



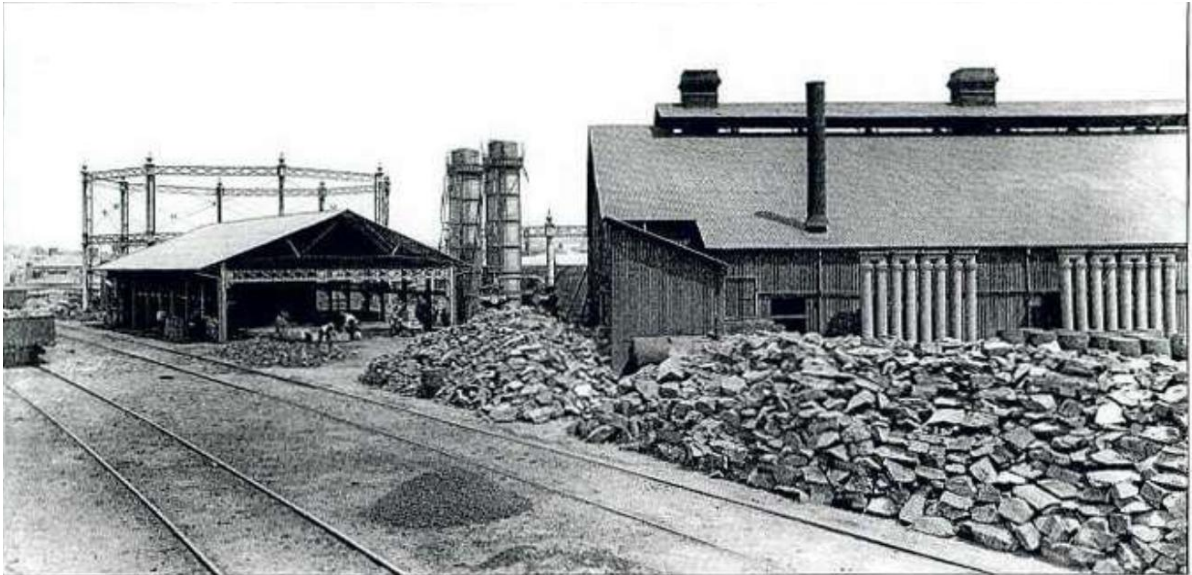
**Planning &
Infrastructure**

***MAJOR PROJECT ASSESSMENT:
Macdonaldtown Gasworks
Remediation Project, Macdonaldtown
(MP 09_0145)***



Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

January 2012



The Gasworks (1917): This view shows the retort house (in the foreground), condensers, washers, purifiers and gasholders (Source: Environmental Assessment, originally from *NSW Railway and Tramway Magazine*, December 1917)

Cover Photograph: Macdonaldtown Site (including southern gasholder), looking north-east.

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EXECUTIVE SUMMARY

Rail Corporation New South Wales (RailCorp) proposes to remediate a vacant triangular parcel of land on Burren Street, Erskineville in the City of Sydney Local Government Area (the Macdonaldtown site). The site is around 7,732m² in area and is currently used for the storage of railway materials.

Between 1892 and 1958, the site was operated as a gasworks which has resulted in contamination of both the soil and groundwater beneath the site. The contaminants include monocyclic aromatic hydrocarbons, polycyclic aromatic hydrocarbons and heavy metals.

In 2000, the EPA determined that there were reasonable grounds to believe that contaminants on-site posed a significant risk of harm to human health and the environment, as defined under Section 9 of the *Contaminated Land Management Act 1997* (CLM Act). The site has been the subject of two Voluntary Investigation Proposals between October 2001 and May 2002, (the terms of which have been satisfied) however, the site has not been formally declared to be a remediation-site under the CLM Act.

RailCorp now proposes to remediate the site by excavation, treatment, reuse and/or disposal of some 23,000m³ of various contaminated materials, including tar impacted soil, fill, clay, gravel sand, tar sludge and demolition material over a 24 month period. The remedial approach involves removal of the source of contamination through the excavation of contaminated materials to the extent practicable and replacement with virgin excavated natural material. Where heritage or geotechnical constraints limit the extent of the material able to be removed, then an in-situ management strategy would be implemented in these areas

Contaminated material would be treated via two methods, bioremediation and cement stabilisation. However, due to the Macdonaldtown site's size restrictions, RailCorp proposes to use an off-site location (the Chullora Railway Workshops and Yard in the Strathfield Local Government Area) as an alternative treatment site. All treatment by bioremediation would be undertaken on-site at Macdonaldtown while all treatment by cement stabilisation would be undertaken off-site, at Chullora. Subsequently, the application includes both the Macdonaldtown and Chullora sites.

Treated material would be tested, classified and transported to a facility licensed to receive the waste, or in the case of the material treated via bioremediation, re-used on-site if possible.

The proposal is classified as a Major Project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it is development within the Redfern-Waterloo Authority Site that has a capital investment value of more than \$5 million. The Project is considered to be a transitional Part 3A Project.

During the exhibition period, the Department received 11 submissions on the project, 8 from public authorities and 3 from the general public. Strathfield City Council initially objected to the Project mainly due to concerns over odour and potential leaching of contaminants at the Chullora site. However, further information provided by the Proponent has satisfied Strathfield Council's concerns and it withdrew its objection. None of the other agency submissions objected to the project, however, the Environment Protection Authority, the Department of Health, the Heritage Council and the NSW Office of Water (NOW) made a number of recommendations. The public submissions raised concerns over the potential noise, odour and health impacts from treating contaminated material at Chullora.

The Department has assessed the merits of the project in accordance with the relevant requirements in the *Environmental Planning and Assessment Act, 1979*, and is satisfied that the impacts of the project are relatively minor and can be mitigated and/or managed to ensure an acceptable level of environmental performance.

The Department is also satisfied that the project would reduce the risk of harm to human health and the environment by removing a long-term contaminant source. Consequently, the Department believes the project is in the public interest and should be approved, subject to stringent conditions.

1. BACKGROUND

1.1 Project background

RailCorp (the Proponent) owns a vacant triangular parcel of land on Burren Street, Erskineville (the site) (see **Figure 1**) in the suburb of Sydney. The site, which is located between Erskineville and Macdonaldtown railway stations, was acquired by the NSW Railways Department in 1888 and operated as a gasworks plant from 1892 to 1958.

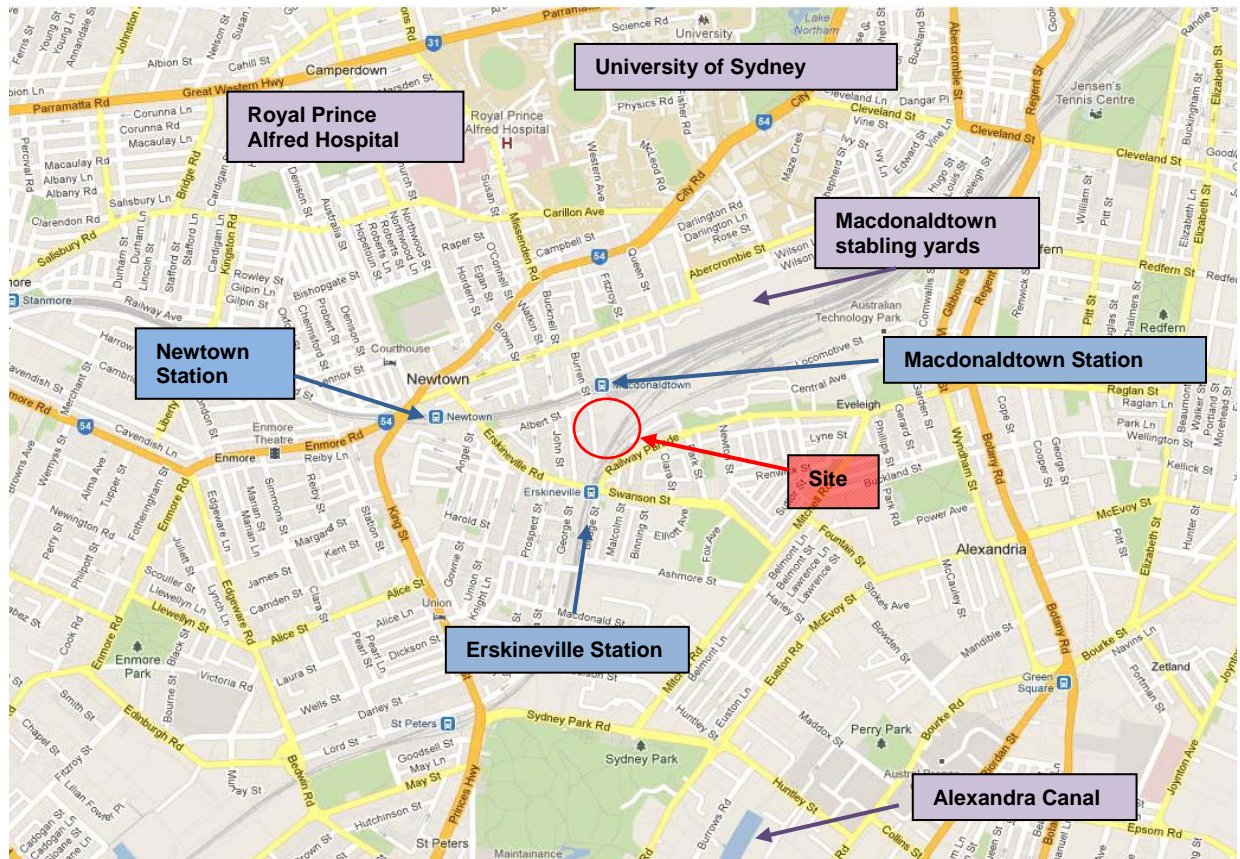


Figure 1: Site location (source: Google Maps)

The gasworks comprised of two separate and complete plants. One for the manufacture of gas from coal for use for lighting at nearby stations and in signals from Sydney to Macdonaldtown; and the other for the manufacture of a much richer gas made from shale for use as lighting in the carriages. Operations included raw product storage, gas production, storage of gas and tar wastes.

When the gasworks ceased production in the 1950s, the site was still used for the storage of gas, which was piped from the gasworks at the Mortlake Central Distribution Plant, until the mid 1970s.

In 2000, RailCorp (formerly the State Rail Authority) commissioned CH2MHill to undertake Phase 1 and 2 Environmental Site Assessments (in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites 1998*) of the Macdonaldtown Triangle as part of investigations for development of the Macdonaldtown Stabling Yards. The assessments identified numerous contaminants associated with the operation of the gasworks, including:

- monocyclic aromatic hydrocarbons (MAH), which include benzene, toluene and ethylbenzene and xylenes (BTEX);
- polycyclic aromatic hydrocarbons (PAH);
- nonhalogenated phenolic compounds;
- heavy metals (in localised fill materials and groundwater); and
- asbestos (in localised fill materials).

Identified sources include the coal tar within the tar wells, underground pipe-work and below ground remnants of the Northern Gasholder, surface ash/coke fill and asbestos contaminated demolition waste.

In June 2000, the State Rail Authority notified the EPA under section 60 of the *Contaminated Land Management Act 1997* (CLM Act) of the contamination within the former gas works site. The EPA subsequently decided that there were reasonable grounds to believe that contaminants on-site pose a significant risk of harm to human health and the environment (as defined under Section 9 of the CLM Act). The site was the subject of two Voluntary Investigation Proposals between October 2001 and May 2002 (the terms of which have been satisfied), however, the site has not been declared to be a remediation site under the CLM Act.

