



17 February 2014

Stack Demolition Management Plan, Port Kembla Copper Smelter and Refinery Port Kembla NSW

Submitted to:

Port Kembla Copper Pty Ltd
Military Road
PORT KEMBLA, NSW 2505

REPORT



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1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was engaged by Port Kembla Copper Pty Ltd (PKC) to prepare a Stack Demolition Management Plan (SDMP) for the demolition of the 200 m stack at the former Port Kembla Copper Smelter and Refinery on Military Road, Port Kembla, NSW (the site). Demolition of the stack is proposed for the morning of 20 February 2014. The objective of the SDMP is to provide general guidance to site managers and workers so that activities associated with demolition of the stack are carried out in manner which:

- Is environmentally, socially and economically responsible.
- Minimises the potential for adverse impacts to occupants, environmental receptors and infrastructure in areas surrounding the site.
- Is consistent with the requirements of the (then) NSW Department of Planning's (DoP) Project Approval (Application No. 08_0191, 15 August 2010) (Project Approval) and the site Environmental Protection Licence (EPL, no. 1753)

Recent comments from the Department of Planning and Infrastructure (DPI) (26 August 2013, 3 October 2013 and 14 December 2013), the Environment Protection Authority (EPA) (22 August 2013, 30 September 2013, 6 December 2013 and 5 February 2014) and Wollongong City Council (WCC) (22 August 2013, 2 October 2013 and 31 January 2014) have been taken into consideration in preparing this SDMP.

The individual management plans included in this SDMP include:

- Air Quality (Section 4.2.1).
- Noise and Vibration (Section 4.2.2).
- Traffic (Section 4.2.3).
- Construction Heritage Management Plan (Section 4.2.4).

Other plans required under the Project Approval are addressed in the Demolition Management Plan (Golder, 16 December 2010) (DMP) and include the following:

- Soil and Water.
- Waste.
- Green and Golden Bell Frog.

Updates to the above listed plans are not required since the stack demolition is not considered to cause or necessitate changes to the management approaches for these elements - as described in DMP (Golder, 16 December 2010). However, some additional information requested by EPA (22 August 2013, 6 December 2014 and 5 February 2014) and DPI (26 August 2013 and 14 December 2014) in relation to soil, water and waste management has been included in this document for completeness.

Associated management plans and documents also required by the Project Approval and which have been prepared include:

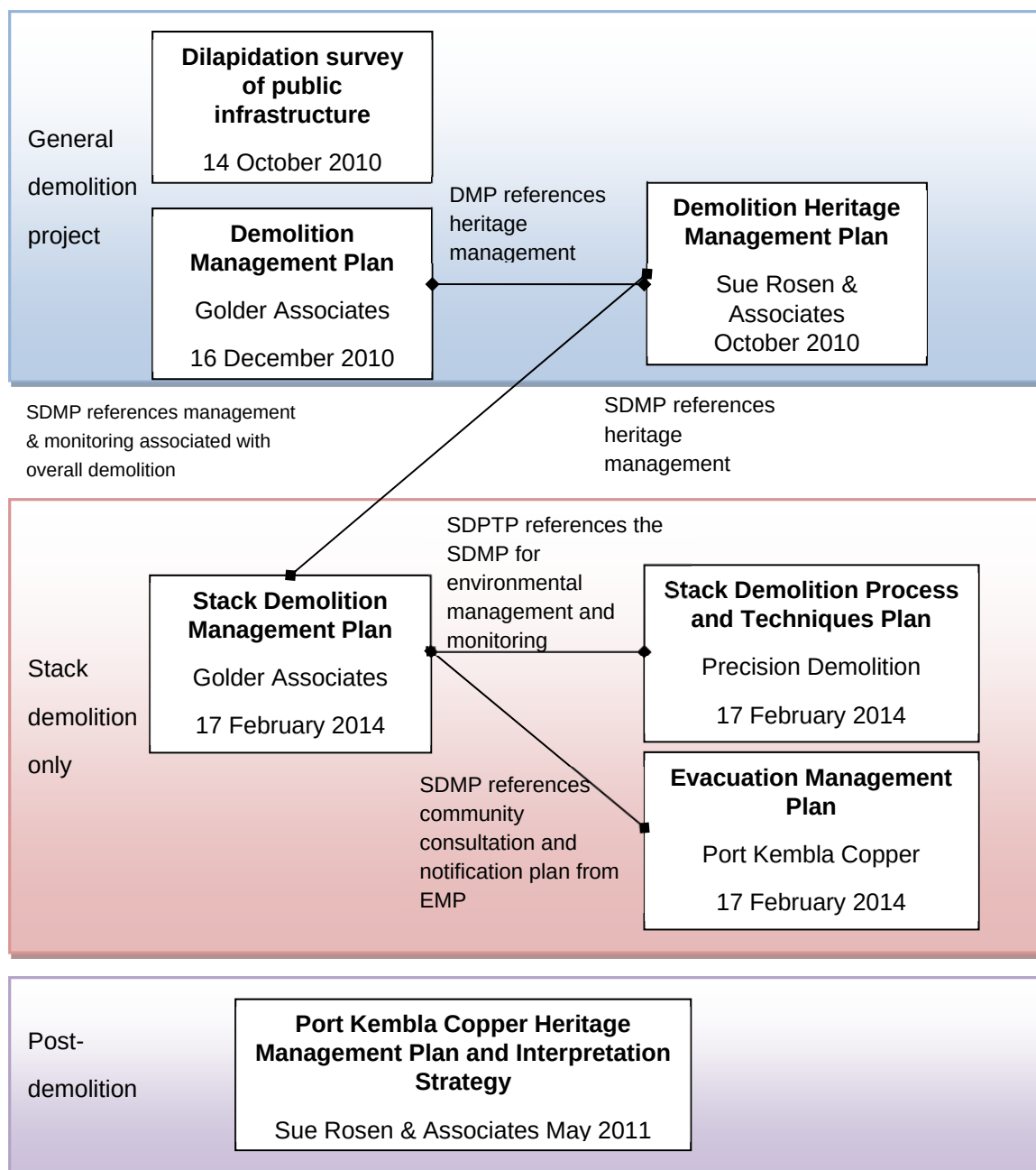
- DMP (Golder, 16 December 2010) (DMP).
- Stack Demolition Process and Techniques Plan (Precision Demolition, 17 February 2014) (SDPTP).
- Evacuation Management Plan (PKC, 17 February 2014) (EMP).



