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# ENVIRONMENTAL ASSESSMENT

Site Remediation of former tram  
depot site, Balmain Road, Leichhardt

## VOLUME ONE



November 2005

FOR STATERAIL

b cubed sustainability Pty Ltd



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# 1 INTRODUCTION

## 1.1 Overview

StateRail proposes to remediate contaminated land at Balmain Road, Leichhardt. StateRail has entered into a Voluntary Remediation Agreement (VRA) with the Department of Environment and Conservation (DEC) in relation to the onsite contamination. Accordingly, this *Environmental Assessment* has been prepared to meet the requirements established by Part 3A of the *Environmental Planning and Assessment Act, 1979*. The Environmental Assessment relies on a range of detailed investigations completed on behalf of StateRail.

The site over the years has been used for a wide range of activities including Naval stores and a tram depot. Most recently, the two portions of the site have been sold by StateRail to the State Transit Authority (STA) and the Department of Education and Training (DET) respectively. DET has procured a portion to provide adequate area for development of a playing field associated with Leichhardt High School. The playing field will also encompass Moore Street West following its closure. Development consent was issued by Leichhardt Council on 10 March 2003 for the closure of Moore Street West and the development of the playing field.

A detailed Remediation Action Plan (URS, 2005) has been prepared for the site which details the method of remediation and also establishes environmental impact management strategies. This Environmental Assessment concludes that the activity can be undertaken with minimal impact on the environment.

## 1.2 Consultation

Key stakeholders including Leichhardt Council (the Council), the NSW Heritage Office, DEC and the NSW Roads and Traffic Authority (RTA) have been consulted during the preparation of the sub-studies held in Volume 2 of this Environmental Assessment. In addition to this consultation, local residents have received letterbox drops prior to any environmental investigations completed on the site over an extended period.

A Project Steering Committee comprising representatives of Leichhardt High School's P&C, Council, DET, Department of Environment and Conservation (DEC) and StateRail has convened monthly since July this year. The expectations

and needs of the various representatives have been incorporated into the proposed activity.

Council's Traffic Committee (including the RTA) has set traffic criteria for the school playing field and closure of Moore Street West.

### 1.3 Site location and description

#### 1.3.1 Location and adjoining land uses

The subject site is in the suburb of Leichhardt, approximately 5 km west of the Sydney CBD. Situated to the south of the City West Link, the site is bounded by Balmain Road, Leichhardt High School and Derbyshire Road. The site's northern boundary is formed by the State Transit Authority's Leichhardt Bus Depot and a vacant parcel of land. Historically, the land portion south of the existing City West Link was occupied by the Leichhardt Tram Depot, with the subject site forming the southern third of this portion. The site also includes the existing Moore Street West.

The site covers an area of approximately 1.4 hectares and is subdivided into two lots:

- Lot 10 of DP 1016734 (also known as Area A); and
- Lot 11 of DP 1016734 (also known as Area B).

Both lots have been recently divested by State Rail, with Lot 10 now owned by the STA and Lot 11 by DET.

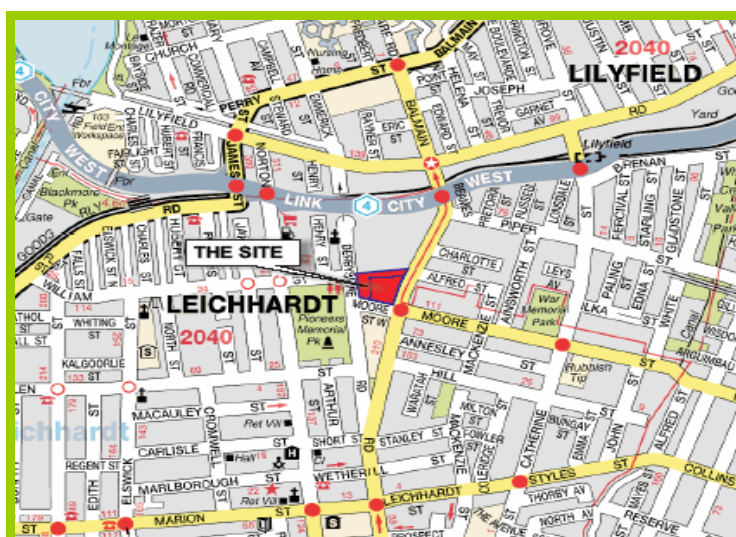


Figure 1: Location of site<sup>1</sup>

<sup>1</sup> Map reproduced with permission of UBD. Copyright Universal Press Pty Ltd. DG 12/03

Surrounding zones and land uses are shown below in the Leichhardt Local Environmental Plan Zoning Plan.

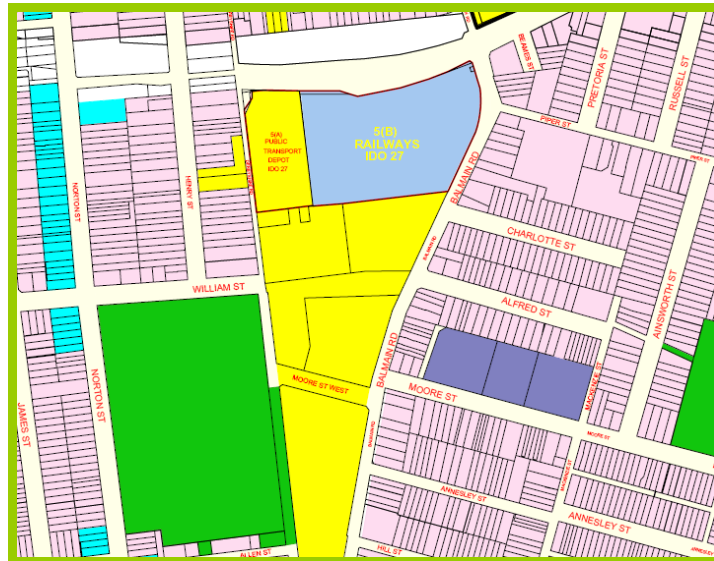


Figure 2: Zoning Map<sup>2</sup>

From this plan, it can be seen that the site's immediate surrounds comprise a number of different land uses. To the west of the site are Derbyshire Street and the Pioneers Memorial Park, with residences along William Street. Leichhardt High School is to the south and the Bus Depot lies to the north. The adjacent land uses to the east primarily comprise single-storey detached residential dwellings and a small light industrial area on the northern side of Moore Street.

### 1.3.2 Site Description and Land uses

The site is currently disused as a major functioning depot. The main built features are the former Cable Store and Traffic Office - remnants of the Leichhardt Tram Depot, which are currently vacant. Both these buildings are understood to be heritage listed under the Leichhardt Council *Local Environment Plan 2000* and are to remain part of the proposed developed site. Figure 3 below outlines the site boundary, the Cable Store and Traffic Office, Area E - owned by State Transit Authority (STA) and the STA Depot (blue).

<sup>2</sup> Leichhardt Municipal Council - <http://www.lmc.nsw.gov.au>





Figure 3: Site boundary (yellow) including Cable Store and Traffic Office (red), Area E - owned by State Transit Authority (STA) (green), the STA Depot (blue) and DEC land (purple)<sup>3</sup>

The southern part of the site is currently vacant. A concrete slab, the foundation of a former workshop, is located on the southern boundary. There are additional concrete slabs throughout the entire site which are likely to be associated with the foundations of the former Tram Depot and Naval Depot buildings (see Figure 4).

The foundation to the south of the former Traffic Office was the Amenities Building. A series of underground storage tanks were reportedly located to the west of this building.

The Leichhardt Tram Depot site is zoned special uses under the Leichhardt Council Local Environmental Plan 2000.

<sup>3</sup> Adapted from:- Heritage & Archaeology. November 2004. Former Leichhardt Tram Depot heritage assessment. P6. [Base image NSW Land Information Centre]



Figure 4: Location of elements within the site (Green - Heritage Buildings, Purple - concrete slabs, Pink - tram lines)<sup>4</sup>

<sup>4</sup> Adapted from:- Heritage & Archaeology. June 2005. The former Leichhardt Tram Depot - archaeological assessment and excavation permit application. P12.

## 2

## PROPOSED ACTIVITY

Detailed investigations previously undertaken at the site have identified elevated concentrations of hydrocarbons and phenols in both the soil and groundwater across the site and selected offsite locations. Based on the previous findings and in accordance with Section 60 of the *Contaminated Land Management Act 1997* (CLM Act), the Environment Protection Authority (now the Department of Environment and Conservation (DEC)) declared the StateRail site as having a 'Significant Risk of Harm'. Consequently, DEC declared the site a 'Remediation Site' under Section 21 of the CLM Act. Consequently, under Section 26 of the Act, the landowner - StateRail - has been required to enter into a Voluntary Remediation Agreement (VRA) with DEC to remediate the identified contamination to remove the significant risk of harm from the site.

A Remediation Action Plan (RAP) - attached as **Appendix 2** - has been prepared for the site to identify suitable remediation strategies to address soil and groundwater contamination. The overall objective of the remedial works is to enable recreational open space and commercial/industrial land use on the DET and State Transit Authority land respectively site. It is proposed that a playing field be established for Leichhardt High School in the eastern half of the site. The RAP has been reviewed and approved by a NSW EPA accredited site auditor (Ian Gregson, from GHD) and forms part of the VRA.

In addition to the StateRail site, Moore Street West (currently an active roadway linking Balmain and Derbyshire Roads) will be resumed as part of the project. This site will also require partial remediation.