The EPA identified the issues of concern as being benzene in the groundwater and the potential for contaminants to migrate off the site through surface water run-off into Alexandra Canal and through groundwater into neighboring residential properties.

1.2 Project Need

The Macdonaldtown gasworks site is contaminated with materials associated with its former use. In its current form, it has the potential to pose a significant risk of harm to human health and the environment through migration of contaminants off-site via surface water runoff and via contaminated groundwater. Remediation to remove the source of contamination would address on-site impacts as well as preventing continued off-site contaminant migration.

1.3 Remediation options evaluation

Since June 2000, RailCorp has investigated numerous options to remediate the site. The 2007 Remediation Action Plan (RAP) prepared for the site in accordance with the *Contaminated Land Management Act 1997* (and endorsed by a Site Auditor accredited under the CLM Act), identified several soil remediation options. However, a number of identified site constraints led to these options being further refined in JBS Environmental's 2011 *Remedial Strategy*. Based on the range and distribution of contamination present, the assessments concluded that no single remedial method provided a solution that was cost effective, timely and appropriate to the site as a whole. Rather, based on the characteristics of the material encountered, the assessment identified four methods that could be used in combination on the site.

Preferred remediation strategy

The preferred remediation approach involves removal of the source of contamination through the excavation of contaminated materials to the extent practicable and replacement with virgin excavated natural material. By removing the primary contamination source then the contaminants in the groundwater are likely to attenuate over time.

The preferred remediation options as outlined in JBS's Remedial Strategy are designed to address the main contamination issues which are outlined in Table 1 below.

Table 1 – Remediation Strategy

Type of contamination	Approximate Quantity (m ³)	Remediation Solution*
Free Tar (tar sludge)	420	To be sent to a waste treatment facility as hazardous waste where it would be treated for eventual disposal.
Ash and Tar impacted materials	17,105	<ul style="list-style-type: none"> • Bioremediation which would be undertaken onsite, for off-site disposal or on-site reuse – (see explanation below); or • Cement Stabilisation which would be undertaken off-site, for off-site disposal – (see explanation below) <p>These methods would be used to reduce the contaminate concentrations in the soil in order to</p>

Type of contamination	Approximate Quantity (m ³)	Remediation Solution*
		reduce the materials' waste classification enabling appropriate disposal.
Asbestos and other material classified as Restricted solid waste or lower	3,665	Excavation and off-site disposal to a licensed facility.
Impacted water	2,565 (plus any groundwater encountered)	Treatment in an on-site water treatment plant for disposal to sewer or on-site reuse.

*Any contaminated material that remains on-site following excavation would be capped and managed via a Long Term Management Plan.

As presented in the above table, the treatment options for ash and tar impacted material would be via bioremediation or cement stabilisation.

Generally, bioremediation involves the use of microorganisms to degrade organic contaminants either through an oxidative or reductive process. According to the Remedial Strategy, bioremediation is a proven technique used for materials impacted with low levels of volatile and lighter fraction poly aromatic hydrocarbons (such as naphthalene). It is not suitable for inorganic (eg heavy metals) and semi-volatile contaminants and would only be suitable for materials that can be treated in a reasonable timeframe. The material would be treated to reduce the concentration of contaminants in the soil so that it could either be disposed of as Restricted Solid Waste, General Solid Waste or potentially, reused on-site.

Cement stabilisation immobilises contaminants through mixing the contaminated material with calcium or magnesium oxide based cement. Although this method could be used as a complete solution, it would be cost-prohibitive. It would be best suited to material considered unsuitable for treatment by bioremediation or off-site disposal such as material with a waste classification of Hazardous Waste that contains inorganics or would take too long to treat via bioremediation.

Cement stabilisation would need to be undertaken in accordance with the NSW EPA's '*General Immobilisation of Contaminants in Waste – Coal tar Contaminated Waste From Former Gasworks Sites*' approval number 2005/14 (IA 2005/14) or a specific immobilisation approval.

The remediation contractor would ultimately decide which treatment method is to be adopted for a particular batch of soil based on pre-treatment analytical testing of any soils excavated from the Macdonaldtown site and observations made of the material. The chosen treatment method is dependent on contaminant levels, proportion of individual contaminants present and waste classification of the material.

1.4 Site Description

Macdonaldtown site description

The Macdonaldtown Site is a 7,732m² triangular parcel of land located between Erskineville and Macdonaldtown railway stations in the City of Sydney local government area (see **Figure 2**). The site is primarily covered by grass and low lying weeds, with a few shrubs and trees located along its northern and western boundaries as well as some small stockpiles of soil and fill materials. The extent of contamination is shown in **Figure 3**.

The majority of the above ground infrastructure was demolished in 1958 with the exception of the remnants of the southern gasholder, which is located on the western end of the site.

The site is listed on the NSW State Heritage Register (SHR 01140) as part of the Eveleigh Railway Yards, and it is included in the RailCorp S.170 Heritage Register (SRA102) with particular listing for the standing gasholder being the only remnant artefact of its type still standing in New South Wales.

The site is currently used for the storage of railway materials and is surrounded by a 1.8m high chain-wire fence on most boundaries, with the exception of a 20-metre gap on the southern site boundary adjoining the Illawarra Rail Corridor. A concrete noise wall is also located along the southern boundary of the site.

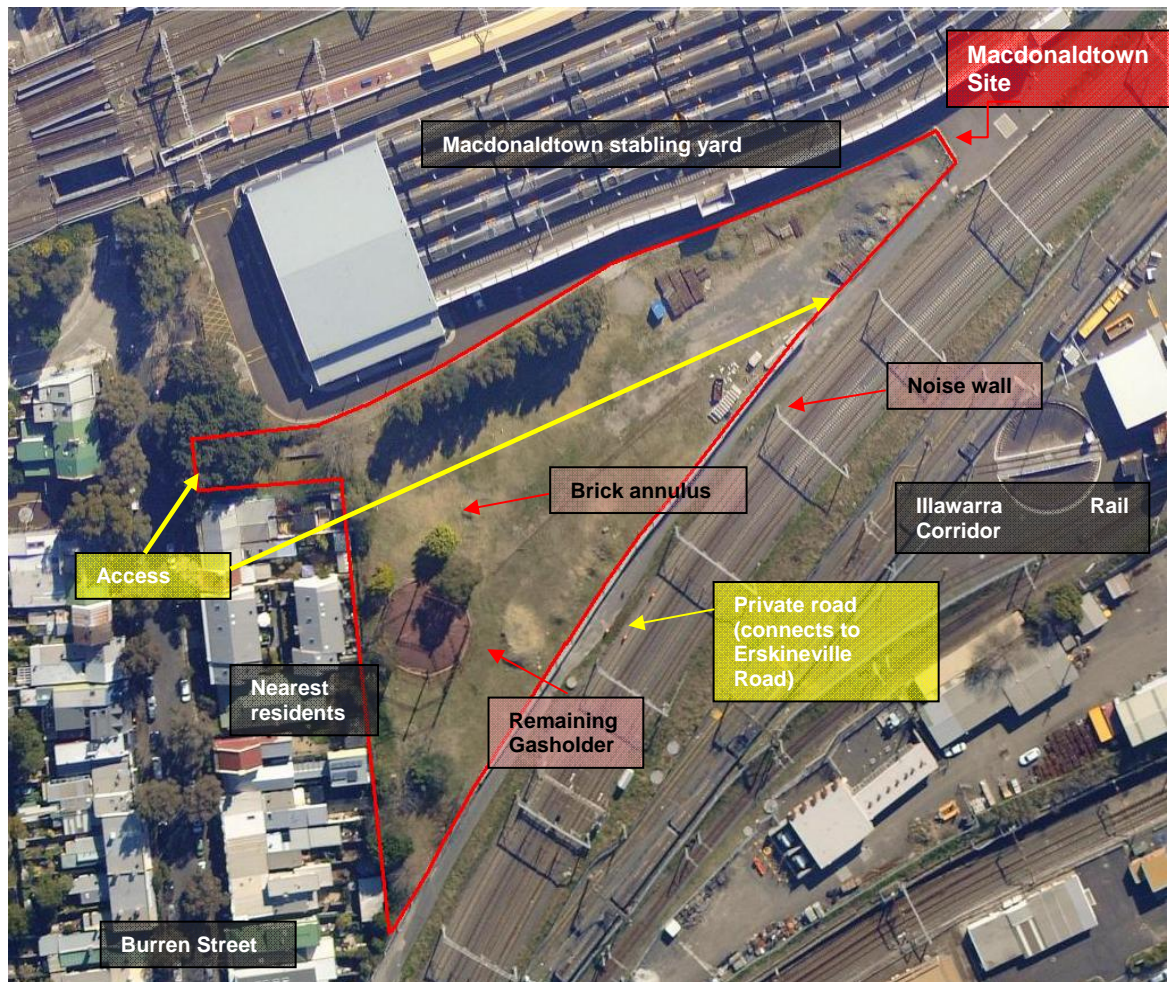


Figure 2: Existing Macdonaldtown site layout (source Near Map 2012)

Other buried structures include a brick annulus of a second gasholder to the north of the standing gasholder, two tar pits and pipework. The site also contains a disused signal hut, and a number of concrete slabs and retaining walls on the northern site boundary. Railway services are also present within a ground level concrete trough on the western embankment and a Sydney Water sewer line is located beneath this same embankment. The site also contains fill materials including bricks, metal pipes, tiles, and fibro-cement sheeting.

The site is bounded to the north by RailCorp's Macdonaldtown Stabling Yard and to the east and south by the Illawarra Rail Line. Residential properties on Burren Street are located immediately adjacent to the western site boundary (see **Figure 2**).

Access to the site is via an existing gated access road which connects the site to Erskineville Road running adjacent and parallel with the East Hills Bankstown/Illawarra railway corridor or via a gate located on Burren Street.