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- Port Kembla Copper Heritage Management Plan and Interpretation Strategy (Sue Rosen & Associates, May 2011).
- Port Kembla Copper Heritage Management Plan and Interpretation Strategy (Sue Rosen & Associates, May 2011).
- Dilapidation Report on the Public Infrastructure in the vicinity of Port Kembla Copper Refinery Military Road Port Kembla (Formmen Pty Ltd, 14 October 2010).

The DMP (Golder, 16 December 2010) is attached in Appendix A, given the reliance and relationship between it and this SDMP. The relationship with the other plans is depicted in the following flow diagram (below). It is noted that the SDPTP (Precision Demolition, 17 February 2014) has not been appended due to its commercially confidential nature.





The structure of the SDMP has been based on *Guideline for Preparation of Environmental Management Plans, Department of Planning (2004)*.

The SDMP was prepared by highly experienced environmental and air quality scientists familiar with the site and with experience in like projects. The SDMP was also reviewed by a Golder public health expert with more than 20 years of experience working for the South Australian Department of Health.

2.0 SITE DESCRIPTION

2.1 General

The site is situated on Military Road in Port Kembla, NSW, and is bound by:

- North - Darcy Road, beyond which is industrial land and Port Kembla Outer Harbour.
- South - Electrolytic Street and Military Road, beyond which is the former Port Kembla Public Primary School (PKC owned land) and commercial and residential areas of Port Kembla.
- East – Metals Manufacturers (MM), beyond which is Gloucester Boulevard and the Pacific Ocean.
- West – Port Kembla Police Station and Court House, Old Port Road and Darcy Road.

Schools local to the site include the following:

- Port Kembla Preschool, located approximately 150 south of the stack on Military Road.
- Port Kembla Public School, located approximately 700 m south east of the stack on Gloucester Boulevard.
- St. Patrick's Catholic Primary School, located approximately 350 m south west of the stack on Kembla Street.

The location of the site and surrounding general land uses are illustrated in Figure 1.

The site is situated on Lot 21, Deposited Plan (DP) 546139 and Lot 127 DP 257531 and is zoned 4B (Industrial – Heavy). PKC also owns the adjoining Lot 22 DP546139. There are no demolition activities to be carried out in Lot 22.

2.2 Site Layout

The layout of Lot 21, including the names and locations of current and former buildings and infrastructure, is illustrated in Figure 2. The following structures on Lot 21 are required to be retained and shall not be demolished:

- Water Treatment Plant (WTP) and pits - the WTP is used to treat “first flush storm water” (equivalent to the first 10 mm of rain falling on the site during a rain event) captured on site and directed to the holding pits located adjacent the plant. The treated stormwater from the WTP is discharged to a local storm water culvert under licence conditions prescribed in the EPL for the site (no. 1753). The WTP and associated pits will remain operational throughout the demolition project to capture and treat potentially contaminated stormwater and rinsates.
- Old Assay Office – the Old Assay Office is located along the south western boundary of the site and has been assessed to have heritage significance. Consequently, this structure will not be demolished and has been used as PKC's main office during the course of demolition.
- Precious Metals Stack – the Precious Metals Stack is located along the central portion of the northern boundary of Lot 21 (bordering Lot 22). It has been assessed as having heritage significance and therefore will not be demolished.



- Groundwater extraction and monitoring wells – some of these are required to be retained as part of the ongoing monitoring which forms part of the Maintenance of Remediation Notice (Section 28 Notice) (DEC, 11 October 2007) currently placed on the site. These wells are required to be protected and if damaged, are to be properly decommissioned and replaced.

At the time of the stack demolition, the following buildings remain on site:

- Refinery.
- Main Store.
- Blending Shed.
- Bulk Concentrate Store.
- Engineering Store

The locations of the heritage structures and monitoring wells in Lot 21 required to be retained, and the other buildings which currently remain on site are illustrated in Figure 2.

3.0 PROJECT DESCRIPTION

The overall approach and scope of demolition activities at the site are described in the DMP (Golder, 16 December 2010) and the approach to demolition of the stack is described in the SDPTP (Precision Demolition, 17 February 2014). Specific or additional management and monitoring tasks for demolition of the stack (i.e. not included or described in detail in DMP (Golder, 16 December 2010)) include the following:

- Stakeholder Engagement and Reporting
- Environmental Risk Assessment.
- Air Quality Management Plan.
- Noise and Vibration Management Plan.
- Traffic Management Plan.
- Heritage Management Plan.

The following sections describe the assessment, management, monitoring and (as appropriate) contingency measures relevant to each of the above items. Also included in the SDMP are the following:

- Stack demolition management structure and responsibilities.
- Relevant legislation and regulations
- Training details.
- Emergency contacts.