Most of the site, once remediated, will be developed and used as a playing field associated with Leichhardt High School. The ultimate use of the remainder of the site is unknown at this stage; however development consent will be acquired for any such use.

### 2.1 Contamination Summary

The following provides a brief summary of the contamination issues. Further detail is provided in Chapter 5 of this report and **Appendix 2**.

As a result of historic land uses of the StateRail site, extensive soil and groundwater contamination is present. The two main sources of this contamination are imported

fill and on-site industrial activity. Contaminated soil exists within areas of fill around the site's edges, including beneath Balmain Road and Moore Street West. The distribution of contaminants in this fill is heterogeneous and includes total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), lead and asbestos.

Groundwater contamination is confined to two main areas and includes TPH, BTEX (benzene, toluene, ethylbenzene and xylene), phenolic compounds and PAHs. This contamination has originated from two source areas including the former USTs located in the NW corner and former drum storage area in the SE corner of the site. The source of contamination is attributed to the presence of residual hydrocarbon contamination in the clay/shale profile extending to a depth of 5-6 metres (NW corner) and 8-9 metres (SW corner).

Contamination in fill beneath Moore Street West includes elevated concentrations of lead and benzo[a]pyrene (B(a)P), although the extent of affected soil is limited.

## 2.2 Remediation Strategy

The proposed remediation will occur in four main stages as described below.

### 2.2.1 Preparatory Works

The following preparatory works will be required:

- Archaeological investigation and removal of relics identified in the *Banksia Heritage (November 2004)* and *Archaeology (June 2005)* reports;
- dilapidation survey of the two Heritage-listed buildings and geotechnical investigation of fill in the vicinity of these buildings to inform the excavation design;
- demolition of the weatherboard gatehouse;
- investigative trenching to define the extent of groundwater contamination source areas and assess off-site contaminant migration (this work has already commenced);
- identification and relocation/termination of all services located in or near the excavation areas;
- removal of vegetation and building slabs to expose underlying soil;
- removal of surface accumulations of asbestos fragments from across the site; and
- closure of the Moore Street West roadway.

Accumulated surface water in previously excavated pits onsite will also need to be removed. Previous sampling and analysis of this water as outlined in *URS's report - Phase I & II Environmental Site Assessment of Roadway identified as Moore Street West, Leichhardt, (July 2005)*, indicates that disposal to stormwater would be acceptable provided the suspended solids content is reduced by flocculation. Alternative disposal options include irrigation on-site or disposal to sewer.

Prior to disposal, appropriate licenses will be sought either through Leichhardt Municipal Council or Sydney Water.

### 2.2.2 Source Area Remediation

Sources of groundwater contamination will be excavated and removed. The excavations will be undertaken in three stages:

- Excavation and removal of potentially contaminated fill materials to a depth of approximately 2 metres;
- excavation of clays up to the clay/shale interface (approximately 5 metres depth); and
- excavation of gross contamination within shale bedrock, up to 9metres in the SE corner of the site.

This work will involve deep excavations to depths of between 6 and 9 metres below the ground surface. Excavated materials will either be disposed of off-site or, if acceptable for use as fill, stockpiled on-site for later re-use.

Given the depth of excavation at these two locations and their proximity to nearby roads, specific techniques will need to be adopted to ensure the stability of the excavations. URS (2005) has proposed the use of soldier piles and timber or concrete shoring. This method involves boring and grouting a series of vertical steel piles at about 2 to 3 metre intervals along the excavation boundary adjacent to the roadway. Timber or precast concrete shoring is then gradually inserted horizontally between the piles as excavation progresses. Hughes Trueman (2005) concurred with this excavation approach.

### 2.2.3 Remediation of the Remainder of the Site

Remediation of the remainder of the site will involve excavation of fill materials until clean natural soils are encountered. This activity will involve the following stages:

- Segregation of fill into “clean” and “contaminated” stockpiles;
- validation of the “clean” material for reuse on-site;
- classification of the “contaminated” material for off-site disposal;
- validation and backfilling of the excavations with on-site or imported fill; and
- excavation of clean fill for construction of the playing field.

#### *2.2.4 Reuse and Off-site Disposal*

Preliminary estimations by URS (2005) suggest that between 15,000 m<sup>3</sup> and 18,000 m<sup>3</sup> of contaminated material (fill, soil and rock) will need to be disposed off-site. This material will be disposed at appropriately-licensed landfills in accordance with its waste classification.

## 3 STATUTORY CONTEXT

### *3.1 Part 3A of the Environmental Planning & Assessment Act 1979*

This Environmental Assessment has been prepared to meet the statutory environmental assessment requirements under Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Part 3A has recently been introduced to assist in the assessment process for developments deemed to be Major Projects (formerly State Significant Development). Part 3A removes developments of this type from Part 4 and Part 5 of the Act and introduces a new planning approval process which replaces Statements of Environmental Effects (SEE) and Environmental Impact Statements (EIS) with a *Project Approval* accompanied by an *Environmental Assessment*.

State Environmental Planning Policy (SEPP) - Major Projects, is the State the policy which provides a State wide planning approach to development of Major Projects and development on key sites. Item 28 of Schedule 1 of the SEPP identifies that remediation of land declared as a remediation site under the Contaminated Land Management Act may be development to which Part 3A of the Act applies. StateRail has entered into a Voluntary Remediation Agreement (VRA) with the Department of Environment and Conservation and accordingly, Part 3A applies. Furthermore, the Minister for Planning has formed the opinion that the proposal is a "Major Project" under the SEPP.

Two of the fundamental elements of Environmental Assessment under Part 3A of the EP&A Act are:

1. To allow for integrated approval by removing the need for separate approvals under 9 Acts. This expedites the overall approval process and also ensures an integrated approach; and
2. To promote a level of environmental assessment this is tailored to the level of significance.

This site has a number of heritage and archaeological elements which may be impacted as a result of the proposed activity. Therefore in relation to this Environmental Assessment, Section 75U of the EP&A Act results in separate approval under Part 4, or an excavation permit under section 139 of the *Heritage Act 1977* not being required. It also means that Division 8 of Part 6 of



the *Heritage Act 1977* does not apply to prevent or interfere with the carrying out of an approved project.

Under Section 75F of the EP&A Act, the Director-General of Planning has provided the Environmental Assessment Requirements for this project. These Environmental Assessment Requirements are held at **Appendix 1**. The key assessment requirements identified by the Director-General are:

1. Waste Management;
2. Air Quality;
3. Heritage Impacts; and
4. General Environmental Risks.

Accordingly, to meet the assessment objectives of Part 3A, this Environmental Assessment focuses on these critical issues. Other environmental aspects have also been considered and assessed, however not to the same level of detail.

One of the key elements of an Environmental Assessment required under Part 3A, is that a *Statement of Commitments* is now required from the proponent. This is *Statement of Commitments* is in Section 7 of this Environmental Assessment.

### *3.2 Leichhardt Local Environmental Plan 2000*

The site is zoned "Public Uses" under the provisions of the Leichhardt Local Environmental Plan (LEP). Due to the fact that the proposed remediation is a Major Project under the provisions of the Major Project SEPP, it is permissible with the consent of the Minister for Planning irrespective of land use controls established by the LEP.

Notwithstanding this, the remediation of the site is consistent with the visions of the LEP and the objectives of the zone which are outlined below:

- The vision of the LEP is to "...conserve and enhance the quality and diversity (social and physical) of the natural, living, working and leisure environments of the local government area of Leichhardt. The protection of the amenity of residents should be pre-eminent."; and
- The objective of this zone is to "...facilitate the equitable provision and improve the range, quality and distribution of community and cultural facilities and



services to meet the needs of residents, workers and visitors."

Remediation of heavily contaminated parts of the site will result in significant environmental improvements (through the removal of contaminant sources in ground-water and the site generally) as well as important community and social benefits through the construction of the playing field and the future use of the remainder of the site in an orderly and economic way.

### *3.3 Existing Consent (closure of Moore Street West & construction of a playing field)*

Consent was issued by Leichhardt Council on 10 March 2003 for the "Closure to traffic of Moore Street West and the subsequent construction of a playing field to service Leichhardt High School."

This consent was issued subject to a number of conditions. In addition to a range of general conditions, specific conditions were imposed on this consent relating to a number of aspects including:

- Remediation activities;
- Construction methods;
- Waste Management;
- Soil and water management;
- Erosion and sedimentation;
- Stormwater drainage;
- External road works;
- Landscaping;
- Hazardous materials;
- Traffic management; and
- Environmental protection.

This development consent applies to part of the subject site. To ensure appropriate site management, the control measures proposed in this Environmental Assessment seek to reflect the objectives and requirements of the conditions of this consent.

## 4 CONTAMINATION

### 4.1 Site History

The subject site was either undeveloped or under residential land use until the early 20th century, when the Tram Depot was established in 1913. This use was continued until 1937, when the depot was converted to a workshop and maintenance shed for motor buses. This function was continued until 1958, when the depot was substantially reduced in size.

After 1958, the storage sheds were occupied by the Department of Railways Electrical Branch's Overhead Live Section for use as a maintenance depot. Specific activities included the preparation and treatment of timber power poles and electrical transformer maintenance.

Some of these activities included underground storage tanks (USTs). In 2001, two USTs (located within the NW corner of the site) were removed. Anecdotal information indicates that other USTs may be present onsite. However the presence or locations of other USTs across the site are not known.

