council Chambers, Hills Centre and the Hillsong Church.
- Tunnelling works would occur 24 hours 7 days a week.

6.3.3 Proposed further assessment and mitigation

A detailed noise and vibration assessment of the proposed construction activities for Stage 1. This will include:

- Update existing noise background information.
- Review and update of potential noise emissions associated with Stage 1 of the project and sensitive receivers.
- Refinement of construction noise and vibration criteria and goals presented in the Staged Infrastructure approval environmental assessment.
- Vibration impacts on heritage buildings.
- Identification of construction noise and vibration mitigation measures.

6.4 Ecology

6.4.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to ecology for Stage 1 are shown in the following table.

Table 9: Ecology - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
2.8, 3.13.	25, 26, 27 28.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.4.2 Summary of issues

The main issues for the NWRL Stage 1 are:

- Endangered ecological communities listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act) have been identified along the proposed alignment and would require clearing as a result of Stage 1 works.
- The Cumberland Land Snail (*Meridolum corneovirens*) is listed as endangered under the TSC Act and has been also identified along the proposed alignment. Habitat for this species would be cleared as a result of Stage 1 works.
- Potential impact on other threatened species.
- A small area of endangered natural vegetation within the non-certified portion of the Area 20 Precinct would need to be cleared.
- Potential impact on riparian vegetation and aquatic ecology.
- Potential impact on migratory species habitats and habitat connectivity.

6.4.3 Proposed further assessment and mitigation

- Additional surveys would be undertaken along the proposed alignment.
- Continue liaison with State and Commonwealth agencies to determine mitigation and offset measures for biodiversity impacts arising from Stage 1 (and Stage 2) of the project.

6.5 Aboriginal and non-Aboriginal heritage

6.5.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to Aboriginal heritage for Stage 1 are shown in the following table.

Table 10: Aboriginal heritage - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
3.14, 3.15.	30, 31, 32, 33, 34.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.5.2 Summary of issues

The main issues associated with Aboriginal and non-Aboriginal heritage for the NWRL Stage 1 are listed below.

Aboriginal heritage

- Potential impacts on known sites containing Aboriginal artefacts or areas of potential archaeological deposit.
- Potential impact on areas of moderate archaeological potential in the Cherrybrook and Hills Centre Station sites and in the Area 20 Precinct.
- Deerubbin Local Aboriginal Land Council and other Aboriginal groups have an interest in the alignment area.

6.5.3 Non-Aboriginal heritage

- Potential direct impact on non-Aboriginal heritage items (listed and unlisted) located within the proposed stations footprint or construction sites.
- Potential direct and indirect impacts on the cultural values (including its curtilage and vistas) of non-Aboriginal heritage items (listed and unlisted) located on close proximity to the surface alignment and construction sites.

6.5.4 Proposed further assessment and mitigation

Aboriginal heritage

- The heritage assessments would need to be updated to reflect the changes to the proposed alignment, particularly in the vicinity of Norwest Business Park.
- Continue the consultation with the Deerubbin Local Aboriginal Land Council and other Aboriginal groups that have an interest in the alignment area.

Non-Aboriginal heritage

- Update additional field survey.
- Update existing non-Aboriginal heritage assessment.
- Additional research to determine the history and heritage significance of unlisted items identified during the Staged Infrastructure approval environmental assessment and any additional sites identified in the recent field investigations.
- Undertake site specific archaeological assessments for archaeological sites identified during the Staged Infrastructure approval environmental assessment and any additional sites identified in the recent field investigations.

6.6 Soils and groundwater

6.6.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to geology, geotechnical and groundwater for Stage 1 are shown in the following table.