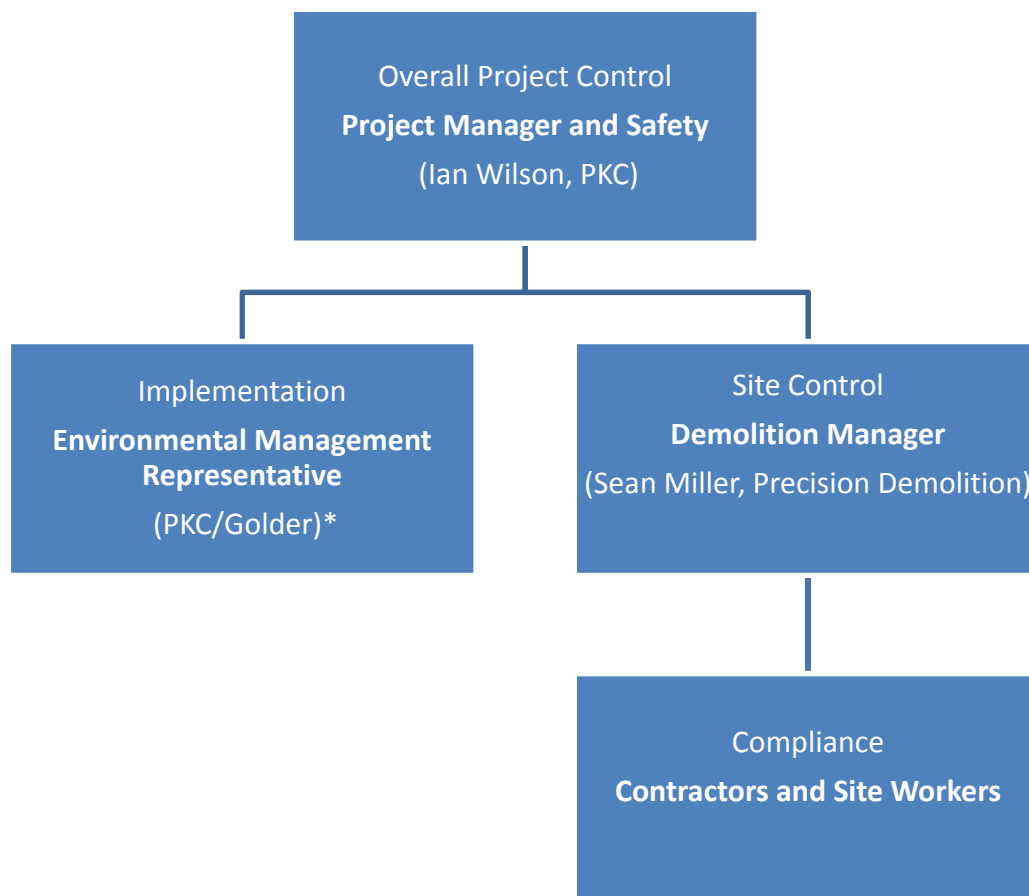
Supplementary information on soil, water and waste management requested by EPA (22 August 2013, 30 September 2013, 6 December 2014 and 5 February 2014) and DPI (26 August 2013 and 14 December 2014).



3.1 Demolition Management Structure and Responsibility

This section describes the management structure for the demolition works and how implementation of this SDMP is to fit into that structure. The figure below presents a structure/flowchart for the demolition management structure and the position of the Environmental Management Representative (EMR), who is the principal administrator of the SDMP.

Management Structure for SDMP Implementation



*Environmental management, monitoring and contingency measures have been developed by Golder and will be implemented by PKC.

Overall project control and responsibility for compliance with the SDMP belongs to the PKC Project Manager (Ian Wilson), whilst the Demolition Manager (Sean Miller of Precision Demolition) has control of site during demolition. The PKC Project Manager and Demolition Manager will work with the EMR (PKC/Golder) to implement all aspects of this SDMP. The role of the EMR includes practical implementation and maintenance of this SDMP, organisation of compliance monitoring, documentation, development of corrective actions, reporting, review and amendment of the SDMP, as required.



3.2 Legislation and Regulation

Activities associated with the demolition must comply with relevant legislation and regulations. Appendix B provides a list of environmental legislation and Australian Standards that may apply to demolition of the stack. Standards associated with physical demolition of the stack are provided in the SDPTP (Precision Demolition, 17 February 2014) and in Appendix B.

Table 1 below presents a list of legislation (and regulators) relevant to the Project along with licenses, approvals and permits that may be required. Table 1 also identifies the person responsible for ongoing compliance monitoring.

Table 1: Regulatory Compliance Requirements

Regulatory Instrument	Licence/Permit/Approval/ Guideline/Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>Environmental Planning and Assessment Act 1979</i>	SDMP to comply with Project Approval conditions for demolition (MP_08_0191) under Part 3A the of EP&A Act	Department of Planning and Infrastructure	PKC Project Manager and EMR	Obligations within the EA and DMP	This SDMP is based upon the <i>Guidelines for the Preparation of Environmental Management Plans</i> . Content based upon Project Approval Conditions prepared by Director-General
<i>Heritage Act 1977</i>	Two items listed by Heritage Branch are Assay Office and Precious Metals Stack. These items are not to be disturbed by the demolition works	Heritage Division of the Office of Environment and Heritage	EMR	N/A	N/A



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Regulatory Instrument	Licence/Permit/Approval/ Guideline/Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>Threatened Species Conservation Act 1995</i>	PKC to prepare a Green and Golden Bell Frog Management Plan in coordination with NPWS which outlines management during and following the demolition works	National Parks and Wildlife Service	EMR	N/A	N/A
<i>Protection of the Environment (Operations) Act 1997</i>	The Site has an operational Environmental Protection Licence (no. 1753) which was varied to incorporate the demolition works	NSW EPA	Project Manager and EMR	Consistent with EPL (no. 1753)	Consistent with EPL (no. 1753)
<i>Water Management Act 2000</i>	Provisions for the licensing, allocation, capture and use of water resources.	NSW Office of Water	EMR		
<i>Contaminated Land Management Act 1997</i>	Remediation works completed under Former Voluntary Remediation Agreement (no. 26027). Demolition undertaken cognisant of past contamination issues, including retention of monitoring well network associated with Current Maintenance of Remediation Notice no. 28033.	NSW EPA	Project Manager, EMR	As detailed in Maintenance Remediation Notice	As detailed in Maintenance of Remediation Notice
<i>Environmentally Hazardous Chemicals Act 1985</i>	Management of chemicals required to be consistent with the Chemical Control Order for Scheduled Wastes (2004)	NSW EPA	EMR	N/A	N/A