Historically, the site has also been extensively filled to bring it to a uniform level. This fill exists in varying thicknesses across the site, with the deepest deposits (up to 2-3 metres) around the edges of the site, particularly in the north-east and south-west corners (see **Appendix 2 Drawing 1**). The fill is predominantly clay, but also contains waste materials including blue metal, demolition rubble, rail ballast, drums as well as coal and tram line remnants - sleepers and tracks.

A number of previous investigations of the study site have been undertaken as follows:

- *Geotechnical and Environmental Assessment - Former State Rail Depot Leichhardt* (Dames and Moore, 1995);
- *Phase I and II Environmental Site Assessment of Roadway Identified as Moore Street West, Leichhardt* (URS Australia, 2001);
- *Phase II Environmental Site Assessment and Additional Groundwater Investigation on StateRail/STA/DET Land, Balmain Road, Leichhardt, NSW* (URS Australia, 2001);
- *Phase III Groundwater Investigation on State Rail/STA/DET Land, Balmain Road, Leichhardt, NSW* (URS Australia, 2001);

- *The Underground Storage Tank Area, State Rail Authority Site, Lot 10, 29 Derbyshire Road, Leichhardt, Remedial Action Plan* (CH2MHill, 2001);
- *Stage 4 Detailed Site Investigation - Soil and Groundwater Assessment* (SKM, 2003);
- *Balmain Road Biopile Remediation Trial, State Rail Authority of NSW, Final Monitoring and Validation Report* (SKM, 2003);
- *Groundwater Investigation, Balmain Road, Leichhardt, NSW* (URS Australia, 2005);
- *Limited Soil Investigation - Areas A and B, Former Tram Depot, Balmain Road, Leichhardt* (MPL Group, 2005); and
- *Remedial Action Plan, Areas A and B of the StateRail Balmain Road Site and Moore Street West, Leichhardt, NSW* (URS Australia, 2005).

The URS Australia (2005) report is the key source document for this report. The report summarises and incorporates the previous investigations.

The SKM (2003) Biopile Remediation Trial was undertaken for StateRail. This trial involved the excavation of three areas containing elevated concentrations of TPH and/or PAHs and treatment using bioremediation techniques. Three active biopiles and one control were established with a supply of water, nutrients and air (oxygen). Monitoring of soil quality and gases was undertaken during the six-month trial to assess bioremediation progress. Following a review of the SKM (2003) reports, URS (2005) concluded that;

- Bioremediation resulted in a general reduction in the concentrations of light fraction TPH;
- there was no measurable reduction in the concentrations of heavy fraction TPH, B(a)P or PAHs during the trials; and
- timeframes are likely to be a limiting factor for remediation using the biopile method are not considered practical for the site.

Two of the three biopiles were decommissioned by SKM following the trial; however the third and the control remain.

## 4.2 Site Assessment and Validation Guidelines

### 4.2.1 Soil Contamination

Currently, the DEC does not endorse any soil remediation guidelines. Rather it has adopted the National Environmental Protection Council's (NEPC) approach, the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPM) which advocates a site-specific risk-based approach.

For this site URS (2005) considered it appropriate to adopt the NEPM health investigation levels (HILs) for open space and commercial industrial land uses for the majority of contaminants with the exception of TPH and BTEX (see Section 3.1 of **Appendix 2**).

Guidelines for TPH and BTEX have been taken from the NSW EPA (1994) *Guidelines for Assessing Service Station Sites*. These guidelines specify threshold levels for sensitive land use, which are considered appropriate for residential development. These levels are therefore conservative when applied to the proposed commercial/industrial and open space land uses proposed for the site.

The applicable regulatory guidelines for the protection of the environment are the NEPM (1999) Interim Ecological Investigation Levels (EILs). These guidelines have been developed for protection of plant species during urban redevelopment and are therefore conservative in this application.

### 4.2.2 Groundwater Contamination

The applicable regulatory guidelines for assessment of water quality are the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000). While these guidelines apply to surface waters rather than groundwater they provide an appropriate basis for undertaking a screening level assessment. As there are no potable groundwater uses in the area, the marine ecosystem protection guidelines have been adopted for the site.

## 4.3 Soil Contamination Distribution

### 4.3.1 Potential Contaminants of Concern

Previous site investigations were undertaken based on the potential contaminants of concern (COCs) associated with the historic activities on site including:

- Placement of fill of unknown origin;
- preparation and treatment of timber power poles;
- storage and maintenance of transformers;
- fuel storage;
- workshop areas; and
- rail and tramline activities.

The URS Australia (2005) investigation (which included a site history review and assessment of previous investigations) identified the following COCs:

- Total petroleum hydrocarbons (TPH);
- polycyclic aromatic hydrocarbons (PAH);
- phenols;
- lead; and
- asbestos.

Previous analytical results for organochlorine pesticides (OCP), organophosphate pesticides (OPP) and polychlorinated biphenyls (PCB) indicated concentrations below laboratory limits, however analysis was limited. Hence, URS (2005) has recommended that further analysis for these contaminants be undertaken during site validation.

### 4.3.2 Distribution of known Contaminants of Concern

Contamination is distributed across the site predominantly within the fill and in the two groundwater contamination source areas (**Appendix 2, Drawing 8**).

The fill, while dominated by clays, is heterogeneous which likely reflects varying origins. Previous site investigations uncovered waste materials with tarry and oily odours in many locations, particularly where the fill thickness is the greatest. Organic chemical contaminants (TPH and PAHs) occur predominantly within:

- The two groundwater contamination source areas;
- thicker filling in the southern part of the site;
- fill beneath Moore Street West and in the north-west corner of the site; and
- soil beneath the Cable Store and Traffic Office buildings.

The main inorganic contaminants present on site are lead and asbestos. Elevated lead concentrations are confined to the eastern section of Areas 3 and 6 (see **Appendix 2, Drawing 8**). Despite an apparent clean-up, asbestos fragments exist across the site surface.

Arsenic, copper, zinc and mercury exist in some locations in concentrations above the ecological investigation levels.

#### *4.4 Groundwater Contamination*

A recent groundwater investigation was undertaken by URS (2005). This investigation indicate that groundwater quality has been impacted by historic land-uses, with elevated concentrations of hydrocarbon compounds - petroleum hydrocarbons, BTEX, phenolic compounds and PAHs. However, the extent of this contamination is limited to two key areas - that is NW corner and SE corner of the site as shown on **Appendix 2, Drawing 8**. URS (2005) also recognized a potential unidentified source of groundwater contamination in the north-eastern corner of the site. URS are currently undertaking investigatory trenching works to confirm the source (if any) of contamination of this area.

Groundwater contaminants exists both in free-phase and dissolved-phase.

A groundwater modelling and a risk assessment were undertaken by URS, during 2005 to assess the potential for offsite migration and risk of harm to down gradient receptors. The findings from this investigation concluded that there was a low risk for continued offsite migration and risk of harm to down gradient receptors.

## 5 EXISTING ENVIRONMENT

### 5.1 *Heritage & Archaeology*

#### 5.1.1 *Site History*

Limited information is available with regards to Aboriginal occupation of the area and particularly the site, though the area appears to have been associated with the coastal Darug language speakers. Nothing is known of Aboriginal occupation following the arrival of the First Fleet, or later when land grants were made and the land became alienated<sup>5</sup>.

European activity was significant in the area from 1788. Initial land grants in this area included a grant to Thomas Biggers in 1796, changing ownership numerous times up until Thomas Field in 1898<sup>6</sup>. During the previous occupation period, Annesley House was built c.1868-1870. This development is the only recorded development on site within the 100 odd years from the initial grant in 1796.

The NSW Government resumed ownership of the site, establishing a new tramway depot in 1913 (the last within the Sydney system). Development included the Tram Sheds at the north-western end of the site, the Cable Store (1913) and Traffic Office<sup>7</sup> (The latter two part of the subject site). It is presumed that the redevelopment of the site brought about the demolition of the Annesley House. Tramway lines were laid in 1914-15 running throughout the site, and circa this time stables and another store were constructed. From construction the depot was used for the storage, servicing and maintenance of the inner western tram group and not as a running depot. This was confirmed in with Schwager Brooks noting that in 1915 it stored 48 motor and 24 rail cars and other trucks and cars<sup>8</sup>.

Trams c.1931 began to decline in popularity and as a result the dual tram line to Leichhardt was reduced to a single line. This depot continued in use until 1937, when the depot was in the most part converted to a workshop and maintenance shed for motor buses as result of the decline in tram popularity. The last tram used the Leichhardt Tram

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5 Heritage & Archaeology. June 2005. The former Leichhardt Tram Depot - archaeological assessment and excavation permit application. P7.

6 Heritage & Archaeology. November 2004. Former Leichhardt Tram Depot heritage assessment. P9.

7 Heritage & Archaeology. June 2005. The former Leichhardt Tram Depot - archaeological assessment and excavation permit application. P8.

8 Ibid. P9.



Depot 1958, ending an era. The site was adapted for future uses including alterations in the tram sheds and removal or covering of rails<sup>9</sup>.

From 1946 until 1984 (when it was decommissioned) the majority of the site was used as a Naval stores depot. The stores themselves covered a large section of the site (see **Appendix 2, Drawing 1**) and rested on concrete pad foundations (extant today).