Table 11: Geology, geotechnical and groundwater - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
3.7, 3.8.	35.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.6.2 Summary of issues

The main issues for the NWRL Stage 1 are:

- Generation of spoil which would potentially include contaminated soils, acid sulphate soils and erosive soils. These types of soils would need to be appropriately managed.
- Tunnelling would potentially impact on existing groundwater conditions (including seasonal variability and groundwater quality) and on groundwater users.
- Potential for land subsidence and settlement impacts on existing and future structures along and in vicinity of the alignment.
- Potential of groundwater drawdown that would impact on groundwater dependent ecological communities.
- Potential of surface cracking on river beds that would impact riparian and stream ecology.
- Groundwater inflow in the tunnel would need to be managed and appropriately disposed.

6.6.3 Proposed further assessment and mitigation

Transport for NSW would undertake detailed geotechnical and groundwater field investigations that would be used to assess the impacts on the existing groundwater and geotechnical conditions and inform the Stage 1 construction requirements.

6.7 Surface water and flooding

6.7.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to hydrology and surface water for Stage 1 are shown in the following table.

Table 12: Hydrology and surface water - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
2.7, 3.9, 3.10, 3.11, 3.12.	36, 37, 38, 39.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.7.2 Summary of issues

The main issues for the NWRL Stage 1 are:

- Impact on the quality of the stormwater and water bodies from construction activities.
- Potential impact on water body beds (e.g. bed cracking) or potential loss of surface water flow in tunnelled section beneath the creeks.
- Stage 1 surface structures would potentially change the existing flood conditions along the surface corridor.
- Flood risk of construction sites.
- Potential for flood water entering the tunnel.

6.7.3 Proposed further assessment and mitigation

JV: Further assessment is currently being determined.

6.8 Visual impacts, landscape and urban design

6.8.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure approval conditions and statement of commitments related to visual impacts, landscape and urban design for Stage 1 are shown in the following table.

Table 13: visual impacts, landscape and urban design - approval conditions and statement of commitments

Approval conditions[1]	Statement of commitments[2]
3.16.	40, 41, 42, 43, 44.

[1]Source: *Concept Plan Approval*, Department of Planning and Infrastructure on 6 May 2008 (See Appendix B).

[2]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.8.2 Summary of issues

The main issues for the NWRL Stage 1 are:

- Visual impacts associated with construction sites, including the use of machinery, construction activities and materials, particularly where sensitive viewing receptors exist within the visual catchment.
- The loss of vegetation that currently provides shade, screening and visual landscape amenity.
- Stage 1 surface structures would add a new visual element in the landscape.

6.8.3 Proposed further assessment and mitigation

- Overall urban design guidelines would be prepared, including urban design principles to guide design development for the major civil works.
- An assessment of how urban design guidelines and principles have been applied to Stage 1.
- Visual assessment of Stage 1 construction elements would be undertaken.

6.9 Social and economic impacts

6.9.1 Staged Infrastructure approval conditions and statement of commitments

Staged Infrastructure statement of commitments related to social and economic for Stage 1 are shown in the following table. None of the Staged Infrastructure approval conditions are directly relevant to social and economic impacts.

Table 14: Social and economic - approval conditions and statement of commitments

Approval conditions	Statement of commitments[1]
None.	45.

[1]Source: *North West Rail Link Supplementary Submissions Report*, Transport Infrastructure Development Corporation, March 2008 (See Appendix C).

6.9.2 Summary of issues

The main issues for the NWRL Stage 1 are:

- Potential changes in the value of land above (in the case of the tunnelled section) and surrounding the alignment.
- Increased employment during construction activities.
- Potential impact on access to existing businesses and community facilities located in proximity to the construction sites and surface alignment.
- Severance of future Area 20 Precinct communities by the addition of an additional physical barrier (additional to Schofields Road).
- Amenity impacts including noise and vibration, changes to traffic, public transport routes, bus stops and parking; visual impacts; and air quality (dust) impacts.
- Acquisition and dislocation of businesses, community facilities and residential dwellings.

6.9.3 Proposed further assessment and mitigation

- Update social and demographic analysis with the latest available ABS census and update existing social and economic impact assessment including detailed assessment of potential local business, residents and community facilities impacts in the vicinity of construction sites.
- Continue with community and businesses consultation and engagement activities.