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Regulatory Instrument	Licence/Permit/Approval/ Guideline/Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>Work, Health and Safety Regulation 2011</i>	Demolition and asbestos removal works to be completed in accordance with relevant codes of practice approved under section 274 of the WHS Act. WHS Reg 2011 provides for licensing of asbestos removal work. It also specifies when notification to WorkCover NSW of asbestos work is required.	WorkCover NSW	Project Manager	N/A	N/A
<i>Waste Avoidance and Resource Recovery Act 2001</i>	Waste Management Plan, as presented in Section 5.2.6 of DMP.	NSW EPA	EMR	N/A	N/A

Notes:

EA - Port Kembla Copper Pty Ltd, 8 April 2009. Port Kembla Copper Site Demolition Project: Preparation for Future Use



3.3 Reporting and Stakeholder Consultation

3.3.1 Background

An Environmental Assessment (PKC, 8 April 2009) for site demolition was submitted to the (then) Department of Planning as a final document. This document detailed the regulatory and environmental issues and potential mitigation options available for the management of these issues during and after the demolition works. As part of the pre-planning stage and the EA, the following stakeholders were consulted:

- Landholders and community;
- Local businesses and service providers;
- EPA (then Department of Environment and Climate Change);
- WCC;
- Roads and Traffic Authority;
- Office of Water (then Department of Water and Energy); and
- Port Kembla Port Corporation.

DPI was also consulted (through submission of the EA and ongoing liaison) and they provided their Project Approval requirements as a result (Application No. 08_0191, 15 August 2010).

3.3.2 Consultation During Demolition

3.3.2.1 General Demolition Activities

The following community consultation has taken place during the course of the last two years of general demolition at the site.

Community Consultation

PKC has regularly consulted with the Port Kembla Copper Community Liaison Group (CLG) in relation to the site demolition and other environmental issues associated with PKC. These meetings have generally been carried out on a monthly basis, with minutes of meetings distributed to all attendees and the following:

- Attendees (including those who have attended infrequently or rarely)
- The Principals of the two schools listed in Section 2.1.
- DPI (Chris Ritchie).
- EPA (regular attendee).
- WCC (regular attendee).

Recent monthly meetings have included discussion on the timing and approaches to the demolition of the stack.

Regulatory Consultation

Consistent with the requirements of the EA (PKC, 8 April 2009) and the DMP (Golder, 16 December 2010), the following regulatory reporting and consultation has been conducted during the course of general site demolition:



- Monthly environmental monitoring reports have been prepared and issued to EPA, DPI and WCC, documenting general progress of demolition, the results of air, noise and water monitoring and compliance with the Project Approval conditions.
- Non-compliance notifications and reports have been issued to EPA following detection of results which are greater than the Project Approval and EPL (no. 1753) limits or screening criteria nominated for the demolition project.

Annual return reports for EPL (no. 1753) for the last two years have also included the results of environmental monitoring completed to assess potential impacts associated with demolition activities.

3.3.2.2 Consultation for Stack Demolition

Approaches and Schedules

The consultation regarding the stack demolition has focused on minimising disruption to the community and is described in the EMP (PKC, 17 February 2014). Examples of the communication undertaken by PKC in relation to the stack are provided below.

Communications with Media

01/08/13 – Media Release – advising change of demolition of stack as 6 Sep 2013
12/08/13 – Media Release – date for planned demolition of stack changed to 5 Sep 2013
22/08/13 – Media Release – stack demolition has been 'paused'
28/08/13 – Media Release – new date planned to be set in next few weeks
17/10/13 – Media Release – have your say on stack arrangements
18/12/13 – Media Release – February 20 date announced
28/01/14 – Media Release – metro media alerted to February 20 date
30/01/14 – Media Release – Channel Seven report correction
07/02/14 – Media Release – details of mullite
10/02/14 – Media Release – second Channel Seven report correction
11/02/14 – Media Release – preparations are on track

Communication – Properties within Exclusion Zone

01/08/13 – Letter – relocation during felling of stack on 6 Sep 2013
7/08/13 – Letter – arrangements for Stack Demolition Day
13/08/13 – Letter – date changed to 5 Sep 2013 – also advise of Information Session on 15 Aug 2013
19/08/13 – Letter – information about Dilapidation Surveys
23/08/13 – Letter – stack demolition delayed
17/10/13 – Letter – new properties in the Exclusion Zone
17/10/13 – Letter – establishment of Information Centre
24/10/13 – Brochure – health precautions advice
28/10/13 – Letter – to properties where owners haven't been at home
05/11/13 – Letter – offer of dilapidation surveys
18/12/13 – Letter – February 20 date announced
31/01/14 – Letter – pet accommodation arrangements
11/02/14 – Brochure – health information
11/02/14 – Brochure – management of dust

Communication – Majority of Properties in '2505' Post Code

31/07/13 – Letter – advise stack demolition date set 6 Sep 2013
13/08/13 – Letter – date changed to 5 Sep 2013 – also advise of Information Session on 15 Aug 2013
16/10/13 – Poster – establishment of Information Centre
18/12/13 – Advertisement – February 20 date announced
18/12/13 – Letter – February 20 date announced



Communication – Road Access – Electrolytic Street and Marne Street

20/08/13 – Letter – advising residents who are outside Exclusion Zone but who will be unable to access properties by road because of road closures Communications with Media

1/08/13 – Media Release – advising change of demolition of stack as 6 Sep 2013

12/08/13 – Media Release – date for planned demolition of stack changed to 5 Sep 2013

22/08/13 – Media Release – stack demolition has been 'paused'

Requests for information and questions raised during the meetings with the community (including those of PKC community information session of 15 August 2013 and the Port Kembla Pollution Meeting 7 September 2013) have been taken into consideration in preparing this document. These include:

- The potential for generation of and impacts from harmful dusts (including asbestos).
- The potential for property damage resulting from the demolition and the need for dilapidation surveys.