Figure 5: Aerial of Leichhardt Depot site in 1968<sup>10</sup>

A section of the site was then utilised by the STA bus depot with remainder becoming vacant and consequentially derelict.

After 1958, some of the storage sheds were occupied by the Department of Railways Electrical Branch's Overhead Live Section for use as a maintenance depot. Specific

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<sup>9</sup> Heritage & Archaeology. June 2005. The former Leichhardt Tram Depot - archaeological assessment and excavation permit application. P9.

<sup>10</sup> StateRail Authority



activities included the preparation and treatment of timber power poles and electrical transformer maintenance. Underground storage tanks (USTs) were also associated with this occupation. Two USTs (formerly located in the NW corner of the site) were removed in 2001. It is likely that there are other USTs on the site however their location is not known.

Historically, the site has also been extensively filled to bring it to a uniform level.



Figure 6: Site (1986) after decommissioning of Naval Depot<sup>11</sup>

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<sup>11</sup> StateRail Authority

### 5.1.2 Description of Heritage Items

The Leichhardt Council Local Environmental Plan 2000 highlights that there are heritage buildings present on the site.

Under the *NSW Heritage Act 1977* the State Heritage Inventory is a database maintained by the NSW Heritage Office to collate records of legal heritage instruments. Two buildings within the Leichhardt Tram Depot site are listed on the State Heritage Inventory. They are the Traffic Office and the Cable Store which are outlined in the following table.

SHI Item	Name	Name in this report	LEP Gazette Date	LEP Gazette Number	LEP Gazette Page
1940028	SRA Stores Branch Building	Cable Store	22/12/00	168	13714
1940149	SRA Tram Depot Office	Traffic Office	22/12/00	168	13714

Table 1: Entries of the site in the State Heritage Inventory

These heritage buildings are shown in the following image.



Figure 7: Traffic Office and Cable Store<sup>12</sup>

<sup>12</sup> Heritage & Archaeology. November 2004. Former Leichhardt Tram Depot heritage assessment. P6. [From Schwager Brooks and Partners/Wendy Thorp 1995: figure 2]]

#### 5.1.2.1 Cable Store

As outlined in the *State Heritage Inventory*<sup>13</sup>, the Cable Store is;

- *A large brick structure with stepped brick gable brickwork detail;*
- *rare industrial building in municipality;*
- *associated with Railways and Leichhardt Tram Depot;*
- *and*
- *an item which has integrity values.*



Figure 8: Northern End of the Cable Store<sup>14</sup>



Figure 8: Interior of the Cable Store showing Gantry and upper and lower storage levels<sup>15</sup>

<sup>13</sup> NSW Heritage Database. <http://www.heritage.nsw.gov.au/>

<sup>14</sup> D Gojak/Banksia Heritage & Archaeology. November 2004.

<sup>15</sup> D Gojak/Banksia Heritage & Archaeology. November 2004.

#### 5.1.2.2 Traffic Office

As outlined in the *State Heritage Inventory*<sup>16</sup>, the Traffic Office is;

- *Associated with Railway Station Design;*
- *rare Type if architectural statement in Leichhardt and part of Leichhardt;*
- *single Storey brick structure with bracketed roof overhand and central gable roof over entrance way c.1915; and*
- *inter War Period Design.*



Figure 10: Verandah of Traffic Office with iron supporting brackets<sup>17</sup>

<sup>16</sup> NSW Heritage Database. <http://www.heritage.nsw.gov.au/>

<sup>17</sup> D Gojak/Banksia Heritage & Archaeology. November 2004.





Figure 11: Northern façade of the Traffic Office Building<sup>18</sup>



Figure 12: Traffic Office and Overgrown Site<sup>19</sup>

<sup>18</sup> D Gojak/Banksia Heritage & Archaeology. November 2004.

<sup>19</sup> Ibid

The key archaeological element identified by the detailed Banksia Heritage & Archaeology report; *The former Leichhardt Tram Depot - Archaeological assessment and excavation permit application* (June 2005), was evidence of *in situ* tram tracks. These were found during the testing of contaminated fill. The two parallel rails which are attached to a wooden sleeper, run parallel to the north of the large concrete platform. The line is set into a cut in the natural bedrock profile; in a trench about 5 metres wide, and the rail top is about 0.8 metres below the surface of the platform. The stratigraphy revealed in the cut indicated that the tram line has been covered with a layer of asphalt surfacing, and subsequent dumped fill.

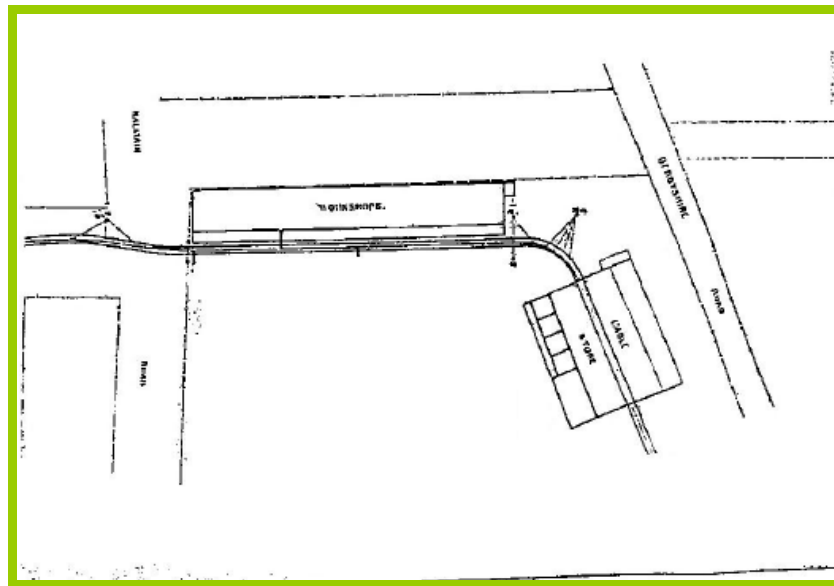


Figure 10: Stratigraphy section of cut in bedrock for the tram line<sup>21</sup>

21 Ibid.



Figure 11: Tram rail and partial sleepers on right with layers of later asphalt and fill<sup>22</sup>



Figure 12: Tram rail and partial sleeper<sup>23</sup>

<sup>22</sup> D Gojak/ Banksia Heritage and Archaeology. November 2004.

<sup>23</sup> Ibid

## 5.1.4 Archaeological Significance

### 5.1.4.1 Assessment of Archaeological Criteria

The following assessment of archaeological significance of the Leichhardt Tram Depot is taken from the *Former Leichhardt Tram Depot archaeological assessment and excavation permit application* document, prepared by Banksia Heritage & Archaeology in November 2004.

*a. an item important in the course, or pattern, of NSW's cultural or natural history*

"The only theme that the potential archaeological resource can demonstrate is the Tram Depot period and because the resource is compromised this only has only moderate ability to demonstrate the theme at a local level"<sup>24</sup>

*b. an item that has strong or special association with the life works of a person, or group of persons, of importance in NSW's cultural or natural history*

"There is no evidence that there is a special association between any individual or group and the site, let alone the potential archaeological resource"<sup>25</sup>

*c. an item that is important in demonstrating aesthetic characteristics and/or high degree of creative or technical achievement in NSW*

"The potential archaeological resource does not meet this criterion"<sup>26</sup>

*d. an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons;*

"No systematic community consultation has been done to assess this criterion. The Tram Depot site probably has some recognition and importance to Leichhardt residents because of its contribution to the historical landscape of the suburb. This is not likely to extend to the potential archaeological resource beyond the two standing buildings"<sup>27</sup>

*e. an item that has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;*

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<sup>24</sup> Heritage & Archaeology. June 2005. *Former Leichhardt Tram Depot archaeological assessment and excavation permit application*. P22.

<sup>25</sup> Ibid. p22

<sup>26</sup> Ibid. P23.

<sup>27</sup> Ibid. P23.



"The potential archaeological resource is therefore of low local significance for its ability to tell us about the past and how to provide information. Such information could provide further detail about the Leichhardt Tram Depot site through its Tram Depot phase and later and such information is not likely to be available from other sources. It will however not be of sufficient general applicability to be relevant beyond the level of the specific site or inform our general understanding of the class of tram depots or the local history of Leichhardt. The type of information that can be provided by the potential archaeological resource is general in nature and does not have much potential for further interrogation"<sup>28</sup>

*f. an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;*

"As identified in Section 2.3.3 there were 12 tram depots in Sydney. Parts of some of them continue to survive, with Tempe being considered the most intact, although this is currently proposed for redevelopment. As types of sites they can be considered to be rare and endangered.

The Cable Store and Traffic Office are likely to be individually rare examples of their type. The other buildings, represented by concrete foundations do not meet this criterion. Tram track survives in sections throughout the former network, and is also known from several depots where sections have been buried. It is uncommon rather than rare at a local level"<sup>29</sup>

*g. an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places;*

"The potential archaeological resource demonstrates some aspects of the layout of a tram depot. Because of its condition it does not represent a clear physical representation of an operative tram depot - all but two buildings in the study area [plus one outside] are demolished and a track is only partly represented. It is noted that Leichhardt was a holding area for older trams rather than being an operative commuter tram depot. This limits its ability to meet this criterion beyond a local level."<sup>30</sup>

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28 Heritage & Archaeology. June 2005. Former Leichhardt Tram Depot archaeological assessment and excavation permit application. P27.