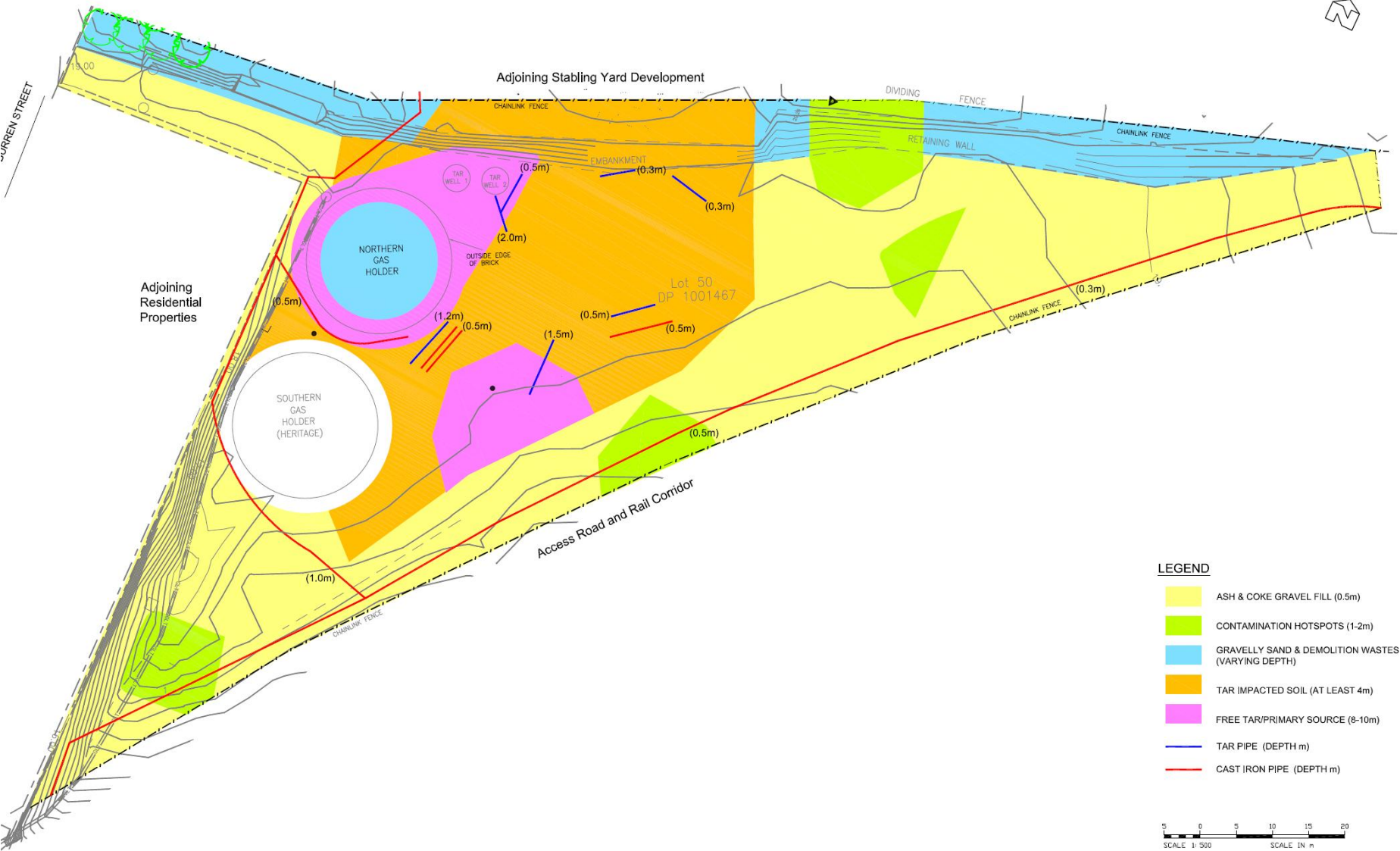


Figure 3: *Extent of Contamination* (source Environmental Assessment

Given the size of the Macdonaldtown site and its proximity to the residential dwellings, an off-site location (the Chullora Railway Workshops and Yards) has been identified as a proposed alternative site for the treatment of contaminated materials by cement stabilisation. **Figure 4** below shows the sites regional context.

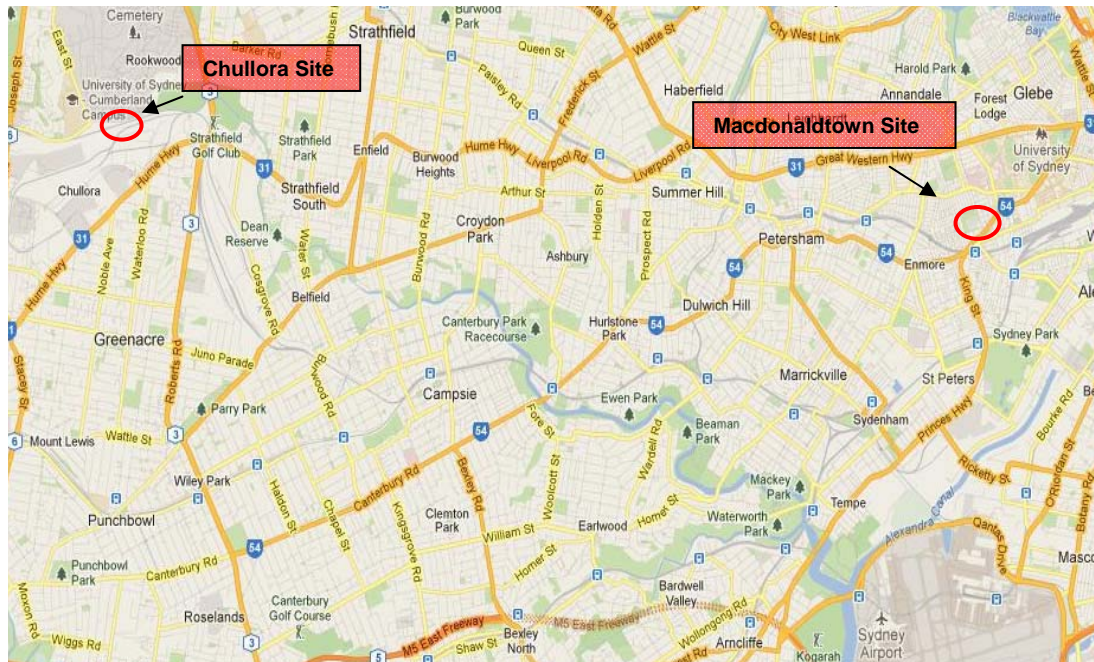


Figure 4: Regional context

Chullora Site Description

The Chullora site is located some 13 kilometres north-west of the Macdonaldtown site. The site is located within the Strathfield LGA in the north-eastern corner of RailCorp's Chullora Railway Workshops and Yards (which straddles both Strathfield LGA and Bankstown LGA). The site is accessed via the Hume Highway and Worth Street and is currently used for the temporary storage of railway materials, including sleepers and rails.

The Chullora Railway Workshops and Yards are approximately 2.3 hectares in area, however, the proposed portion to be used for the project (the site) is around 0.99 ha and located in the Yards' north-eastern corner (see **Figure 5**).

The site is mostly cleared, relatively flat, vacant land. There are a few trees on-site as well as a rail loop and two sheds which may be removed prior to any works commencing.

The nearest residential receivers are located approximately 150m to the east, along Marlene Crescent, and approximately 150m to the south on the other side of the Hume Highway. Strathfield Golf Course is located to the north, across the rail lines, and Chullora rail yards are located to the west (see **Figure 5**).

The contaminated material would be transported to the Chullora site in accordance with relevant requirements associated with the transport of hazardous materials.



Figure 5: Existing Chullora site layout (source Near Map 2012)

2. PROPOSED PROJECT

2.2 Project Description

The Project comprises the excavation, treatment (via bioremediation or cement stabilisation), reuse and/or disposal of some 23,000m³ of various contaminated materials, including tar impacted soil, fill, clay, gravel sand, tar sludge and demolition material.

Bioremediation would be undertaken at the Macdonaldtown site while cement stabilisation would be undertaken at Chullora.

Contaminated material would be excavated in stages across the Macdonaldtown site. Excavation of the largest area of free tar material and heavily impacted soil around the remains of the northern gasholder would be undertaken within a tented enclosure to minimise odour, dust and noise impacts on the adjacent residences. The tented enclosure would remain in place for the treatment of contaminated material via bioremediation. A similar tented enclosure would also be constructed at Chullora for treatment works involving cement stabilisation. All treatment would be undertaken within the purpose built polyvinyl tented enclosures which would be maintained under a constant negative pressure during working hours. Air emissions from the enclosures would be discharged through bag filters to remove particulates and granular activated carbon filters to remove potential malodorous emissions.

Excavation of contaminated material would be completed to the extent practicable. That is, where heritage or geotechnical constraints limit the extent of the material able to be removed, an in-situ management strategy would be implemented in these areas.

The material that is treated by bioremediation may be reused on-site, however, it must comply with the soil validation criteria.

The project layout is shown in **Figures 6** and **7**. The key components of the project are listed in **Table 2** and detailed in the Environmental Assessment (EA) for the Project (see **Appendix A**).

Table 2: Major Components of the Project

Component	Description
Project Summary	<p>The proposal involves the excavation, treatment, reuse and/or disposal of approximately 23,000m³ of various materials, including soil, fill, clay, gravel sand, tar sludge and demolition material.</p> <p>The project would be undertaken in three main stages:</p> <ol style="list-style-type: none"> 1. <u>Pre-remediation</u>: site establishment, clearing, and additional investigations (outlined below); 2. <u>Remediation</u>: excavation, transport of materials to Chullora, treatment, stabilisation, bioremediation, containment and capping, or off-site disposal; and 3. <u>Post-remediation</u>: validation, re-instatement and monitoring.
Macdonaldtown Site	Chullora Site
<p><i>Major Components of the Remedial works</i></p> <p>The remediation process at Macdonaldtown involves:</p> <p><u>Pre-remediation</u></p> <ul style="list-style-type: none"> • Preparation of plans, dilapidation studies, geotechnical and structural assessments. • Site establishment. <p><u>Remediation Stage:</u></p> <ul style="list-style-type: none"> • Pre-treatment of tar sludge and tar impacted soil. • Extraction of tar content from gasworks pipes and impacted water from below-ground infrastructure. • Installation of access road turning circle. • Excavation of 0.5m of fill from the majority of the site for cement stabilisation. • Transportation of material to Chullora. • Commissioning of enclosure, water treatment system and air emission control system. • Excavation, treatment and validation of area within enclosure. • Reinstatement of enclosure with VENM. • Excavation of area around enclosure. • Reinstatement of site with VENM. • Capping and management of any remaining material via a long term management plan. <p><u>Post Remediation</u></p> <ul style="list-style-type: none"> • Site validation. • Groundwater monitoring. • Preparation of Site Audit Statement. 	<p>The remediation process at Chullora involves:</p> <p><u>Pre-remediation</u></p> <ul style="list-style-type: none"> • Baseline study of site • Site establishment. • Installation of temporary enclosure. • Commissioning of air and water treatment systems. • Receive materials for treatment. Onsite stockpiling until minimum treatment volume achieved. <p><u>Remediation</u></p> <ul style="list-style-type: none"> • Material to be treated would be stockpiled outside of the tented enclosure. • Gradual treatment of soils by cement stabilisation within the enclosure. • Transport of treated material to a licensed landfill. <p><u>Post remediation</u></p> <ul style="list-style-type: none"> • Decommissioning. • Post treatment study of site.
Treatment options	<p>Approximately 5,240m³ of material would be suitable for bioremediation on-site at Macdonaldtown</p> <p>All free tar (hazardous waste) would be sent to a licensed waste treatment facility where it would be treated to allow it to be lawfully disposed of at a licensed facility.</p> <p>Approximately 17,520m³ of material would be transported (in accordance with relevant requirements associated with the transport of hazardous materials) for cement stabilisation off-site at Chullora then disposal at a licensed facility.</p>
Groundwater	N/A
	<p>Any perched groundwater drained out of the fill and shallow soil would be treated in the onsite waste water treatment plant prior to off-site discharge.</p> <p>During remediation, monitoring wells would be installed to allow for ongoing groundwater monitoring in accordance with a Site Auditor</p>