7 Other environmental issues

This section identifies and describes other environmental issues related to the NWRL Stage 1 and provides details on the proposed assessment to be carried out for these issues as part of Stage 1 Environmental Impact Statement.

Transport for NSW considers the following environmental issues to be of lesser consequence taking into consideration the project scope, the existing environment and the implementation of standard management and safeguard measures:

- Air quality.
- Greenhouse gases.
- Waste management and resource.
- Cumulative impacts.

It is expected that these environment issues would not likely be key issues. However, the potential impact of these other environmental issues would be assessed further in any future environmental impact statement for the project.

None of the issues identified in this section have relevant Staged Infrastructure approval conditions or statement of commitments.

7.1 Air quality

7.1.1 Summary of issues

Stage 1 construction activities would potentially affect the quality of the air from:

- Earthworks and spoil removal.
- Road header launch, support and retrieval.
- Tunnel boring machine launch, support and retrieval.
- Services facility construction.
- Building demolition.
- Station cavern excavation.
- Concrete precast facility.
- General civil works.
- Viaduct launch and support.

The main impact on the surrounding air quality would be from the potential to generate dust emissions during construction. Any earthworks, particularly where large volumes of spoil are being moved has the potential to result in emissions of particulate matter. Additional dust sources during construction would include spoil stockpiles, operation of plant and equipment, heavy vehicle movement, demolition of buildings and the concrete precast facility. The quantity of dust generated is dependent on both the type of machinery and construction technique employed.

As the majority of the rail tunnel would be constructed below ground, dust impacts would mainly be confined to the areas where the proposed alignment is above ground, or in areas where 'cut and cover' tunnels, station cavern excavation and services facilities are proposed.

7.1.2 Proposed further assessment and mitigation

A dust management plan would need to be prepared as part of the environmental management framework being developed for the project.

7.2 Greenhouse gases

7.2.1 Summary of issues

NWRL Stage 1 would generate greenhouse gas emissions as follows:

- Emissions and energy use associated with the extraction and processing of construction raw materials, such as gravel, concrete, steel and sand.
- Emissions from transport of construction materials from their extraction and processing locations to the site.
- Emission from transport of spoil generated.
- Fuel use by bulldozers, excavators, trucks and other equipment.
- Emissions associated with the removal of vegetation.
- Use of grid electricity during construction.
- Transportation and landfill disposal of construction waste.

7.2.2 Proposed further assessment and mitigation

Assessment of energy and greenhouse gases emissions from NWRL Stage 1 and identification of measures for potential reduction of emissions.

7.3 Waste management and resource use

7.3.1 Summary of issues

Stage 1 would generate a number of different types of waste, which would require management and disposal in accordance with relevant state legislation and government policies.

7.3.2 Proposed further assessment and mitigation

A waste management plan would be prepared for Stage 1 construction works.

7.4 Cumulative impacts

7.4.1 Summary of issues

Stage 1 construction program would potentially overlap with the Schofields Road upgrade, developments at Area 20, the construction of the Rouse Hill Regional Centre, the Castle Hill Towers shopping centre expansion and other known future developments. This overlapping would potentially result in cumulative property, traffic, noise, vibration, flora and fauna, heritage, groundwater, hydrology and visual, social and economic and air quality impacts.

7.4.2 Proposed further assessment and mitigation

A cumulative impact assessment would be prepared for NWRL Stage 1.

8 Next steps

Following the submission of this application the Director-General is to prepare and notify the environmental assessment requirements for the NWRL Major Civil Construction Works if required.

Transport for NSW will prepare the environmental impact statement in accordance with the environmental assessment requirements issued by the Director-General and with the existing relevant conditions of approval and statement of commitments for the approved Staged Infrastructure.

The environmental impact statement would be publicly available for at least 30 days. During that period, any person (including a public authority) may make a written submission to the Director-General concerning the matter.

9 References

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Appendix A Route alignment drawings

Appendix B Approved Staged Infrastructure conditions of approval

Appendix C Approved Staged Infrastructure statement of commitments