29 Ibid. P23.

30 IBID. P24.

### 5.1.5 Heritage Significance

#### 5.1.5.1 Assessment of Heritage Criteria

The following assessment of heritage significance of the Leichhardt Tram Depot is taken from the *Former Leichhardt Tram Depot heritage assessment* document prepared by Banksia Heritage & Archaeology in November 2004.

*a. an item important in the course, or pattern, of NSW's cultural or natural history*

"The tram buildings are historically important because separately and with other buildings at the site [Tram Sheds] they represent the final phase of the Sydney metropolitan tram network. This is important at the local level, as the use and decline of tram services was localised and was generally a gradual process.

This criterion is met at the local level for the representative historical tram use of the building. It is not met at a state level"<sup>31</sup>

*b. an item that has strong or special association with the life works of a person, or group of persons, of importance in NSW's cultural or natural history*

"There are no people associated with the site who are significant either for their role in the community beyond an average level of achievement, nor are there strong associations of the site with a particular individual for a significant stage of their life.

The criterion is not met at local or state level."<sup>32</sup>

*c. an item that is important in demonstrating aesthetic characteristics and/or high degree of creative or technical achievement in NSW*

"The two surviving buildings are representative of tram depot and railway infrastructure design in the early 20th century. They are architecturally assured; well proportioned and designed buildings that demonstrate sense of style consistent with other railway and transport buildings of that period. They are functionally unusual as survivals.

As substantial old buildings using traditional materials seen today they are attractive landmark structures

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31 Heritage & Archaeology. November 2004. *Former Leichhardt Tram Depot heritage assessment*. P17.

32 Ibid. P17.

The buildings meet this criterion at a local level as representative examples of their type. They do not meet the criterion at a state level”<sup>33</sup>

*d. an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons;*

“The depot has an association with the Leichhardt community as a transport depot for nearly a century. To argue that this association is ‘strong or special’ would require further investigation, but is unlikely to meet a stringent application of the criterion.

This criterion is not demonstrated at a local or state level for this site”<sup>34</sup>

*e. an item that has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history;*

“There is unlikely to be surviving Aboriginal archaeological evidence remaining on the site.

There is unlikely to be any evidence of European land use from 1788 until the start of the Tram Depot period, including the evidence of Annesley House/ Bagshot Park, surviving on the site.

There is no indication in previous reports whether there are comprehensive plans for the tram depot surviving from its initial construction, or whether this has been exhaustively researched. Such plans do normally survive for NSW transport sites. If this is not the case then the buildings provide the main source of information about their own construction and design. The demolished buildings that may survive as archaeological remains would similarly provide evidence of the initial and later layouts for the tram depot.

This criterion is met at a local representative level [subject to the absence of plans being confirmed]. It is not met at a state level”<sup>35</sup>

*f. an item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history;*

“Tram depots are no longer part of the NSW landscape and are subject to development pressures that have changed the majority beyond recognition. In that

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33 Heritage & Archaeology. November 2004. Former Leichhardt Tram Depot heritage assessment. P17.

34 Ibid. P18.

35 IBID. P18-19.

context any survival of three related tram buildings with no significant subsequent construction is locally rare. The industrial machinery in the Cable Store is also a rare survival of associated equipment.

This criterion is met at the local level. It is not met at the state level."<sup>36</sup>

*g. an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places;*

"The two buildings within the study area plus the tram sheds elsewhere on the site were the three major buildings that defined the operation of the tram depot. Although the function of a tram storage depot is not the same as an operational depot they do show the spatial arrangement of the depot and key functions.

This criterion is met at the local level as a representative tram depot. It is not met at a state level."<sup>37</sup>

### **5.1.6 Statement of Heritage Significance**

A comprehensive statement of heritage significance was taken from the *Former Leichhardt Tram Depot heritage assessment* document prepared by Banksia Heritage & Archaeology in November 2004. The content within the statement is still relevant in outlining the significance of the Leichhardt Tram Depot. This statement of heritage significance in its entirety is outlined below<sup>38</sup>.

*The most important aspect of the Cable Store and Traffic Office's local significance is their individual form, which reflects an assured application of early 20th century tranplaying design style to two functionally specific buildings. Their intactness and condition is good, although compromised, and contributes towards their significance [Criterion C]. They remain aesthetically pleasing landmark buildings. The elements that contribute to their external form are the building envelope, use of traditional building materials,*

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36 Heritage & Archaeology. November 2004. Former Leichhardt Tram Depot heritage assessment. P19.

37 IBID. P20.

38 ibid. p20

*They are significant along with the Tram Shed in another part of the site for demonstrating the principal characteristics of this former tram depot [Criterion G] which is becoming rare within Sydney [Criterion F]. As a group of three related buildings they are important in demonstrating how the tram station was laid out.*

*Of lesser significance, but still meeting the threshold for local significance, is their historical association with tramway use and tranplaying history in the local area [Criterion A]. The land's former inclusion in Bagshot Park is not of local significance. If it can -be demonstrated that records and plans of the tram depot's construction do not survive then the archaeological evidence of the former tram depot, consisting of concrete slabs and rail lines as well as buried infrastructure, may be of local significance for its ability to extend our knowledge of the site's layout [Criterion E].*

*There is no evidence of any special or strong association of the site with any community, nor with any significant individual [Criterion B, 0].*

*There is no likely survival of Aboriginal archaeological evidence on the site. Evidence of post tram depot use, including the bus depot and naval stores is of less than the local significance threshold.*

## 5.2 Flora and Fauna

A flora and fauna investigation of the study site and the STA Bus Depot was undertaken by Kevin Mills and Associates (2002), following previous work by Greening Australia (2000). This report is attached as **Appendix 6**.

### 5.2.1 Flora

The site was probably once covered by Sydney Turpentine - Ironbark Forest, a community now classified as endangered under the *Threatened Species Conservation Act*. However today, nothing remains of the original native vegetation; introduced plant species now dominate the site.

The vegetation found adjacent to buildings and fences at the southern and western perimeters of the site comprise a mixture of indigenous native, non-indigenous native and introduced trees and shrubs, that are believed to have been either planted, self-sown from seed imported with fill, or dispersed by birds, wind or dumping of garden waste.

Indigenous native species present on site include Sickle Wattle (*Acacia falcata*), Golden Wattle (*Acacia longifolia*), Couch Grass (*Cynodon dactylon*), Native Sarsparilla (*Hardenbergia violacea*) and Sweet Pittosporum (*Pittosporum undulatum*).

Non-indigenous native tree specimens include Grey Gum (*Eucalyptus punctata*), Swamp Oak (*Casuarina glauca*), River Oak (*Casuarina cunninghamiana*) and Parramatta Green Wattle (*Acacia parramattensis*).

Introduced species include Camphor Laurel (*Cinnamomum camphora*), Hackberry (*Celtis sinensis*), Brush Box (*Lophostemon confertus*), Cotoneaster (*Cotoneaster* sp.), Crofton Weed (*Ageratina adenophora*), Moth Vine (*Araujia hortorum*) and Morning Glory (*Ipomoea purpurea*). Many of these species are either noxious or environmental weeds.

A full species list is provided in **Appendix 6**.

### 5.2.2 Fauna

Fauna species abundance and diversity on the site was found to be low, due to the lack of available habitat. Species identified by Kevin Mills and Associates (2002) included 15 bird species (11 native), two native reptiles (Delicate Skink and Fence Skink) and one introduced mammal (Feral Cat). No native mammals were recorded and none are expected to occur on-site aside from the occasional visit by bats.

Native bird species recorded on site included Australian Raven (*Corvus coronoides*), Australian White Ibis (*Threskiornis molucca*), Noisy Miner (*Manorina melanocephala*), Pied Currawong (*Strepera graculina*) and Silver Gull (*Larus novaehollandiae*).

A full species list is provided in **Appendix 6**.

### 5.2.3 Species of Conservation Significance

#### 5.2.3.1 Threatened Flora

The only threatened plant species (as listed in the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) recorded in the Leichhardt local government area is *Tetratheca juncea* - a low-growing shrub. This species was not identified

during the site survey and would not occur given that it is confined to habitats underlain by sandy soils.

Kevin Mills and Associates (2002) concluded that there were no threatened plant species on the site.

#### **5.2.3.2 Threatened Fauna**

Threatened fauna are also listed under the TSC Act and EPBC Act. Records of threatened fauna species from the Leichhardt LGA include the Grey-headed Flying-fox (*Pteropus poliocephalus*) and the Large Bentwing Bat (*Miniopterus schreibersii*). Neither of these species were recorded during the Kevin Mills and Associates (2002) survey, however they are likely to occur on the site from time to time as habitat is available for foraging and roosting.

#### **5.2.3.3 Endangered Populations and Ecological Communities**

No endangered populations or ecological communities, under the TSC Act, have been declared or exist on this site.

## 6

# IMPACT ASSESSMENT

The following sections outline the likely environmental impacts from the proposed activity and associated control measures.

Prior to any works commencing on-site, the remediation contractor will be required to produce a site management plan detailing environmental, safety and materials management strategies to the satisfaction of Leichhardt Council. The SMP will also detail the specific monitoring procedures for each aspect of the works.

In preparing the SMP, the contractor will adhere to the requirements of the Leichhardt Council Development Approval dated 10 March 2003.

### *6.1 Traffic*

#### *6.1.1 Potential Impacts*

The remediation activities are going to be undertaken at the same time as the construction of the school playing field and the closure of Moore Street West. No fill is proposed to be imported to the site for the construction of the playing field.