Component	Description
	endorsed Groundwater Management Plan.
Stockpiles/exposed tar	Exposed material limited to: <ul style="list-style-type: none"> • 400m² for surface soil excavations; and • 25m² for retaining walls. Exposed coal tar impacted soils restricted to a surface area of 150m ² .
Traffic	A maximum of 65 – 70 truck movements from Macdonaldtown to Chullora per day (equates to 6 – 7 vehicles movements per hour), however, truck activity would only peak for a day or two at a time, when there is enough material stockpiled to be taken to Chullora. It is estimated there would be an average of 20 truck movements per day (over a 6 month excavation period).
Construction/remediation timeframe	Approximately 24 months, this includes approximately: <ul style="list-style-type: none"> • 8 months for pre-remedial works; • 3 months for site-establishment; • 7 months for the excavation works at Macdonaldtown; • up to 7 months validation of excavation; • up to 6 months for the treatment of materials at Chullora by cement stabilisation; • up to 10 months for the treatment of materials at Macdonaldtown by bioremediation; • up to 6 months for reinstatement; and • up to 3 months for post remediation studies and monitoring. <p>Note: a lot of these activities would run concurrently.</p>
Hours of Operation	7am to 6pm Monday to Friday and 8am to 1pm on Saturday. No work would be undertaken on Sundays and Public Holidays.
Capital Cost	Over \$5 million

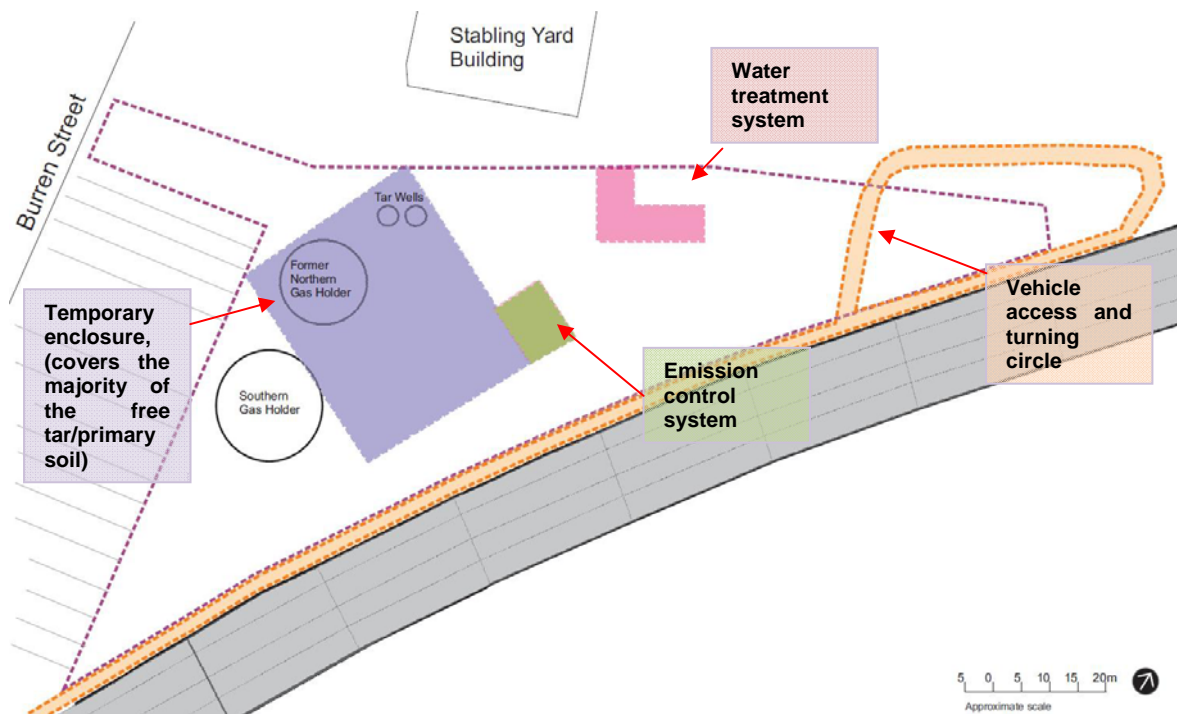


Figure 6: Macdonaldtown site layout (Source: Environmental Assessment)

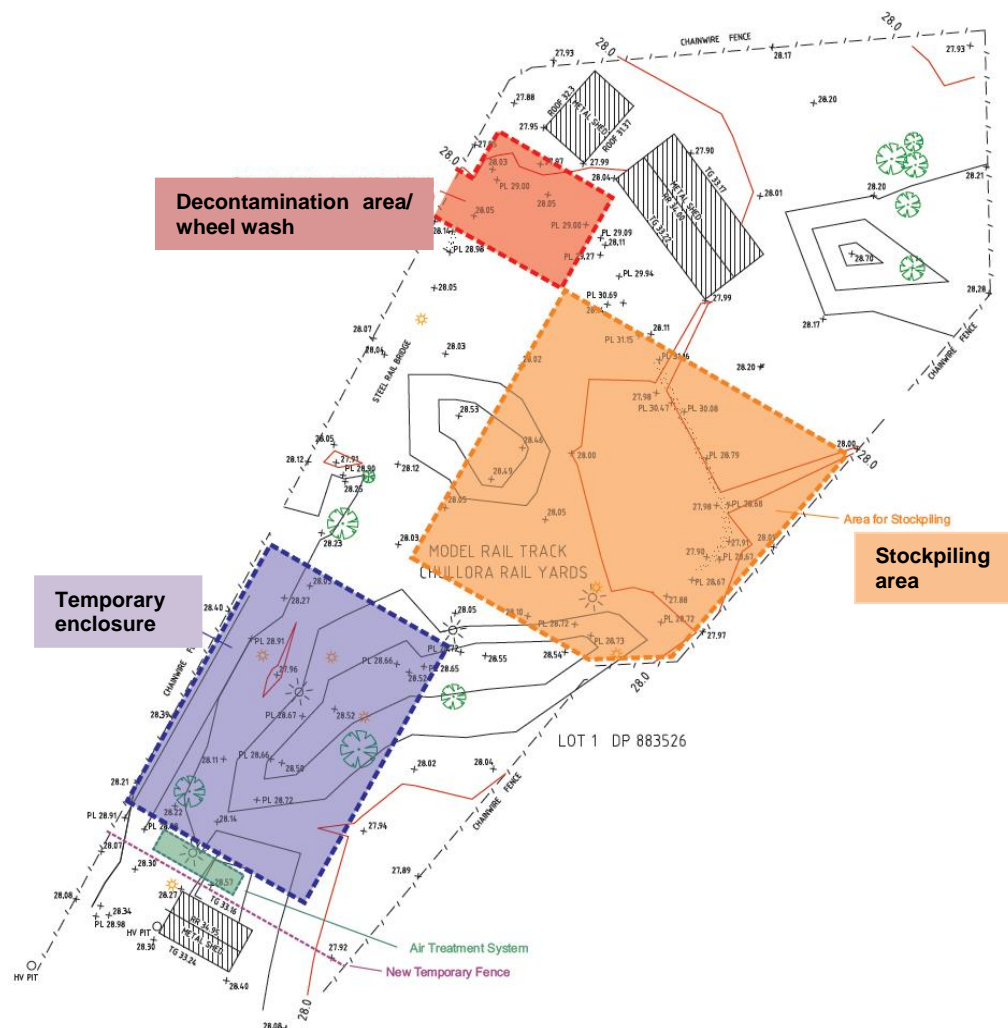


Figure 7: Chullora Site Layout (Source: Environmental Assessment)

3. STATUTORY CONTEXT

3.1 Major Project

The proposal is classified as a Major Project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it is development within the Redfern-Waterloo Authority Sites that has a capital investment value of more than \$5 million.

Part 3A of the EP&A Act, as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A to the Act, continues to apply to transitional Part 3A projects.

Consequently, this report has been prepared in accordance with the requirements of Part 3A and associated regulations, and the Minister (or his delegate) may approve or disapprove of the carrying out of the project under section 75J of the Act.

The Minister has delegated his functions to determine Part 3A applications to the Department where:

- the relevant local council has not made an objection; and
- there are less than 25 public submissions objecting to the proposal; and
- a political disclosure statement has not been made in relation to the application.

There have been 3 submissions received from the public, the relevant Councils (City of Sydney and Strathfield) do not object and no political disclosure statements have been made for this application or for any previous related applications. In addition, there have been no disclosures made by any persons who have lodged an objection to this application.

Accordingly the application is able to be determined by the Director-General under delegation.

3.2 Permissibility

Under Section 75J of the EP&A Act, the Minister or his delegate cannot approve the carrying out of a project that would be wholly prohibited under an environmental planning instrument.

The Macdonaldtown site is zoned Special Purpose Zone, Infrastructure under Schedule 3, Part 5 of the *State Environmental Planning Policy (Major Development) 2005*. Remediation is prohibited on land within the Special Purpose Zone.

However, *State Environmental Planning Policy No. 55 – Remediation of Land* (SEPP 55) stipulates that remediation works are permissible on the land, “despite any provision to the contrary in an environmental planning instrument, except as provided by clause 19(3)”. Clause 19(3) is not relevant in this instance as the proposed remediation works are part of a project that is defined as “category 1 remediation works”. SEPP 55 prevails over the SEPP Major Development, subsequently the proposal is therefore permissible on the Macdonaldtown site.

The Chullora site is zoned Special Uses 5(b) – Railways under the Strathfield Planning Scheme Ordinance 1969, any works are permitted with consent in this zone.

Therefore, the Minister or his delegate may approve the carrying out of the project.

3.3 Other approvals

As the project would not constitute Scheduled Development Work or Scheduled activities under Part 1 of the POEO Act, an EPL is not required for the Macdonaldtown site, however, an EPL would be required for the Chullora site, if it is used to treat more than 1000 m³ of contaminated soil received from off-site. Up to 17,520m³ of contaminated material is proposed to be treated at the Chullora site, as such RaliCorp would require an EPL for the project.

3.4 Environmental Planning Instruments

Under Sections 75I(2)(d) and 75I(2)(e) of the EP&A Act, the Director-General's report for a project is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project, and the provisions of any environmental planning instruments (EPI) that would (except for the application of Part 3A) substantially govern the carrying out of the project and that have been taken into consideration in the assessment of the project.

The Department has considered the project against the relevant provisions of several environmental planning instruments including *State Environmental Planning Policy No. 55 – Remediation of Land*, the *State Environmental Planning Policy (Major Development) 2000*, the *Strathfield Planning Scheme Ordinance 1969* and *State Environmental Planning Policy 33 – Hazard and Offensive Development*.

The Department is satisfied that, subject to the implementation of the recommended conditions of approval, the proposal is generally consistent with the aims and objectives of these instruments (see Appendix D).

3.5 Objects of the EP&A Act

The Minister's consideration and determination of the application must be consistent with the relevant provisions of the EP&A Act, including the objects set out in Section 5 of the Act. The objects of most relevance to the Minister's decision on whether or not to approve this project are those under Section 5(a)(i), (vi) and (vii). They are:

- (a) to encourage:
 - (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
 - (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and

(vii) *ecologically sustainable development.*

The Department has fully considered the objects of the EP&A Act, including the encouragement of ESD, in its assessment of the application. The assessment integrates all significant economic and environmental considerations and seeks to avoid any potential serious or irreversible damage to the environment, based on an assessment of risk-weighted consequences.

The Department is satisfied that the project can be conducted in a manner that is broadly consistent with the objects of the EP&A Act.

3.6 Statement of Compliance

In accordance with Section 75I of the EP&A Act, the Department is satisfied that the Director-General's environmental assessment requirements issued on 27 July 2010 have been complied with.

4. CONSULTATION AND SUBMISSIONS

4.1 Exhibition

Under Section 75H(3) of the EP&A Act, the Director-General is required to make the environmental assessment (EA) of an application publicly available for at least 30 days.