These issues were already being addressed by PKC in accordance with its obligations under the Project Approval and the EPL (No. 1753).

Specific consultation has taken also place with the Government agencies for the stack demolition event. A summary of some of the consultation with the regulatory agencies for the stack is attached in Appendix C.

Future consultation associated with the stack demolition will also include the following:

- Media releases.
- Letter drops.
- Personal home visits.

A media strategy commissioned by PKC for the consultation process leading up to the demolition of the stack is attached in Appendix H. This incorporates the need to communicate with non-English speakers who are known to reside in Port Kembla and the surrounding suburbs.

Outside of the above forms of consultation, the public has been invited to contact PKC by phone, email or letter. The relevant contact details are provided at www.stackinfo.com.au.

Dilapidation Surveys

Dilapidation surveys of public roads, footpaths and gutters were commissioned by PKC and provided to DPI and WCC (Formmen Pty Ltd, 14 October 2010). Dilapidation surveys will be conducted on completion of demolition activities at the site to assess the potential impacts demolition has had on the relevant public infrastructure.

PKC has also offered to conduct dilapidation surveys of all private properties located within the revised Exclusion Zone (ie 300 m radius from the base of the stack). All property owners requesting surveys will have their properties assessed by 17 February 2014, with the reports provided to the owners prior to demolition of the stack.

As required by the project approval, damage to public roads, gutters and footpaths and private property caused by the stack demolition (or other demolition at the site) will be made good by PKC.

Complaints Handling, Investigation and Resolution

The approach to handling, investigating and resolving complaints associated with the stack demolition will be as per that outlined in DMP (Golder, 16 December 2010). The public should contact PKC on 1 800 688 587 if it has any questions or complaints in relation to impacts from the stack demolition. PKC will make every effort to address and make good any impacts associated with the activity.



If there is a dispute in relation to claims of damage or dust impacts, as requested by DPI (14 December 2013), an independent Dispute Resolution Panel (consisting of an air quality scientist, structural engineer and builder) has been appointed to resolve such disputes between PKC and local residents or business owners. The panel members have had no previous involvement with the stack demolition planning, and their appointment has been reviewed and approved by DPI. The panel members will be provided with the relevant demolition planning documents for review and be in attendance on the day of demolition. The local community should contact DPI 1 300 305 695 to organise the services of the Dispute Resolution Panel. This is a message service, and therefore persons' names, address, contact details and nature of the dispute should be included in the message.

3.3.3 Non-Compliance Reporting and Resolution

The approach and process for recording, notifying, investigating and addressing non-compliances (monitoring results which do not comply with the limits detailed in the Project Approval and EPL no 1753) will be:

- As per that outlined in the DMP (Golder, 16 December 2010).
- Consistent with that undertaken since the commencement of demolition at the site.

3.4 Training

All employees involved in the stack demolition shall undergo training regarding their responsibilities under the SDMP and associated plans listed in Section 1.0. The training will be developed to provide staff with the key obligations outlined in the various plans prepared for the stack demolition. It should be noted that "employees" in this instance means all people working on-site including tenants, contractors and sub-contractors.

The training programme will incorporate the following:

- A general site induction.
- Familiarisation with the requirements of the various plans.
- Environmental emergency response training, including spill management/response procedures.
- Familiarisation with site environmental controls (bund areas, spill kit locations, emergency gas valves, shut-off points etc).
- Protection and maintenance of heritage structures.
- Targeted environmental training for specific personnel. For example, the staff assisting Golder in relation to environmental monitoring may need training in the operation and calibration of monitoring equipment.

As part of the environmental training for the stack demolition, staff will be required to sit and pass a test aimed at assessing their understanding of their obligations during the event.

The test papers and results will be retained by PKC.

Roles and responsibilities for individual PKC staff and contractors have been assigned to ensure the activities required to be completed under the SDMP are completed effectively and efficiently.



3.5 Emergency Contacts and Response

The following provides the contact details for the stack demolition project team and relevant stakeholders.

The area also provided in the EMP (PKC, 17 February 2014)

Table 2: Emergency Contacts

Agency/Organisation	Name	Phone
Project Team	Project Manager – Ian Wilson	0419 612 305
	H&S Management Representative – Mike Jim Bailey	(02) 4275 0200
	Community Liaison Manager – Ian Wilson	0419 612 305
	Environmental Management – Graeme Miller	0458 598 671
Department of Planning and Infrastructure	Head Office	(02) 9228 6111
EPA	Wollongong Office Environment Line	(02) 4224 4100 131 555
Wollongong City Council	General Enquiries	(02) 4227 7111
Police, Fire and Ambulance	Emergencies	000
Sydney Water Corporation	Emergencies	13 20 90
Endeavour Energy (power lines)	Emergencies	131 003
Jemena Gas Network	Emergencies	131 909
Port Kembla Public School	Mr Kevin Tucker – Principal	(02) 4274 1041
St Patrick's Catholic Primary School	Ms Anne Duggan – Principal	(02) 4275 5500

The notification procedures for an emergency situation are detailed in the Contingency Plan section SDPTP (Precision Demolition, 17 February 2014).