The contractor will be required to excavate the contaminated areas, validate the soils and retain validated soils onsite for the construction of the playing field. Only soils which cannot be validated and retained onsite will be removed for off-site disposal. Because the exact volumes of soils which will need to be removed from the site will not be known until work commences, the precise number of vehicle movements will not be known until that time.

The remediation works may require the partial closure of Balmain Road and Derbyshire Road, however these changes will be managed through the range of traffic related conditions imposed as part of Council's existing consent. Accordingly, Council and the RTA (for any impacts associated with Balmain Road) will be consulted and will need to issue appropriate approvals for traffic management.

Relevant impacts and control measures associated with air quality and noise are covered by Sections 6.3 and 6.8 of this Environmental Assessment.



### 6.1.2 Control measures

The contractor undertaking the remediation works, constructing the playing field and closing Moore Street West will need to satisfy a number of conditions imposed by Leichhardt Council on the approval for the playing field and road closure.

Condition 31 of Council's development consent requires that a traffic control plan (in accordance with AS1742.3) be prepared and approved by Council's Manager of Traffic. This condition also requires that a minimum of seven (7) days notice be given to residents if access by residents will be affected and that a copy of the letter to residents and a list of addressees notified be submitted to the Manager of Traffic for approval.

This Traffic Control Plan prepared as a sub-plan of the Remediation Contractors SMP will include details of vehicle movements within, to and from the Site. The Traffic Plan will include assessment of the impacts due to the existing off-site vehicle movements, including buses entering and exiting the bus depot, and community, including the school.

The following operational protocols will be followed:

- Trucks will observe nominated haulage routes (as determined by Council);
- all vehicles will enter and exit the Site via the nominated entry/exit points (as determined by council and/or StateRail);
- trucks will utilise State Roads and minimise use of local roads;
- all drivers are to be issued with maps and directions showing nominated and excluded haulage zones;
- all parking of vehicles associated with the works will be within the Site;
- all trucks will be required to comply with all road traffic rules;
- trucks will not be left full overnight;
- all trucks leaving the Site will pass through a truck wash bay, if soil material is noted to be adhering to the wheels or undercarriage. Trucks will be thoroughly cleaned using water jets, brooms, and the like, to ensure that no material is on the truck exterior which could be deposited off-site;
- all trucks will exit the Site in a forward direction; and

- operating practices for haulage shall include a standard procedure requiring the secure covering of all loads.

## 6.2 Waste Management

### 6.2.1 Potential Impacts

A proportion of the excavated material will need to be disposed of off-site. Contaminated material will be initially segregated on-site based on visual and olfactory assessment. This "waste" will then be classified in accordance with the DEC's *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes* (2004).

In addition to contaminated wastes, there will be various other materials present within the fill including blue metal, building waste, railway sleepers and tram lines. While the majority of this material is likely to require disposal, reuse on-site or recycling will be considered as a first option.

### 6.2.2 Control Measures

The remediation contractor will prepare a Waste Management sub-plan in accordance with the requirements of Leichhardt Council's DCP 38 and the *Waste Planning Guide for Development Applications (Planning for Less Waste)*.

The Waste Management Plan will incorporate the following control measures:

- Identification (via a plan) of on-site material storage areas;
- segregation and control of waste materials in dedicated areas;
- assessment of waste in accordance with DEC guidelines;
- transporting of waste by appropriately-licensed contractors;
- waste tracking in accordance with DEC requirements; and
- asbestos removal in accordance with the requirements of WorkCover NSW, DEC and the National Occupation Health and Safety Commission's *"Code of Practice for the Safe Removal of Asbestos"*.

## 6.3 Air Quality

### 6.3.1 Odour and Fugitive Emissions

Contaminated materials have the potential to produce odours on exposure. The particular contaminants present on-site (eg. hydrocarbon compounds) do have the potential to produce odours that may impact on surrounding receivers. However, the expected concentrations of contaminants within the soil and groundwater are unlikely to produce significant odours.

Fugitive emissions may also arise from operation of plant on-site and moving to and from site.

### 6.3.2 Dust

The proposed remediation activities will involve extensive excavations; spoil handling and transport of material from site. All these activities have a high potential to produce dust, particularly during unfavourable weather conditions (windy and dry). The main activities that are likely to produce dust include:

- Excavation and stockpiling;
- Spoil loading; and
- Vehicle movements across the site (trucks and other vehicles).

### 6.3.3 Control Measures

The remediation contractor will prepare an Air Quality Management sub-plan as part of the SMP/EMP incorporating the following odour, fugitive emission and dust control measures:

- Application of odour and volatile suppressing agents to exposed surfaces/stockpiles as required;
- odour monitoring at the site boundary and at off-site locations;
- regular maintenance of equipment to minimise exhaust emissions;
- staged removal of surface cover to minimise exposed areas;
- limiting the extent of excavations and stockpiles at any one time;
- covering stockpiles if inactive for greater than 2 hours;
- provision of dedicated haul routes (ideally on hard stand areas);

- imposition of vehicle speed limits and mandatory covering of all loads;
- watering of active work areas, particularly during dry and windy conditions;
- regular sweeping of haul routes to remove any accumulated material;
- restrictions on certain activities (eg. stockpiling, soil loading) during adverse weather conditions; and
- stabilisation of disturbed areas as soon as practicable.

## 6.4 *Soil and Water Management*

### 6.4.1 *Potential Impacts*

Soil and water management will be a key environmental management requirement given the extensive earthworks involved with the remediation. The site activities will be carefully planned and staged to ensure that the exposure to this risk is minimised.

Potential risks to the environment resulting from the proposed activities include:

- Pollution of surface waters from sediment and associated contaminants;
- pollution of surface waters from on-site contaminated surface and groundwaters;
- inadvertent contamination of “clean” areas due to inappropriate handling of contaminated material;
- chemical/fuel spills from operating plant; and
- waste spills during transport from the site to disposal facilities.

### 6.4.2 *Control Measures*

The remediation contractor will prepare a Soil and Water Management sub-plan incorporating the following mitigation measures:

- Establishment of a site erosion and sediment control plan in accordance with the requirements of the “*Pollution Control Manual for Urban Stormwater*”. This will include defining the excavation areas and designating the stockpile locations and sediment control measures;

- dedicated stockpile areas for both clean and contaminated materials;
- retention and disposal of run-off from contaminated soil stockpiles;
- installation of clean-water diversions around excavated areas and stockpiles;
- construction of sediment control ponds, if required;
- covering or stabilising stockpiles when not active for more than 24 hours;
- planning works to minimise the disturbed area at any one time;
- conservation of topsoil for future use on-site;
- progressive rehabilitation and stabilisation of the site;
- regular inspections and maintenance of erosion and sediment control measures, including immediately after rain events;
- regular sweeping of truck haul routes to prevent sediment tracking off-site; and
- provision of a truck wheel wash, if necessary, to decontaminate vehicles prior to leaving site.

## 6.5 *Archaeology*

### 6.5.1 *Potential Impacts*

The potential archaeological resource has been assessed as being of low local heritage significance. Notwithstanding this assessment, there is some potential for minor impacts on the intact sections of the tram line and the remains of the original tram building.

### 6.5.2 *Control Measures*

Any remediation on the site has the potential to impact extant archaeology. The impact can be reduced in the following ways, as identified by Banksia Heritage & Archaeology:

1. The SMP will include a strategy of monitoring and recording archaeological remains;
2. The intact sections of the tram line are to be removed for re-use and interpretation. There is interest from tram enthusiasts in accessing the line and it may be possible to recover sufficient in reasonable condition to permit selective reuse on the

site, to enhance interpretation in later development, and to provide sections for current tram activities elsewhere.

3. It is possible that remains of the former tram depot buildings may survive among the building demolition rubble on site. These remains have been identified as being of potential local significance.

Taken together these steps would mitigate the loss of archaeological information potential of the site.

## *6.6 Heritage*

### *6.6.1 Potential Impacts*

A series of investigations have identified the presence of contamination within the site as a result of past land uses and activities. Both the soil and groundwater beneath the site are contaminated at concentrations exceeding the NSW EPA criteria. The contamination has been identified in areas located in the immediate vicinity of the Cable Store and Traffic Office [ie <2m from the building edge], with contamination potentially also located immediately beneath these buildings.

Remediation works in the vicinity and beneath the building structures was presented as a requirement to ensure that there are no immediate risks to human health and/or the environment. The Banksia Heritage & Archaeology report (June 2005) indicated that impacts may be created if remediation under the building was required. The proposed activity and remediation methods do not involve this. Therefore this potential impact no longer exists.

### *6.6.2 Control Measures*

The remediation works will not affect or significantly impact on the heritage values of the site provided that the following measures are adopted as part of operational plans. These need to be integrated into any development application and remediation action plans.

Vibration control measures will include selection of excavation techniques to ensure vibration levels do not exceed 3-5 mm/sec ppv near the footings of heritage buildings. This may include the use of rock saws and milling heads, which generate lower vibration levels than other equipment (eg. rockbreakers)



1. Erect a visible barrier set back 5 metres from the walls of the Cable Store and Traffic Office buildings;
2. Exclude workers and vehicles from inside the barricaded areas;
3. Induct workers about the heritage values of the buildings on site prior to work commencing;
4. Investigate the survival of plans and documentation for the construction of the tram depot buildings.