After accepting the EA, the Department:

- made it publicly available from **Thursday 26 April 2012** until **Friday 1 June 2012** (37 days):
 - on the Department's website; and
 - at the Department's information Centre, City of Sydney Council, Bankstown City Council, Strathfield Council, and the Nature Conservation Council.
- notified landholders in the vicinity of the site about the exhibition period by letter;
- notified relevant State and local government authorities in writing; and
- advertised the exhibition in the Central Courier, Canterbury-Bankstown Express and the Inner West Courier

The Department received 11 submissions during the exhibition of the EA, including eight submissions from public authorities and three submissions from the general public.

A summary of the issues raised in submissions is provided below, a copy of each of these submissions can be found in Appendix B.

4.2 Public Authority Submissions

The **EPA** did not object to the proposal, however, it recommended modifications to RailCorp's Draft Statement of Commitments regarding contaminated land, erosion and sediment control, noise and vibration, air emission monitoring and controls. The EPA also recommended that these and a number of other conditions be included in the recommended conditions. The EPA also provided advice on licensing requirements, noting that an Environment Protection Licence may be required for the treatment of contaminated material at Chullora.

The **NSW Office of Water** supported the strategies proposed to monitor groundwater, provided advice regarding licensing and recommended that the Environmental Management Plan (EMP) contain details on the proposed treatment, use and disposal of groundwater during the project.

NSW Health (South Western Sydney and Sydney Local Health Districts Public Health Unit) provided comments which emphasised the importance of contingencies in remediation projects to respond to events which could occur outside hours of operations, for example odours or dust, and the importance of developing a community relations strategy before work commences. NSW Health also recommended that Incident Plans be developed to cover emergency management procedures for the site and that the EMP be updated to reflect changes to the POEO Act.

The **Heritage Branch of the OEH** (as delegate for the NSW Heritage Council) did not object, however, it requested a number of changes to the Proponent's Draft Statement of Commitments regarding archival recording and excavation and the proposed interpretative signage.

Roads and Maritime Services raised no objections provided that all traffic movements associated with the project are undertaken in accordance with the Traffic and Pedestrian Management Plan included in the EA.

Strathfield City Council initially objected to the proposal, raising concerns over the potential for the project to contaminate the Chullora site's land, groundwater and surface water. It also raised concerns over potential odours and the lack of consultation with the Chullora residents.

However, additional information provided by the Proponent in a subsequent meeting held with Council officers and a follow up letter, alleviated its concerns and Council withdrew its objection. The information provided included clarification on the proposed environmental controls that would be implemented and confirmation that there would be a baseline study performed prior to any works commencing at Chullora, as well as a post treatment assessment to confirm that the site is returned to the pre-treatment condition at the completion of the works.

Council did, however, make a number of recommendations about the amount of material to be stored at Chullora, the size of the stockpiles and the need for stockpiles to be covered to minimise dust and odour emissions.

City of Sydney acknowledged the benefits of the proposal, however, it raised a number of concerns regarding noise, air quality (particularly odours) heritage, visual impacts, flora and fauna, traffic and community consultation. Council also recommended a number of conditions.

Bankstown City Council objected to the transport of contaminated material through its LGA, however, it recommended a number of conditions of approval in relation to air quality, water management, noise and vibration, waste management and traffic and transport. Note – that although the Chullora Railway Workshops and Yards site is partially within the Bankstown LGA, the project itself is located within the Strathfield LGA.

4.3 Public Submissions

Three submissions were received from the public – two from residents adjacent to the Chullora site and one from a resident adjacent to the Macdonaldtown site.

The issues raised in public submissions included:

- concern over the health risks of remediation at Chullora;
- traffic impacts, particularly in relation to the impact on the amenity of the adjacent residents;
- length of the project;
- threatened species, particularly the grey-headed flying fox;
- air quality; and
- concern over the reasons for remediation.

The Department has fully considered the issues raised in submissions in its assessment of the project.

4.4 Proponent's Response to Submissions

Eco Logical Australia, on behalf of RailCorp, provided a response to the issues raised in submissions on 8 October 2012 (refer to Appendix C). The response recommended no amendments to the project.

The Response to Submissions (RTS) included:

- additional technical information on noise,
- clarification and additional information regarding issues raised;
- an updated EMP;
- an updated Traffic and Pedestrian Management Plan;
- a revised program of works; and
- a revised statement of commitments (SoCs).

5. ASSESSMENT

In assessing the merits of the project, the Department has considered:

- the EA, submissions and the Proponent's response to submissions on the project (refer to Appendices A, B and C);
- the relevant environmental planning instruments, guidelines and policies;
- the objects of the EP&A Act, including the object to encourage ecologically sustainable development; and
- the relevant statutory requirements of the EP&A Act & Regulation.

The Department considers the key issues relate to contamination and remediation, air quality, noise and vibration. Other issues, including water, heritage, waste, traffic and flora and fauna are considered in **Table 2**.

5.1 Contamination and Remediation

Background

In 2000, the EPA determined that there were reasonable grounds to believe that contaminants on the Macdonaldtown site pose a significant risk of harm to human health or the environment, although the site has not been formally declared to pose a significant risk of harm under the CLM Act.

Investigations of the Macdonaldtown site, undertaken by CH2M Hill in 2000 and 2001, GHD in 2005 and SKM in 2006 have identified, delineated and defined the extent of contamination on-site (see Section 1.3 and Figure 3). In addition, a 2006 Human Health and Ecological Risk Assessment (HHERA) identified potential issues that should be addressed in respect of the contamination on the site. The assessment involved the identification of hazards, toxics, human health exposure scenarios and ecological risk characterisation.

The EA for the project included a Remedial Action Plan prepared in accordance with the CLM Act. The RAP identified several soil remediation technologies which would address the issues identified by the HHERA. These options were further refined in JBS's Remedial Strategy, also included in the EA.

Remedial Strategy

The preferred Remedial strategy for the site, is summarised in **Figure 8** below.

RailCorp has appointed an EPA accredited site auditor to oversee the remediation process. The accredited site auditor would review the remediation works being undertaken to ensure the work complies with current regulations and guidelines and that the remediated site is suitable for the proposed land use (industrial). The site auditor has reviewed the RAP and agrees with the remediation approach (as summarised in Figure 8), that is, removal of the source of contamination through the excavation of contaminated materials to the extent practicable, as complete removal of contaminants is not technically feasible or economically or environmentally justifiable due to geotechnical or heritage site constraints.

The treatment of contaminated material would be undertaken in a tented enclosure fitted with an air emission control system, via bioremediation at Macdonaldtown or cement stabilisation at Chullora. RailCorp has committed to the preparation of a (an auditor approved) Remedial Works Validation Plan which would define the criteria that the remediation contractor would adopt to determine whether the excavated material will be disposed directly to landfill, treated by bioremediation or treated by cement stabilisation. Pre-treatment sampling and site observations would help identify how each batch of material would be treated.

Neither the EPA nor NSW Health raised any concerns over the remediation strategy. However, the site auditor has not yet prepared a site audit report based on the Remedial Strategy involving bioremediation (JBS 2011). As such, the Department has recommended a condition requiring the remediation of the site be undertaken in accordance with an EPA accredited Site Auditor approved RAP and Remedial Strategy. The Department has also recommended that any amendments to the RAP and Remedial Strategy are approved by the Site Auditor prior to being implemented.

Strathfield Council initially raised some concerns over the proposed use of the Chullora site, particularly in relation to air impacts (discussed below) and the potential for the project to contaminate a previously uncontaminated site. As part of its commitment to ensure that the project does not lead to legacy contamination at Chullora, RailCorp has committed to undertaking a baseline study and post remediation study of the Chullora site to demonstrate that its condition is unaffected by the works. This is also reflected in the Department's recommended conditions. Following further consultation, as well as review of the draft conditions, Strathfield Council agree that with the implementation of the recommended conditions and RailCorp's commitments, potential contamination impacts at the Chullora site can be managed appropriately.

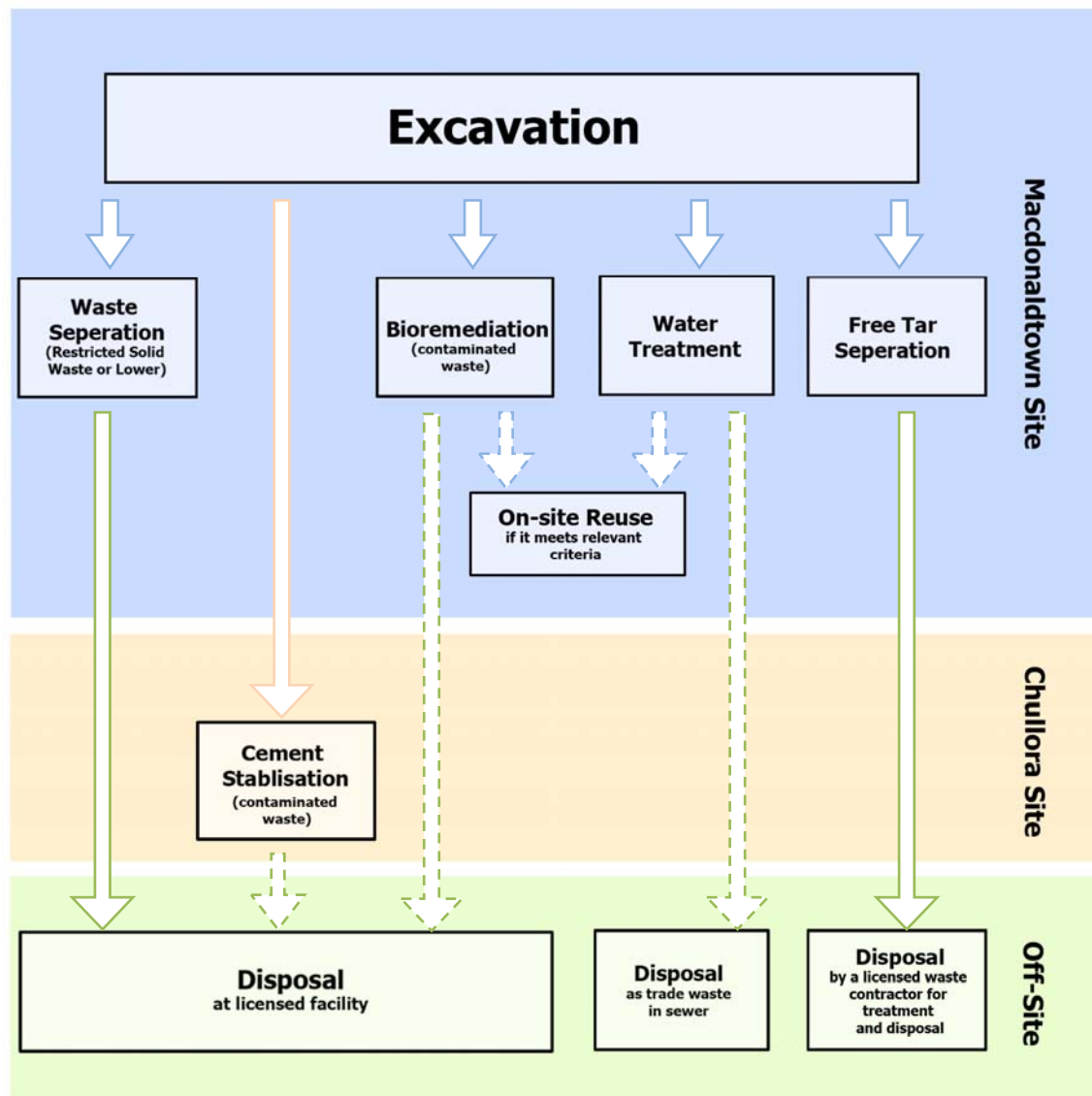


Figure 8: Remedial Strategy

Validation

The RAP includes validation criteria, which were developed to define an appropriate end point to the remediation. These represent the proposed levels for remediating the site to prevent on-going migration of contaminants from the site through groundwater and to protect human health consistent with the future land use of the site (industrial). The calculated values are depth dependent, based on risks to future site users associated with exposure to contaminated soil material or vapours (as identified by the HHREA) and present four depth ranges (from 0 to 8m) (details in table 4.1 in the RAP).