4.0 IMPLEMENTATION

4.1 Risk Assessment

The assessment of potential risks is essential to manage various aspects of the stack demolition which have the potential to create adverse impacts to surrounding human and environmental receptors. The main steps involved in a risk analysis are: incident identification, consequence analysis, probability and frequency estimations, and lastly a quantitative risk assessment. The first three steps are considered in this SDMP.

The potential environmental risks and management measures for the stack demolition works at the Port Kembla Copper site are discussed in the following sections. Demolition of the stack will consist of felling using explosives (refer to SDPTP (Precision Demolition, 17 February 2014)) with subsequent recovery or disposal of materials on-site and off-site. Table 3 (below) lists the environmental aspects associated with the stack demolition activities, and the potential environmental impacts identified. The potential risks have been rated from low to very high in accordance with the methodology outlined in the Australian Standard AS4360:2004 Risk Management (AS4360) and HB436:2004 Risk Management Guidelines Companion to AS4360:2004 (HB436).



The environmental risks have been classified by the matrix method outlined in HB436, whereby the likelihood and consequence of a risk are identified to produce a level of risk rating. The consequence and likelihood of an event is measured on a qualitative scale using Table 6.2, 6.3 and 6.4 in HB436. The level of risk of an event is then determined by combining the likelihood and consequence of an event, as detailed in Table 6.6 in HB436. This approach allows the potentially significant risks to be determined and assessed further.

Table 3 presents the risk rating of the stack in an unmanaged scenario is shown, as well as the modified risk rating by undertaking the activities using standard safety, environment and management practices. These activities are described in Sections 4.2.1 – 4.2.6.



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Table 3 Potential risks from stack demolition

Aspect	Activity	Impact	Original Risk Rating	Managed Risk Rating
Hazard and safety	Various demolition activities and structures	Serious injury or death of site workers and surrounding land users and occupants	High	Low
Air emissions	- Felling of large structures - Size reduction and sorting of demolition materials	- Potential release of dust into the atmosphere - Potential impacts on air quality, physical amenity and stormwater (through deposition)	High	Low
Noise and vibration	- Felling of large structures - Size reduction and sorting of demolition materials	- Intrusive noise experienced off-site for the short periods of activity - Vibrations damaging off-site structures	Medium	Medium
Traffic and transport	- Moving dismantled equipment around the site for packing and consolidation before despatch - Transport of materials off site	- Spillage of material during transport impacting on stormwater or soil - Impact on road network and road safety	Medium	Low
Wastewater	- Washing down structures and equipment - Washing recovered scrap - Water used for dust suppression	Generation and release of contaminated wastewater from the site	Medium	Low
Generation of waste	- Disposal of lubricants - Disposal of materials not able to be recycled - Disposal of hazardous building materials	- Potential for soil and groundwater contamination - Disposal of solid waste to landfill	Medium	Low
Soil	- Felling of large structures - Transport and disposal of materials from demolition activities	Exposure of demolition personnel to the soil contamination present at the site	Medium	Low
Water usage	Consumption during washing down and dust suppression	- Use of potable water resources. - Use of treated water from the WTP	Low	Low



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Energy and greenhouse	- Size reduction and sorting by mechanical means - Transport of materials off site	- Energy consuming implements and equipment - Greenhouse gas emissions from consumption of fossil fuels	Low	Low
Visual amenity	- Removal of site structures - Demolition works	Probable overall improvement in visual amenity	Low	Low
Socio - economic	All demolition related activities	- Temporary increase in local employment - Potential for industrial renewal	Low	Low
Cumulative impacts	- Dismantling and removal of site structures, plant and equipment - Transport, size reduction, sorting and disposal of demolition materials	Potential combined impacts on the community and environment from the demolition works and neighbouring industries	Low	Low

Note: management of Hazard and Safety is addressed in SDPTP (Precision Demolition, 17 February 2014) and the EMP (PKC, 17 February 2014), as they describe the methodologies and management measures to be applied to demolition of the stack.



4.2 Demolition Management Activities and Controls

4.2.1 Air Quality Management Plan

General Obligation and Commitment

The site will be maintained in a condition (prior to, during and following demolition of the stack) which minimises the emission of dust, consistent with:

- EPL (no. 1753)
 - *Section O3.1 – The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.*
 - *Section O3.2 – Activities in or on the premises must be carried out in a manner that will minimise the generation, or emission from the premises, of wind blown or traffic generated dust.*
- Project Approval
 - *Section 14 – The Air Quality Management Plan must include an air quality monitoring protocol, including project specific air quality limits/goals and management measures to address any exceedences and to suppress any dust generation.*
 - *Section 22 -The Proponent shall carry out all reasonable and feasible measures to minimise dust generated by the project.*

This includes the measures outlined in DMP (Golder, 16 December 2010), as well as the additional actions described in the following sections of this document. The stack demolition will be conducted and managed to minimise the generation, or emission of dust from the site. This includes dust from the stack felling, as well as subsequent breaking up and movement of demolition waste from the impact zone. The key elements of this management plan include:

- The potential (air quality) risks associated with the demolition of the stack.
- How these risks will be managed and mitigated.
- The monitoring applied to assess the effectiveness and impacts (if any) to local air quality resulting from the demolition of the stack and the resultant potential environmental distribution of air-borne matter from the site.

Associated Risks

General

The demolition of the stack may result in the disturbance and release of dust – from the structure itself, as well as from the ground surface in the impact zone. Accordingly, management of dust emissions is required to mitigate the potential for health and amenity impacts from dust generated by the stack demolition.