## 6.7 *Flora and Fauna*

### 6.7.1 *Potential Impacts*

The proposed remediation works will require the removal of some vegetation from the site. This impact is not considered to be significant as the conservation importance of the vegetation on the site is very low and few native animals occur there. Some mature trees, both native and introduced species, exist on site and these should be retained where possible.

### 6.7.2 *Threatened Species Conservation Act*

The *Threatened Species Conservation Act 1995* requires that the following matters be taken into account when considering whether a proposal is likely to have a significant effect on threatened species, populations or ecological communities, and whether a Species Impact Statement (SIS) is required. This process, commonly referred to as the "*eight part test*", was applied below to the proposal to carry out remediation works and develop the subject land.

*(a) In the case of threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction*

No. No threatened species are known to occur on the land and the Grey-headed Flying-fox and the Large Bentwing-bat are the only ones that are likely to occur there. Remediation and development of the site are not, however, likely to disrupt the life cycle of these species (if they occur on the site) to the extent that viable local populations would be placed at risk of extinction. The amount of potential feeding habitat for these species on the site is minute compared to the vast areas of similar habitat throughout the Sydney region.

*(b) In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised*

No. No endangered populations have been declared on the site.

*(c) In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed*

No. The site is not known to contain "significant habitat" for any threatened species, population or ecological community.

*(d) Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community*

No. There is no "known habitat" on the site for threatened species, populations or ecological communities. Regardless, the proposed remediation and subsequent development is not likely to cause currently interconnecting or proximate areas of habitat for any species to become isolated. The habitat on the subject land is also highly disturbed and fragmented.

*(e) Whether critical habitat will be affected*

No. No critical habitat has been declared on this site.

*(f) Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or similar protected areas) in the region*

Not applicable. No threatened species, populations or ecological communities are known to occur on the site.

***(g) Whether the development or activity is of a class of development or activity that is recognised as a threatening process***

A "threatening process" is "a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities". The NSW Scientific Committee has listed the following key threatening processes under Schedule 3 of the Act:

- Alteration to the natural flow regimes of rivers, etc;
- anthropogenic climate change;
- bushrock removal;
- clearing of native vegetation;
- competition and grazing by feral European Rabbit;
- competition from Feral Honey Bees;
- high frequency fire resulting in the disruption of life cycle processes;
- importation of Red Imported Fire Ants;
- invasion of native plant communities by *Chrysanthemoides monilifera*;
- infection by Psittacine Circoviral Disease in Parrots;
- loss and/or degradation of sites used for hill-topping by butterflies;
- predation by *Gambusia holbrooki*;
- predation by the European Red Fox;
- predation by the Feral Cat; and
- predation from the Ship Rat on Lord Howe Island.

Because of the location and physical characteristics of the site, remediation and subsequent development are not expected to result in the promotion of any of the above key threatening processes. Nor is the proposal likely to result in an increase in other recognised threatening processes.

***(h) Whether any threatened species, population or ecological community is at the limit of its known distribution***

No. The range of the Grey-headed Flying-fox and Large Bentwing-bat extends beyond Leichhardt in all directions.

Remediation of the site and subsequent development are not likely to have a significant effect on any threatened species, populations or ecological communities, listed under the *Threatened Species Conservation Act*, or their habitats, so the preparation of a Species Impact Statement is not required.

### 6.7.3 *Environment Protection and Biodiversity Conservation Act*

The Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of “*national environmental significance*”.

The Act identifies six matters of national environmental significance; these are:

1. Declared World Heritage Areas,
2. declared RAMSAR wetlands,
3. listed threatened species and ecological communities,
4. listed migratory species,
5. nuclear actions, and
6. the environment of Commonwealth marine areas.

Actions on or outside Commonwealth land that have, will have or are likely to have a significant impact on the environment on or outside Commonwealth land must also be referred to the Commonwealth Minister for assessment and approval.

No nationally threatened species or ecological communities are known to occur on the subject land, which is owned by the State, not the Commonwealth. None are expected to occur there except, perhaps, the Grey-headed Flying Fox, which is listed as ‘vulnerable’ under the EPBC Act.

A few internationally protected migratory species such as the Masked Lapwing and Wanderer Butterfly (which are common in Australia) may also occur on the site.

The potential for remediation and development of the site to have a significant impact on the Grey-headed Flying-fox and internationally protected migratory species has been assessed by applying the criteria in the Commonwealth

Minister's Administrative Guidelines for Vulnerable Species (Environment Australia, 2000).

#### **6.7.3.1 Vulnerable Species Assessment**

An action has, will have, or is likely to have a significant impact on a vulnerable species if it does, will, or is likely to:

- lead to a long-term decrease in the size of an important population of a species; or
- reduce the area of occupancy of an important population; or
- fragment an existing important population into two or more populations; or
- adversely affect habitat critical to the survival of a species; or
- disrupt the breeding cycle of an important population; or
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; or
- result in invasive species that are harmful a vulnerable species becoming established in the vulnerable species' habitat; or
- interfere substantially with the recovery of the species.

An important population is one that is necessary for a species' long-term survival and recovery.

Remediation and development of the site are not likely to have a significant effect on Grey-headed Flying-foxes, for the site is not likely to support an "important population" of this species. There is no breeding habitat on the site and only a small number of potential foraging trees.

#### **6.7.3.2 Migratory Species Assessment**

An action has, will have, or is likely to have a significant impact on a migratory species if it does, will, or is likely to:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species; or
- result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species; or

- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

- Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; or
- habitat utilised by a migratory species which is at the limit of the species range; or
- habitat within an area where the species is declining.

Remediation and development of the subject land are not likely to modify, destroy or isolate “important habitat” for internationally protected migratory species or disrupt the lifecycle of an ecologically significant proportion of the population. The site does not contain “important habitat” for these species.

Remediation and development of the site are not likely to have a significant effect on any species or communities listed under the EPBC Act. It is therefore not necessary to refer the matter to the Commonwealth Environment Minister for approval.

#### *6.7.4 Control Measures*

The following control measures for flora and fauna will be incorporated within the SMP:

- Retention of existing large trees on the site where possible, regardless of whether they are native or introduced species;
- tree plantings at suitable locations on the site to compensate for the removal of existing trees; and
- landscaping plan should consider selecting tree and shrub species that characterise Sydney Turpentine - Ironbark Forest (the endemic vegetation community of the locality).

### *6.8 Noise and Vibration*

#### *6.8.1 Noise*

The existing noise environment is dominated by noise from local traffic, including movement of buses to and from the STA depot to the north of the site. There are no significant industrial noise sources in the locality.

The proposed activities have the potential to produce noise levels in excess of the existing ambient conditions. Potential noise producing activities include:

- Truck movements, both on-site and when travelling to and from the site;
- rockbreaking, during the removal of existing pavement and concrete remnants from the surface;
- excavation and stockpiling of fill materials on-site;
- spoil loading and handling using excavators and front end loaders; and
- reversing alarms from mobile plant moving around the site.

### 6.8.2 Vibration

Sources of vibration will include rockbreaking and excavation activities. These activities are unlikely to cause discernible impacts at nearby residential receivers; however there is the potential for impacts on the site's heritage buildings - the Cable Store and Traffic Office.

Hughes Trueman (2005) provided recommendations on excavation methods for the site remediation works and the management of vibration near the heritage buildings. A vibration limit of 3-5 millimetres per second peak particle velocity (ppv) was recommended for the building footings.

### 6.8.3 Control Measures

Noise control measures incorporated in the SMP will be developed in accordance with the DEC's *Industrial Noise Policy* (1999) and the *Protection of the Environment Operations Act 1997* and will include the following:

- Restricted construction hours (7.00am to 6.00pm Monday to Friday; 8.00am to 1.00pm Saturday) or as otherwise approved by Council;
- no works on Sundays or Public Holidays;
- L10 noise level (measured over a 15-minute period) not to exceed the background by more than 10 decibels (assuming a construction period of between 4 and 26 weeks);
- construction vehicles to adhere to dedicated haul routes to and from the site;
- no off-site truck queuing;
- respite periods for very noisy activities (eg. rockbreaking); and



- locating continuously operating plant (eg. pumps, generators) away from residential premises and/or providing acoustic screening.

Vibration control measures will include selection of excavation techniques to ensure vibration levels do not exceed 3-5 mm/sec ppv near the footings of heritage buildings. This may include the use of rock saws and milling heads, which generate lower vibration levels than other equipment (eg. rockbreakers).

## 7 STATEMENT OF COMMITMENTS

StateRail proposes *General* and *Specific* commitments. The *General Commitments* detail the commitment made to the community in relation to development of the playing field for Leichhardt High School, remediation of contaminated soil and compliance with development conditions imposed by Council. The *Specific Commitments* detail the environmental impact mitigation measures proposed to be implemented to ensure that *General Commitments* can be delivered with minimal environmental and social impacts.

### 7.1 *General Commitments*

StateRail makes a commitment to

- Remediate the soil within the site area to the requirements of the DEC;
- comply with all conditions imposed by Leichhardt Council and the NSW Department of Planning for approvals applying to the site;
- help facilitate the construction of the playing field for Leichhardt High School; and
- ensure the impacts of remediation are mitigated via the implementation of mitigation measures.