Any material to be reused on-site has to meet both the total concentration validation level and the site specific leachability criteria which were based on criteria derived for protection of groundwater resources in the area.

Notwithstanding, RailCorp has identified that site constraints (namely heritage or geotechnical) may make it impossible to remove all contamination, in which case the remaining material would be capped and managed via a Long Term Environmental Management Plan approved by the Site Auditor. This plan would be designed to ensure activities which could potentially or directly result in exposure of future land users to the contaminated soils beneath the physical barrier are prevented or limited and controlled. The requirement for the preparation and implementation of this plan has been included in the recommended conditions.

The accredited Site Auditor agrees with the validation approach however he had some comments about some of the validation criteria. The Department notes that RailCorp has committed to the preparation of an auditor approved Remedial Works Validation Plan, prior to construction (as mentioned above), as well as a Validation Report upon completion of the works. The Department has also included these reports in its recommendations.

In addition, the Department has included a condition in the recommended instrument requiring that following completion of the works, RailCorp must provide the Department with a Site Audit Statement and Site Audit Report. These reports which will certify that the remedial works were carried out in accordance with the RAP, the Remedial Strategy, Project Approval conditions and any recommendations made by the Site Auditor, and will certify that the area is suitable for its intended use.

However, the Site Auditor has advised that he would not issue a Site Audit Statement until after the completion of groundwater monitoring, which would be undertaken over a number of years. As such, the Department has also included a recommendation requiring the Proponent to demonstrate upon completion of the Project, that the Site Auditor has prepared an Interim Audit Advice letter in accordance with the requirements of the NSW EPA *Guidelines for the NSW Site Auditor Scheme* endorsing the completion of active remediation works. The EPA agrees that the timing of these conditions is suitable.

Conclusion

The Department and the EPA are satisfied, particularly given the involvement of an accredited site auditor, that the Proponent has demonstrated that the proposed method of remediation is feasible and will ensure that the site will be suitable for its proposed future use.

5.2 Air Quality and Odour

The key components of the project that are likely to generate dust and odour include:

- *at Macdonaldtown*
 - excavation of odorous material such as polycyclic aromatic hydrocarbons including benzo(a)pyrene and total petroleum hydrocarbons including benzene and xylene;
 - excavation of asbestos containing material;
 - loading and transport of material;
 - remediation activities, including pre-treatment, crushing and bioremediation within enclosed shed under negative air pressure;
 - treatment of contaminated groundwater on-site in a water treatment system;
 - contaminated groundwater ponded within excavations;
 - outdoor stockpiling of contaminated and treated soil; and
 - reinstatement of excavations using VENM.
- *at Chullora*
 - receipt of contaminated material containing volatile organic compounds;
 - remediation works including cement stabilisation within enclosed tent under negative air pressure;
 - outdoor stockpiling of treated soil.

The nearest residences to both sites are shown in Figures 2 and 5. At Macdonaldtown, residences in Burren Street are located immediately west of the site and approximately 10m from the proposed remedial works. At Chullora, residences in Marlene Crescent are located around 150m to the east of the site.

Both the Macdonaldtown and Chullora sites are located within dense urban areas close to heavy rail infrastructure and large volumes of road traffic. These areas often experience background concentrations that exceed relevant dust criteria (annual PM_{10}).

JBS Environmental carried out air quality and health risk assessments for both the Macdonaldtown and Chullora sites in accordance with relevant guidelines. Detailed air quality management plans for both sites were also included in the EA. The air quality assessments predicted worst-case dust and odour impacts at the nearest receivers, analysing particulates (fine and total), benzene and benzo(a)pyrene as the primary air pollutants and chemicals of potential concern. Specific air quality controls were developed and incorporated into the model to predict likely impacts for each stage of remediation works. With air quality controls in place, the assessment predicted:

- *at Macdonaldtown*
 - exceedance of annual PM_{10} criteria, at the nearest residential receivers during stage 1 works (earthworks across the entire site). A worst case of $50\mu g/m^3$ was predicted (criteria is $30\mu g/m^3$). However, this was based on a conservative assumption comparing a 3 monthly average to the annual average and assuming that works would be undertaken every day, rather than 6 days/week as proposed. Therefore, it can be assumed that actual PM_{10} levels will be lower than the predicted $50\mu g/m^3$;
 - a marginal exceedance of benzo(a)pyrene criteria at one residential receptor during remediation stages 2 and 3. A worst case of $0.43\mu g/m^3$ was predicted (criteria is $0.4\mu g/m^3$). This was based on a conservative assumption using maximum values rather than mean values;
 - compliance with all other dust (total suspended particulates and 24 hour PM_{10}) and odour criteria for all stages of remediation works; and
 - chemicals of potential concern (benzene and benzo(a)pyrene) would be well below relevant hazard and risk criteria for the duration of the project.
- *at Chullora*
 - compliance with all dust and odour criteria for all stages of remediation works at the nearest residential receivers; and
 - chemicals of potential concern (benzene and benzo(a)pyrene) would be well below relevant hazard and risk criteria for the duration of the project.

To address the potential exceedance of PM_{10} during remediation works at Macdonadltown, RailCorp has committed to implementing a range of air quality controls to minimise impacts at receivers, including:

- a tent enclosing treatment works under negative pressure with an air filtration system utilising granular activated carbon filters (at both sites);
- limited size of excavations outside enclosures to less than $400m^2$;
- water misting system on-site boundaries close to residential premises where soil handling is in close proximity (Macdonaldtown);
- hourly watering of exposed soil surfaces and haul roads; and
- all external stockpiles covered with high density polyethylene (HDPE) liner (Chullora).

In order to minimise odorous emissions (from disturbance of coal tar impacted material), RailCorp has committed to:

- locating the water treatment plant in the centre of the Macdonaldtown site, away from residences, as the treatment of coal tar impacted groundwater has the potential to generate offensive odour; and
- ensuring material heavily impacted with coal tar (including hazardous liquid waste) is not transported to Chullora, thereby minimising the potential for odorous emissions at Chullora.

As the proposed air quality controls are critical for minimising the dust and odour impacts of the project, RailCorp has committed to implement these controls via the air quality management plans. The Department has reflected this commitment in the recommended conditions of approval.

Several submissions raised odour and dust monitoring as important issues, including the City of Sydney, EPA, Strathfield Council, NSW Health and some residents. The Department is satisfied that the air quality management plans include adequate controls and monitoring, including:

- daily monitoring of the air filtration system on the enclosures;
- twice daily odour monitoring, and hourly when handling malodorous material outside the enclosure;
- monitoring of volatile organic compounds (VOCs) whilst handling malodorous material outside the enclosure;
- monitoring of coarse and fine particulates for the duration of works;
- static asbestos monitoring at three locations at the Macdonaldtown site boundary during excavation in areas known or suspected to contain asbestos; and
- detailed contingency measures should monitoring indicate exceedances of relevant criteria.

The EPA recommended that the air filtration system be monitored daily, and that an emission limit and monitoring requirements be included for benzo(a)pyrene. The EPA also indicated the importance of a complaints management system for responding to odour concerns.

In its RTS, RailCorp identified an action level of $0.4\mu\text{g}/\text{m}^3$ for benzo(a)pyrene with daily monitoring to occur at the water treatment plant whilst in use and/or at excavations where groundwater is to remain ponded overnight. These controls have been incorporated into the recommended conditions. RailCorp has also committed to implementing a community relations strategy detailing procedures for responding to dust and odour complaints.

In its submission, Strathfield Council noted concerns regarding odour management and potential leaching of contaminants from uncovered material at Chullora. To address these concerns, RailCorp has committed to limit the surface area of uncovered and untreated material at Chullora to less than 150m^2 and to cover all stockpiles with HDPE liner to minimise the potential for dust and odour emissions.

The Department acknowledges that RailCorp has developed and committed to detailed and comprehensive air quality management measures (as described in the air quality management plans in the EA). Given the importance of these management measures for managing air quality and odour impacts, the Department has adopted the commitments as conditions and has recommended additional conditions. In summary, the Department has recommended:

- air quality criteria for particulate matter, deposited dust and benzo(a)pyrene;
- restrictions on the size of exposed areas;
- requirement to cover stockpiles;
- requirement to implement the air quality management plans;
- monitoring requirements including real-time asbestos monitoring; and
- requirement to notify residents prior to undertaking works that involve asbestos removal.

The Department concludes that whilst there are likely to be some occasional exceedances of dust and odour criteria for short durations, there will be best practice control measures in place to minimise impacts on the nearest receivers. The EPA was satisfied with the proposed mitigation measures and recommended conditions. The Department acknowledges that the excavation of coal-tar impacted soils will generate odour, however, the long-term benefits of removing these contaminants from the site outweigh the short-term odour impacts that may occur, particularly given that these can be managed to acceptable levels.

5.3 Noise and Vibration

Acoustic Logic completed noise and vibration assessments to determine the potential impacts of remediation works at Macdonaldtown and Chullora. The assessment predicted noise levels at the nearest residences and neighbouring industrial premises from static and mobile equipment and also considered road traffic noise. In relation to vibration, the assessment considered the impacts in terms of human comfort and damage to buildings.

The Macdonaldtown site is located in an area dominated by rail traffic noise, being located immediately adjacent to the Illawarra rail corridor and the Macdonaldtown rail stabling yards. A concrete noise wall is located along the southern boundary between the site and the Illawarra railway line. There are approximately 17 residential properties adjacent to the western boundary of the site on Burren Street, being a mixture of detached and terrace style dwellings. Background noise levels of 45dBA were recorded at these residential premises. Residences at the southern end of Burren Street adjacent to the rail corridor experience peaks in noise from passing trains, measured at 57dBA.

The activities most likely to generate high noise levels during the project include:

- bored piling along the western site boundary to create retaining structures prior to excavation and construction of the enclosure (Macdonaldtown only);
- an hydraulic hammer used inside the enclosure (to demolish the remnants of the northern gasholder at Macdonaldtown);
- excavators with buckets operating outside the tented enclosure;
- use of a pug mill (for cement stabilisation works at Chullora) inside the tented enclosure; and
- trucks with dog trailers transporting material from Macdonaldtown to Chullora.

The noisiest works (bored piling and hydraulic hammers) would be undertaken for a period of 7-14 days each (a total period of 1 month). Excavations undertaken in closest proximity to residential premises would be undertaken within a 7mm thick polyvinyl enclosure, designed to provide noise reduction and odour control. Excavators outside of the enclosure would operate at various stages throughout the project and at varying distances from the residential premises.