To assess the potential for dust/air quality issues and risks resulting from the stack demolition, assessments have been conducted in relation to:

- The chemical nature of the stack materials, including the concentrations of metals, the potential for asbestos to be present, and the assessment for other potential chemicals or constituent of interest including mullite, dioxin and furans and Technologically Enhanced Naturally Occurring Radioactive Materials (TENORMS).
- The construction and total weight of the stack, and what portion of the structure may have been exposed/impacted by emissions.



- Nature of the emissions passing through the stack (and their evolution during passage up the stack).
- Visual assessments of the internal portions of the stack (i.e. the portion exposed to emissions).
- Records of stack cleaning.

Assessment Results

PKC, Precision Demolition, Golder, EPA and WorkCover NSW recently completed sampling and analysis of bricks, concrete, mortar and Flintkote seals from the stack structure to assess the presence of asbestos and concentrations of metals of interest in the internal sections of the stack. The approach and methodology applied to the assessment conducted by Golder was developed in consultation with EPA, described in Golder work plan (23 September 2013) and Golder (23 and 25 September 2013), and consisted of sampling and analysis of the following:

- Whole bricks exposed to emissions which previously passed through the stack.
- Whole bricks within the stack but which were not exposed to emissions.
- Residue scraped from the surface of bricks exposed to the emissions.

The results of these analyses are presented in Tables 1 – 4 (Appendix E), with Table 4 detailing a comparison of the average concentrations of the metals of interest. The results of these analyses report the following:

- Asbestos was not detected in any of the samples, which is consistent with previous sampling completed by Precision Demolition (attached in Appendix E) and sampling of the external stack concrete structure recently completed by WorkCover NSW (27 September 2013).
- The concentrations of the majority of the metals were similar in the whole bricks exposed to emissions and those not exposed to emissions – indicating the mass of contaminants in residues adhered to bricks is considered to be very limited relative to the mass of the stack.
- The concentrations of arsenic, copper, lead and selenium were one order of magnitude (or more) higher in residues removed from the brick surface compared to those reported in the whole bricks. The residue was scraped from the brick using a non-metallic device and was reported by the laboratory to be very difficult to remove (the laboratory ultimately chipped off the stained face of the brick since scraping did not generate sufficient sample volume for analysis).
- The average concentrations of metals within the bricks and residue sampled by Golder are similar to those reported by PKC (refer to Table 5 in Appendix E). The residues and bricks sampled by Golder were from the lower portions of the stack (Levels 2 and 4), whilst those sampled by PKC were obtained from lower and higher in the stack (Levels 1, 6, 15, 18 and 21). This suggests that the quality of the bricks and minor amounts of residue present on the bricks appears to be consistent across different levels in the stack.

The results of other assessments carried out on the condition of the stack include the following:

- Mullite was detected in two of 10 bricks collected by EPA. Mullite has not been evaluated as a carcinogen by the International Agency for Research on Cancer (IARC) and is only known to cause lung conditions after prolonged exposure to high concentrations of this mineral – a scenario that is not relevant to the stack demolition due to the short term nature of the activity, and the management measures and cleanup protocol being applied to the project (refer to following sections).
- A review by ANSTO in October 2000 – March 2003 and testing of individual bricks commissioned by EPA found that the stack does not represent a source of radioactivity above that in ordinary building materials.



- An assessment conducted in 2001 and reviewed by EPA demonstrated that the site did not represent a source of dioxins and furans (which are dioxin-like compounds) during its operating period. Regardless, bricks exposed to emissions have been submitted for analysis, with the results to be made available to the community and regulators prior to demolition.

Relevant documentation on TENORMS is attached in Appendix I.

Information provided by PKC on the nature of the emissions which passed through the stack indicated the following:

- The mass of metals and sulfur passing through the stack during operation by PKC was much reduced compared to that during Southern Copper and ER&S ownership periods due to:
 - Smelter gas being directed to the Sulfuric Acid Plant (with only ventilation gas passing up the main stack).
 - Improvements to the main stack bag house.
 - Injection of lime to treat the emissions prior to release up the main stack.
- PKC indicated that there was the potential for more accumulation of residues near the top of the stack due to the effects of vapour temperature reductions. However, based on the analysis of the residues collected by PKC and Golder (refer above), the chemistry and concentrations of metals within the residues appears to be similar near the base and top of the stack.

As detailed in Section 4.2.6 (below), the stack is constructed of an outer concrete weather shield (and second (internal) concrete structural stack) which surrounds an internal brick chimney. The vast majority of the stack (greater than 99%) would not have been exposed to emissions – indicating the potential mass of metal residues adhered to the internal element of the stack is considered to be low. This is supported by the whole brick sample analytical results (refer above), as well as visual evidence (refer to Appendix D) indicating limited amounts of residue adhered to the bricks at different levels within the internal part of the stack. The general absence of scale or thick accumulations of residues within the stack may be attributed to the most recent operating conditions of the stack (refer above) and wash downs of the internal portion of the stack completed by PKC in September 2002 and July 2003, and during asbestos removal and other decommissioning works conducted in 2013. There are no data available on the quality of the effluent water or sediment from the wash downs.

Further wash downs or application of tackifier to the internal portion of the stack are not possible due to the dismantling of the water supply to the stack and health and safety issues with entering the stack. These health and safety issues are associated with:

- The removal of sections of bricks and insertion of temporary props to allow removal of gaskets which contained asbestos.
- The drilling of 934 holes at the base of the stack to allow placement of explosives and to weaken the structure to facilitate the felling.
- The inability to perform rescues of staff who may become injured or trapped while working within the stack structure.

Assessment Outcomes

On the basis of the assessments completed by Golder and others, the following is concluded:

- The mass of metal contaminants within the stack residue is considered to be very low, with the concentrations of the majority of metals of interest similar in bricks exposed to emissions and those not exposed to emissions. These concentrations are also lower than the National Environment Protection (Assessment of Site Contamination) Measure Health Investigation Level A (NEPM HIL A), (NEPC 1999, as amended 2013) for soil in a residential setting. That is the quality of dust expect to be generated



from demolition – if deposited beyond the site boundaries - would not pose a risk to surrounding residents and occupants, including small children, adults and workers in short and long term exposure scenarios (even if they were to live on the land for a lifetime).