## 7.2 Specific Commitments

Environmental Aspect	Commitment
Traffic	<p>The contractor undertaking the remediation works, constructing the playing field and closing Moore Street West will need to satisfy a number of conditions imposed by Leichhardt Council on the approval for the playing field and road closure.</p> <p>Condition 31 of Council's development consent requires that a traffic control plan (in accordance with AS1742.3) be prepared and approved by Council's Manager of Traffic. This condition also requires that a minimum of seven (7) days notice be given to residents if access by residents will be affected and that a copy of the letter to residents and a list of addressees notified be submitted to the Manager of Traffic for approval.</p> <p>This Traffic Plan prepared as part of the Remediation Contractors SMP will include details of vehicle movements within, to and from the Site. The Traffic Plan will include assessment of the impacts due to the existing off-site vehicle movements, including buses entering and exiting the bus depot, and community, including the school.</p> <p>The following operational protocols will be followed:</p> <ul style="list-style-type: none"> <li>• Trucks will observe nominated haulage routes (as determined by Council);</li> <li>• All vehicles will enter and exit the Site via the nominated entry/exit points (as determined by Council and/or StateRail);</li> <li>• Trucks will utilise State Roads and minimise use of local roads;</li> <li>• All drivers are to be issued with maps and directions showing nominated and excluded haulage zones;</li> <li>• All parking of vehicles associated with the works will be within the Site;</li> <li>• All trucks will be required to comply with all road traffic rules;</li> <li>• Trucks will not be left full overnight;</li> <li>• All trucks leaving the Site will pass through a truck wash bay, if soil material is noted to be adhering to the wheels or undercarriage. Trucks will be thoroughly cleaned using water jets, brooms, and the like, to ensure that no material is on the truck exterior which could be deposited off-site;</li> <li>• All trucks will exit the Site in a forward direction; and</li> </ul>

Environmental Aspect	Commitment
	<ul style="list-style-type: none"> <li>Operating practices for haulage shall include a standard procedure requiring the secure covering of all loads.</li> </ul>
Waste Management - Non-Liquid Waste	<p>The remediation contractor will prepare a Waste Management Plan in accordance with the requirements of Leichhardt Council's DCP 38 and the <i>Waste Planning Guide for Development Applications (Planning for Less Waste)</i>.</p> <p>The Waste Management Plan will incorporate the following control measures:</p> <ul style="list-style-type: none"> <li>Identification (via a plan) of on-site material storage areas;</li> <li>Segregation and control of waste materials in dedicated areas;</li> <li>Assessment of waste in accordance with DEC guidelines;</li> <li>Transporting of waste by appropriately-licensed contractors;</li> <li>Waste tracking in accordance with DEC requirements; and</li> <li>Asbestos removal in accordance with the requirements of WorkCover NSW, DEC and the National Occupation Health and Safety Commission's "<i>Code of Practice for the Safe Removal of Asbestos</i>".</li> </ul>
Air Quality	<p>The remediation contractor will prepare an Air Quality Management Plan (this will form part of the SMP/EMP) incorporating the following odour, fugitive emission and dust control measures:</p> <ul style="list-style-type: none"> <li>Application of odour and volatile suppressing agents to exposed surfaces/stockpiles as required;</li> <li>Odour monitoring at the site boundary and at off-site locations;</li> <li>Regular maintenance of equipment to minimise exhaust emissions;</li> <li>Staged removal of surface cover to minimise exposed areas;</li> <li>Limiting the extent of excavations and stockpiles at any one time;</li> <li>Covering stockpiles if inactive for greater than 2 hours;</li> <li>Provision of dedicated haul routes (ideally on hard stand areas);</li> <li>Imposition of vehicle speed limits and mandatory covering of all loads;</li> <li>Watering of active work areas, particularly during dry and windy conditions;</li> <li>Regular sweeping of haul routes to remove any accumulated material;</li> <li>Restrictions on certain activities (eg. stockpiling, soil</li> </ul>

Environmental Aspect	Commitment
	<p>loading) during adverse weather conditions; and</p> <ul style="list-style-type: none"> <li>• Stabilisation of disturbed areas as soon as practicable.</li> </ul>
Soil and Water Management	<p>The remediation contractor will prepare a Soil and Water Management Plan incorporating the following mitigation measures:</p> <ul style="list-style-type: none"> <li>• Establishment of a site erosion and sediment control plan in accordance with the requirements of the <i>"Pollution Control Manual for Urban Stormwater"</i>. This will include defining the excavation areas and designating the stockpile locations and sediment control measures;</li> <li>• Dedicated stockpile areas for both clean and contaminated materials;</li> <li>• Retention and disposal of run-off from contaminated soil stockpiles;</li> <li>• Installation of clean-water diversions around excavated areas and stockpiles;</li> <li>• Construction of sediment control ponds, if required;</li> <li>• Covering or stabilising stockpiles when not active for more than 24 hours;</li> <li>• Planning works to minimise the disturbed area at any one time;</li> <li>• Conservation of topsoil for future use on-site;</li> <li>• Progressive rehabilitation and stabilisation of the site;</li> <li>• Regular inspections and maintenance of erosion and sediment control measures, including immediately after rain events;</li> <li>• Regular sweeping of truck haul routes to prevent sediment tracking off-site; and</li> <li>• Provision of a truck wheel wash, if necessary, to decontaminate vehicles prior to leaving site.</li> </ul>
Archaeology	<p>Any remediation on the site has the potential to impact extant archaeology. The impact can be reduced in the following ways, as identified by Banksia Heritage &amp; Archaeology:</p> <ol style="list-style-type: none"> <li>1. The SMP will include a strategy of monitoring and recording archaeological remains;</li> <li>2. The intact sections of the tram line are to be removed for re-use and interpretation. There is interest from tram enthusiasts in accessing the line and it may be possible to recover sufficient in reasonable condition to permit selective reuse on the site, to enhance interpretation in later development, and to provide sections for current tram activities elsewhere.</li> <li>3. It is possible that remains of the former tram depot buildings may survive among the building demolition rubble on site. These remains have been identified as</li> </ol>

Environmental Aspect	Commitment
	<p>being of potential local significance.</p> <p>Taken together these steps would mitigate the loss of archaeological information potential of the site.</p>
Heritage	<ul style="list-style-type: none"> <li>• Erect a visible barrier set back 5 metres from the walls of the Cable Store and Traffic Office buildings;</li> <li>• Exclude workers and vehicles from inside the barricaded areas;</li> <li>• Induct workers about the heritage values of the buildings on site prior to work commencing;</li> <li>• Investigate the survival of plans and documentation for the construction of the tram depot buildings.</li> </ul>
Flora & Fauna	<p>The following control measures for flora and fauna will be incorporated within the SMP:</p> <ul style="list-style-type: none"> <li>• Retention of existing large trees on the site where possible, regardless of whether they are native or introduced species;</li> <li>• Tree plantings at suitable locations on the site to compensate for the removal of existing trees;</li> <li>• Landscaping plan should consider selecting tree and shrub species that characterise Sydney Turpentine - Ironbark Forest (the endemic vegetation community of the locality).</li> </ul>
Noise & Vibration	<p>Noise control measures incorporated in the SMP will be developed in accordance with the DEC's <i>Industrial Noise Policy</i> (1999) and the <i>Protection of the Environment Operations Act 1997</i> and will include the following:</p> <ul style="list-style-type: none"> <li>• Restricted construction hours (7.00am to 6.00pm Monday to Friday; 8.00am to 1.00pm Saturday) or as otherwise approved by Council;</li> <li>• No works on Sundays or Public Holidays;</li> <li>• L10 noise level (measured over a 15-minute period) not to exceed the background by more than 10 decibels (assuming a construction period of between 4 and 26 weeks);</li> <li>• Construction vehicles to adhere to dedicated haul routes to and from the site;</li> <li>• No off-site truck queuing;</li> <li>• Respite periods for very noisy activities (eg. rockbreaking); and</li> <li>• Locating continuously operating plant (eg. pumps, generators) away from residential premises and/or providing acoustic screening.</li> </ul>

## REFERENCES

ANZECC. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*

Banksia Heritage & Archaeology. 2005. *The former Leichhardt Tram Depot - Archaeological assessment and excavation permit application.*

*Banksia heritage & archaeology. Former Leichhardt tram depot heritage assessment. November 2004*

*Banksia heritage & archaeology. The former Leichhardt tram depot - archaeological assessment and excavation permit application. June 2005.*

Department of Environment Conservation. 2004. *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes.*

*Director general requirements*

Environment Australia. 2000. *Administrative Guidelines for Determining whether an Action has, will have, or is likely to have a Significant Impact on a Matter of National Environmental Significance under the Environmental Protection and Biodiversity Conservation Act 1999.*

Environment Australia. 2000. Commonwealth Minister's Administrative Guidelines for Vulnerable Species.

Greening Australia. 2000. *Flora and Fauna Assessment, State Rail and State Transit Lands, Balmain Road, Leichhardt, NSW.* Report prepared for NSW Department of Public Works and Services.

Hughes Trueman. November 2005. *Excavation for Remediation Works - Balmain Road and Moore Street, Balmain.*

Kevin Mills & Associates. 2002. *Report on Flora and Fauna - State Rail Authority Land, Balmain Road, Leichhardt.*

NSW EPA. 1994. *Guidelines for Assessing Service Station Sites.*

URS Australia. 2001. *Phase I and II Environmental Site Assessment of Roadway Identified as Moore Street West, Leichhardt.*

URS Australia. 2005. *Remedial action plan, areas a and b of the StateRail Balmain road site and Moore street west, Leichhardt, NSW.*