Activities that would generate excessive vibration include:

- piling along the western site boundary to create retaining structures prior to excavation (Macdonaldtown);
- use of an hydraulic hammer to demolish the remnants of the northern gasholder (Macdonaldtown);
- use of excavators inside and outside of the enclosure; and
- use of a pug mill for cement stabilisation inside the enclosure (Chullora).

Noise

The assessment established project specific noise levels (PSNL's) in accordance with the EPA's *Interim Construction Noise Guideline (ICNG)*, being background noise plus 10dBA for the nearest affected residences. At the residences in Burren Street Macdonaldtown, the PSNL is 55dBA. The assessment predicted that the residences on Burren Street would experience noise levels substantially exceeding the PSNL's during certain site works given they are located only 10m from the proposed excavation. The predicted noise level during bored piling activities is 93dBA, some 38dBA above the PSNL. Excavation using buckets and hydraulic hammers is also predicted to exceed the PSNL by up to 40dBA. These works would be limited in duration to 7-14 days each.

At Chullora, noise levels are predicted to remain below the PSNL of 56dBA for the nearest receivers in Marlene Crescent for the duration of works. Similarly, noise levels would remain below the PSNL of 75dBA at the neighbouring industrial premises to the west for the duration of works.

The analysis of road traffic noise concluded that noise levels would increase by 0.03dBA at residences adjacent to Erskineville Road at Macdonaldtown and by 0.2dBA at the Hume Highway near the Chullora site. The predicted increases are well below the RTA's *Environmental Criteria for Road Traffic Noise* (which allows for an increase of up to 2dBA). The assessment also predicted noise levels for residents on Erskineville Road associated with a truck and train passing simultaneously, concluding that this would result in an increase of 1.7dBA above levels experienced when only a train is passing. The assessment concluded that noise from traffic associated with the project would not be significant.

Where noise levels are predicted to exceed the PSNL's after application of all reasonable and feasible mitigation measures, the ICNG specifies a maximum acceptable construction noise level of 75dBA at the nearest receptors. The *WorkCover Code of Practice for Managing Noise and Preventing Hearing Loss at Work* specifies a noise level of 85dBA for workers on site over an 8 hour work day. The predicted noise levels at Macdonaldtown are significantly higher, up to 95dBA on site and only marginally less at the nearest residences on Burren Street (during noisiest works). To address these noise impacts, RailCorp has proposed a range of mitigation measures, including:

- direct negotiation with affected residents to establish preferred respite periods for noisy works;
- enclosure of the western façade of the excavation-site with 7mm thick polyvinyl, with no doors on this side and all gaps acoustically sealed;
- acoustic silencers on the ventilation system on the enclosure;
- excavator and hydraulic hammer to be located a minimum of 8m away from residences;
- restrict the hours of operation for piling works;
- locate static plant and truck un/loading zones as far from residents as possible;
- trucks to be fitted with smart alarms instead of traditional reversing beepers; and
- fortnightly noise checks of all equipment and installation of mufflers or engine shrouds if required.

Some of these measures would also be implemented at Chullora, such as the polyvinyl enclosure for the treatment area, acoustic silences for the ventilation system and the use of smart alarms on trucks.

In its submission, the EPA identified the need for a detailed noise and vibration management plan, respite periods for noisy works and smart alarms for all vehicles.

No public submissions raised concern about noise.

The works would be restricted to standard construction hours and would be carried out over a total period of 24 months (including site preparation and final reinstatement). However, the noisiest works would be during demolition and early works, which would take a maximum of 1 month.

Given the potential for significant exceedances of acceptable noise criteria at Macdonaldtown, the Department has requested that RailCorp give further consideration to noise management strategies. In its response to submissions, RailCorp included the above mitigation measures in its statement of commitments and included a commitment to develop a communications strategy for residents.

Although the project would not comply with the EPA construction noise criteria at the nearest residences in Macdonaldtown, the Department recognises that:

- the noisiest works would be of short duration (up to 1 month);
- RailCorp has committed to substantial noise controls, such as enclosing the excavation area; and
- RailCorp would implement a communications strategy to keep residents informed of noisy works, negotiate appropriate respite periods and identify other management measures tailored to the residents needs.

Despite the proposed management measures, the Department considers it necessary that further measures be developed to protect the amenity of the residences on Burren Street and ensure compliance with WorkCover's Code of Practice. In addition to RailCorp's commitments, the Department has recommended conditions of approval that would require RailCorp to:

- comply with construction noise criteria of 75dBA at the residences in Burren Street;
- prepare and implement a detailed Noise and Vibration Management Plan (CNVMP) including strategies for minimising noise that have been developed in consultation with the nearest residences;
- detail procedures for ensuring compliance with WorkCover's *Code of Practice for Managing Noise and Preventing Hearing Loss at Work* on site and at the residences in Burren Street;
- monitor and comply with the noise criteria included in the recommended conditions;
- regularly assess the noise monitoring data and relocate, modify, mitigate and/or stop operation on-site to ensure compliance with the criteria set in the approval;
- carry out the project in accordance with the CNVMP; and
- implement a Community Stakeholder Involvement Plan including procedures to respond to and manage noise complaints.

The Department acknowledges that the project would not comply with the relevant EPA construction noise criteria at some residential locations during noise intensive works such as bored piling and hydraulic hammering (1 month duration). However, the Department has recommended conditions that would require RailCorp to implement all reasonable and feasible measures to minimise noise. The Department considers the CNVMP to be critical for ensuring that noise impacts are appropriately managed. The CNVMP must be informed by comprehensive consultation with the residents on Burren Street, including management measures for the noisiest works that are prepared in consultation with the community. The CNVMP must also include procedures for ensuring compliance with WorkCover's Code of Practice which may require detailed work scheduling.

With these conditions in place, the Department is satisfied that the noise and vibration impacts associated with the project can be effectively managed.

Vibration

The vibration assessment predicted that bored piling on the western boundary may exceed the human comfort criteria (maximum 0.4m/s^{1.75}) due to the proximity to residences. The nearest residential building is 12 metres from the northern gasholder and the rear boundary of this property only 5 metres away.

The assessment also established building damage criteria of 3mm/s peak particle velocity (PPV) for heritage structures, 5mm/s PPV for residential and 20 mm/s for rail track. The assessment predicted that the building damage criteria are unlikely to be exceeded.

At Chullora, residences are located 150 metres away, and are unlikely to experience unacceptable vibration impacts. Therefore, the rail track located adjacent to the northern boundary of the site becomes the limiting criteria for vibration. The assessment recommends that excavators and the pug mill be kept at least 10 metres away from the rail track.

A range of control measures are recommended for minimising vibration impacts to reduce the likelihood of exceeding the human comfort criteria and to keep vibration levels below the building damage criteria. The recommended controls include:

- maintain a minimum distance of 8 metres from residential dwellings (note this is not possible for the nearest dwelling at Macdonaldtown);
- restrict operating hours and use respite periods;
- change the speed of piling; and
- use vibration monitors with alarms on the nearest residential dwellings and the heritage structure (southern gasholder).

In addition to these controls, the Department recommends that dilapidation surveys and property inspections be carried out prior to works commencing at Macdonaldtown and again following completion of works to establish the condition of the:

- residential properties on Burren Street, adjacent to the site;
- southern gasholder;
- noise wall along the southern boundary of the site;
- rail tracks and buildings within the Macdonaldtown Stabling Yard including pavement and services;
- services on the western embankment; and
- overhead wiring structure along the Illawarra rail line.

The Department has also adopted the recommended building damage criteria as recommended conditions. The Department is satisfied that the proposed controls and recommended conditions would manage vibration to acceptable levels. The proposed vibration monitoring should ensure that any exceedance of the criteria is promptly recognised and appropriate action taken to mitigate impacts.

5.4 Other Issues

Table 3 – Department's Assessment of Other Issues

Assessment	Recommended Conditions
Water	
Groundwater <ul style="list-style-type: none"> • A geotechnical survey in 2010 identified groundwater at a depth of approximately 4m, with a perched (or shallow) aquifer at approximately 1.5m deep. Groundwater flows toward the south/south-east. • Both the shallow and deep aquifers are contaminated with hydrocarbons and heavy metals due to leaching of contaminants from the site. • The project does not involve remediation of groundwater, but removal of the contaminant source, and hence natural attenuation is anticipated to occur. • Excavations would generally be 4m deep and up to 8m in the vicinity of the northern gas holder and tar wells. • During excavation, groundwater would be intercepted, with 300-400m³ of 	<p>The Proponent is required to:</p> <ul style="list-style-type: none"> • Obtain licences in accordance with the <i>Water Act 1912</i> and/or <i>Water Management Act 2000</i>; • Design and construct the WTS to comply with the <i>Protection of the Environment Operations Act 1997</i>, City of Sydney and Sydney Water requirements. The design is to be

Assessment	Recommended Conditions
<p>inflow a day predicted (worst case).</p> <ul style="list-style-type: none"> • A water treatment system (WTS) would be established for the project to treat all groundwater collected in excavations. • Trials of the proposed WTS have indicated that the system can meet all criteria defined in the Remedial Strategy (with the exception of arsenic) for effluent reuse on-site or discharge to Council's stormwater system. An acid washed granular activated carbon filter is proposed and is expected to minimise arsenic to acceptable levels. • Wastewater not meeting reuse or stormwater criteria would be discharged to sewer in accordance with a Sydney Water Trade Waste Agreement. • There are four groundwater monitoring wells located south-east of the site. An additional 8 wells would be installed on the site to monitor groundwater post-remediation. • The monitoring program would assess the stability of the contaminant plumes and whether natural attenuation is occurring. • The monitoring program has been described in the RAP and has been reviewed by the Site Auditor. The auditor noted that the strategy is appropriate and indicated that any changes would need to be approved by the Site Auditor. • In its submission NOW supported the strategy of monitored natural attenuation and noted the requirement for licences for groundwater monitoring bores. NOW also requested that it be consulted during preparation of the Long Term EMP which includes the groundwater monitoring program. • The Department is satisfied that the project would improve groundwater quality in the long-term and that the proposed monitoring and management measures would ensure that short-term impacts on groundwater would be minor. <p>Surface Water</p> <ul style="list-style-type: none"> • An Environmental Management Plan (EMP) submitted with the EA details measures to manage surface water at Macdonaldtown and Chullora during the project. Management measures include diversion of stormwater away from contaminated areas, the installation of sediment fences, covering of stockpiles and, at Macdonaldtown, haul routes on-site would be separate for contaminated and non-contaminated transport. • The Department considers the proposed controls are appropriate for managing erosion and sedimentation during the project and recommends that the measures be formalised in an Erosion and Sediment Control Plan. 	<p>approved by the Site Auditor prior to construction;</p> <ul style="list-style-type: none"> • Prepare and implement a groundwater monitoring plan in accordance with the strategy of monitored natural attenuation described in the RAP. The plan is to be prepared in consultation with NOW and be approved by the Site Auditor prior to construction; and • Prepare and implement a Long Term EMP for the Macdonaldtown site incorporating the groundwater monitoring plan. <p>The Department recommends that the Proponent prepare and implement an Erosion and Sediment Control Plan in accordance with relevant guidelines.</p>
Heritage	
<p>Background</p> <ul style="list-style-type: none"> • The Macdonaldtown site is listed on the State Heritage Register as part of the Eveleigh Railway Workshops and the S170 Heritage and Conservation Register of the State Rail Authority, including a particular listing for the standing southern gasholder (as the only one remaining in NSW). • City Plan Heritage undertook a detailed heritage impact assessment which included test trenches to determine the extent, condition and significance of below ground structural remains. • The site contains two significant heritage items, being the southern gasholder and the remnant brick annulus of the northern gas holder. The remainder of the site contains ground level surfaces of demolished sheds, structures, paths and railway tracks. <p>Consultation</p> <ul style="list-style-type: none"> • The Heritage Council commented on the mitigation measures proposed in the EA and requested some amendments which were included in RailCorp's RTS. • The City of Sydney requested that the proposed measures to minimise impacts on the neighbouring Burren Estate Heritage Conservation Area be incorporated into the statement of commitments. <p>Impacts and Mitigation</p> <ul style="list-style-type: none"> • The southern gasholder would not be impacted by remediation works. • Excavation works would impact on the brick annulus of the northern gasholder as it would be demolished to remove contaminated material. • RailCorp has committed to a range of measures to minimise impacts and to retain the heritage legacy of the site. These include: <ul style="list-style-type: none"> - avoiding damage to the southern gasholder during excavation; - archival recording prior to excavation, archaeological monitoring during excavation and reinstatement of the brick annulus using the existing 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> • Protect the southern gasholder throughout remediation and reinstatement works; • Carry out a contamination assessment around the brick annulus of the northern gasholder prior to excavation; • Conduct archival recording prior to excavation around the northern gasholder; • Conduct archaeological monitoring during excavation around the brick annulus of the northern gasholder in accordance with Heritage Council guidelines; • Prepare and implement a heritage mitigation plan to protect the houses on the eastern side of Burren Street; and • Install interpretive signage to document the heritage

Assessment	Recommended Conditions
<ul style="list-style-type: none"> bricks if they are not contaminated; archaeological excavation in the area of the Retort House and Superintendents residence to further document the heritage aspects of the site; and Heritage interpretation signage in at least five locations around the site. The Department is satisfied that the heritage impacts are minor and can be appropriately managed via the recommended conditions. 	<p>significance of the site, in consultation with City of Sydney Council.</p>
Waste	
<ul style="list-style-type: none"> Waste produced during the remediation works would primarily be excavated contaminated material and contaminated groundwater. The contaminated material would fall into several classifications, including hazardous waste, special waste (asbestos), restricted waste and general solid waste. Liquid waste would also be extracted, including free tar (sludge), impacted surface water, groundwater and wastewater from decontamination activities. The Water Treatment System (WTS) would also generate various wastes including free oil, filter bags, activated carbon filter media. The RAP and Remedial Strategy require all contaminated wastes to be sampled prior to treatment or disposal at appropriately licensed facilities. RailCorp has committed to the preparation of a Waste Management Plan to detail licence requirements, waste tracking procedures, classification and disposal protocols and incident response procedures. In its submission, the City of Sydney recommended conditions for the management of asbestos waste, which the Department has included. The Department is satisfied that wastes would be appropriately managed through implementation of the RAP, Remedial Strategy and Waste Management Plan. 	<p>The Department has recommended conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> Classify, transport and dispose of waste in accordance with relevant guidelines; Ensure no hazardous (liquid) waste is transported to Chullora for treatment; Handle and dispose of asbestos waste in accordance with relevant national legislation and Council guidelines; and Prepare and implement a Waste Management Plan, including strategies to minimise waste.
Traffic	
<p>Macdonaldtown</p> <ul style="list-style-type: none"> The project is estimated to generate a maximum of 65-70 heavy vehicle movements per day, or 6-7 vehicles movements per hour. The site would be accessed from Erskineville Road via an internal site road adjacent to the railway line. Movements are restricted to left-in, left-out. There is an alternative gated access from Burren Street, which would not be used for the project. The predicted 6-7 vehicle movements per hour represents less than 1% of all traffic movements during the AM and PM peak periods on Erskineville Road. <p>Chullora</p> <ul style="list-style-type: none"> Trucks transporting contaminated material would access the site from Worth Street near the roundabout with Beaufort Place. The traffic assessment concludes that there would be no measurable impact from the additional 6-7 movements per hour. The Department notes that the assessment is conservative, in that it assumes all material from Macdonaldtown being transported to Chullora, when the actual amount is expected to be around 75%. The 6-7 movements per hour represent the maximum, due to the time taken to load each vehicle. Therefore, the Department considers that the worst-case 6-7 truck movements per day are unlikely to impact on the road network. <p>Consultation</p> <ul style="list-style-type: none"> City of Sydney requested some amendments to the Traffic & Pedestrian Management Plan which was updated in RailCorp's RTS. Bankstown Council requested a dilapidation report for Worth Street, which RailCorp has adopted in its Statement of Commitments and the Department has included as a recommended condition. RMS was satisfied with the Traffic and Pedestrian Management Plan. <p>Mitigation and Conclusion</p> <ul style="list-style-type: none"> RailCorp has committed to a range of management measures for controlling truck movements, minimising disruption to residences and avoiding spills of contaminated material onto roads. These measures include the use of a traffic controller to manage trucks entering and exiting the Macdonaldtown site from/to Erskineville Road and are detailed in a Traffic and Pedestrian Management Plan submitted with the EA and a commitment to the preparation of an Incident Management Plan. The Department is satisfied that the traffic impacts of the project can be 	<p>The Department recommends that the Proponent:</p> <ul style="list-style-type: none"> Update the Traffic and Pedestrian Management Plan to include consultation with Strathfield Council (in relation to the Chullora site) Prepare and implement a Driver Code of Conduct; Ensure no heavy vehicles to access the site from Burren Street; Ensure no queuing on public roads; Employ traffic controllers at the access to Macdonaldtown site for the duration of work; and Prepare a dilapidation report for Worth Street prior to and following completion of the project, and submit copies of the report to Bankstown Council.

Assessment	Recommended Conditions
adequately managed via the Traffic and Pedestrian Management Plan and a number of additional traffic management conditions.	
Flora and fauna	
<ul style="list-style-type: none"> Both sites are highly degraded and primarily covered with exotic grasses and a few mature trees. The project would likely require the removal of all vegetation on-site. No threatened fauna species were identified on either site. The assessments for both sites concluded that the project would not have a significant impact on threatened species. <p>Mitigation and Conclusion</p> <ul style="list-style-type: none"> RailCorp has committed to the preparation and implementation of a weed control protocol and boundary replanting at Macdonaldtown in consultation with adjacent residents on Burren Street. The Department has also recommended a condition to this effect. None of the agencies raised concerns over impacts on flora and fauna. However the City of Sydney Council requested that RailCorp try to retain vegetation along the western boundary, or replant if retention is not possible. RailCorp has already made these commitments. The Department is satisfied that the recommended conditions and commitments by RailCorp would ensure that biodiversity impacts would be negligible. 	<p>The Department has recommended conditions requiring the Proponent to:</p> <ul style="list-style-type: none"> Limit vegetation clearing; Rehabilitate both sites by replanting with mature trees, in consultation with City of Sydney and Strathfield Councils; Replant trees along the western boundary of the Macdonaldtown site in consultation with the residents on Burren Street; and Implement an Erosion and Sediment Control Plan.

6. CONCLUSION

The Department has assessed the merits of the project having regard to the objects of the EP&A Act and the principles of ecologically sustainable development. This assessment has concluded that the project would:

- remove a long term contaminant source from the Macdonaldtown site and render it suitable for industrial uses;
- result in short term noise impacts on the residences along Burren Street, most notably during works utilising bored piling and an hydraulic hammer (a period of up to 1 month);
- have the potential to lead to isolated exceedances of dust criteria (annual PM₁₀) at the Macdonaldtown site;
- meet relevant odour criteria;
- remove the contaminant source to groundwater and provide for long term groundwater monitoring at Macdonaldtown; and
- meet all noise, air quality and odour criteria at the Chullora site.

With the proposed mitigation measures, and the recommended conditions, the Department is satisfied that the noise and air quality impacts of the project can be managed to acceptable levels. RailCorp has committed to conducting a large area of excavation at Macdonaldtown within a tented enclosure to reduce noise impacts and minimise dust and odour emissions. Similarly, a tented enclosure would be utilised for the treatment of material at the Chullora site, to minimise dust and odour emissions. The Department is satisfied that these measures would substantially reduce the potential impacts of the project. The Department is also satisfied that the project would reduce the long term risk of harm to human health and the environment by remediating the site in accordance with the requirements of the *Contaminated Land Management Act, 1997*.

Consequently, the Department believes the Project is in the public interest and should be approved subject to conditions.

7. RECOMMENDATION

It is recommended that the Director-General:

- **consider** the findings and recommendations of this report;
- **approve** the Project Application, subject to conditions, under section 75J of the EP&A Act; and
- **sign** the attached instrument of approval (refer Appendix E).



20.12.12

Chris Wilson
Executive Director
Major Projects Assessment

Chris Ritchie
Manager – Industry
Industry Projects

Sam Haddad
Director-General

APPENDIX A ENVIRONMENTAL ASSESSMENT

See the Department's website at:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3422

APPENDIX B SUBMISSIONS

See the Department's website at:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3422

APPENDIX C PROPONENT'S RESPONSE TO SUBMISSIONS

See the Department's website at:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=3422

APPENDIX D CONSIDERATION OF ENVIRONMENTAL PLANNING INSTRUMENTS

Section 75(2) of the *Environmental Planning and Assessment Act 1979* requires that reference be made to the provisions of any environmental planning instrument that would (but for Part 3A of the Act) substantially govern the carrying out of the project. Consideration of the proposed development in the context of the objectives and provisions of the relevant environmental planning instruments is provided below.

State Environmental Planning Policy No. 55 – Remediation of Land

Clause 7 of the *State Environmental Planning Policy No.55 – Remediation of Land* (SEPP 55) states that a consent authority must not consent to the carrying out of any development on land unless:

- (a) *it has considered whether the land is contaminated, and*
- (b) *if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
- (c) *if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose*

SEPP 55 aims to ensure that potential contamination issues are considered in the determination of a development application. A Remediation Action Plan has been prepared for the site in accordance with SEPP 55, RailCorp has also advised that it would be engaging an accredited site auditor who would ensure that remediation is undertaken so that the site is suitable for its intended use.

State Environmental Planning Policy 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development SEPP 33 aims to identify proposed developments with the potential for significant off-site impacts, in terms of risk and/ or offence (odour, noise etc). A development is defined as potentially hazardous and/ or potentially offensive if, without mitigating measures in place, the development would have a significant risk and/ or offence impact, on off-site receptors. SEPP 33 was considered as part of the project. A number of hazard related conditions have been recommended in accordance with the provisions of the SEPP.

State Environmental Planning Policy (Major Development) 2005

The State Environmental Planning Policy provides development controls for a number of state significant sites. The Macdonaldtown site falls within the Redfern-Waterloo Authority Sites and zoned Special Purpose Zone, Infrastructure under Schedule 3, Part 5 of the State Environmental Planning Policy (Major Development) 2005.

Strathfield Planning Scheme Ordinance 1969

The Strathfield Planning Scheme Ordinance 1969 provides development controls for all development in the Strathfield local government area. The project is located on land zoned 4(a) General Industrial. The Chullora site is zoned Special Uses 5(b) – Railways under the Strathfield Planning Scheme Ordinance 1969 and any works are permitted with consent in this zone.

APPENDIX E RECOMMENDED CONDITIONS OF APPROVAL