- The amount of residue within the internal surface of the stack is very limited and strongly adhered to the surface of the bricks, indicating discrete liberation of this material on demolition is expected to be limited. The baked-on (strongly bonded) nature of the residues also indicates it is likely to have limited bioavailability; i.e if ingested will have limited uptake into the bloodstream.
- Gaskets containing asbestos, along with adjacent brick and mortar, were removed by Precision Demolition - as verified by an independent occupational hygienist. Furthermore, samples of brick, concrete and mortar collected by PKC and others (following removal of the asbestos gaskets and mortar and brick in contact with the gaskets) from other parts of the stack did not contain asbestos. Testing of Flintkote sealant present in the stack also indicated this material does not contain asbestos, and therefore generation of asbestos dust as a consequence of the stack demolition is considered unlikely.
- TENORMS are at levels representative of background concentrations, whilst the presence of mullite (not a listed carcinogen by IARC) is not considered to pose a risk to the local community based on the short term exposure potential and management measures being employed which will mitigate that potential (refer to following sections).
- The site was not considered to pose an exposure source for dioxins and furans in a study completed in 2001 (a conclusion accepted by EPA), with sampling commissioned to confirm this conclusion to be completed prior to demolition.

Advice from the demolition contractor reported that the outer shell of the stack (which was not exposed to emissions) will effectively collapse and envelop the internal brick lining. This, in conjunction with the management measures described in the following section, will mitigate the potential for residual stack dusts from the internal walls of the stack (as well as general dust generated by the felling of the structure) to become airborne and impact on local air and soil quality.

Management Measures

This section describes the management measures to be applied during and immediately after demolition of the stack. Controls associated with managing air quality and odour (if relevant) during the subsequent breaking up, crushing and transport of the stack are addressed in the DMP (Golder, 16 December 2010) and in Section 4.2.6 of this report.

Specific management measures applied to the stack demolition will include the following:

- Impact zone - the area of the site where the stack is proposed to fall has been sealed with concrete, bitumen or a temporary (Petrotac) sealant (used as a final coat on compacted road base and to be re-applied prior to demolition in select areas). Sealed areas will be thoroughly swept, cleaned and wet down immediately prior to demolition (refer to following bullet in relation to mechanisms used for wetting down). The potential for generation of ground dust following impact is therefore considered to be limited.
- Wetting down of stack during demolition – a combination of water cannons and long cast sprinklers will be directed at the stack impact zone two hours prior to, during and at least two hours following demolition to minimise dust generation. The spray network is illustrated in Figure 4 (attached) and has been developed based on the following parameters:
 - The area created by a 20 degree arc about the fall line – the location of the fall line and the 20 degree arc prescribed by Australian Standard 2601-2001 is shown in Figure 4 and represents the area of the site which will be subjected to thorough cleaning and wetting down prior to and during demolition of the stack.



- Point sources of dust release – discrete locations where dust from the internal portions of the stack may be released include the following, and will therefore be the target of specific wetting down measures:
 - The base of the stack where charges will be set.
 - The top of the stack (although emissions are likely to be mitigated through the presence of the steel end cap).
 - Where the stack falls across the (three) terraces along the impact zone.
- Proximity of sensitive receptors – which are located to the south east to south west of the site. Accordingly, a greater density of dust suppression devices has been allowed for this area.
- The specifications for the dust suppression devices proposed to be used prior to, during and following stack demolition within the impact zone have been extensively used for suppression of dust generation at demolition sites and include :
 - 6 x Dust Boss DB-60 units, which are capable of casting 60 m of fine water sprays. These units are powered by a generator, mounted on a tripod with wheels (allowing easy movement and repositioning), and self-pivot across a 70 degree arc (allowing coverage of an areas of approximately 2,000 m²). The angle of the units can also be adjusted. The DB-60 units are intended to provide general management of dust across the broader impact zone, and are therefore proposed to be evenly spaced along the boundary of the 20 degree arc. The units will be secured in the selected positions using jacks and sand bags. Protective fencing will also be placed in front of the units to protect them from damage/loose demolition material, and rubble placed over the water supply lines (also for protection from damage and to secure ongoing water supply). Specifications (including flow rate requirements) for the Dust Boss DB-60 unit are attached in Appendix F. The final locations and orientation of the Dust Boss DB-60 units applied on the day of demolition will be based on the learnings from the trials conducted in the lead up to demolition and the weather conditions at the time of demolition. EPA, DPI, WorkCover NSW, WCC and the community have been in attendance at one or more of the trials.

The Dust Boss DB 60 units are powered by stand-alone generators and therefore do not rely on mains power – avoiding the potential for system failure in the case that electrical supply to the site is lost. The generators will be shielded by existing structures or shipping containers to avoid damage from large demolition material.
 - A minimum of 7 x Nelson Big Gun 100 sprinklers (with another three similar sprinklers to be added to the network for the day of demolition) , which when fitted with a Taper Ring or Taper Bore Nozzle are capable of spraying a heavy water droplet a distance of up to 50 m (depending on water pressure/supply and nozzle size and type). For the purpose of planning the sprinkler network for the stack demolition, a 30 m spray distance for each sprinkler has been assumed. The Nelson big Gun 100 sprinklers will be mounted on steel tripods (weighed down using 20 kg bags of sand to prevent movement from the selected positions) and can be set to pivot through a range of arcs. The actual arc set for the individual sprinklers will be based on the learnings from field trials and the weather on the day of demolition, but are likely to be relatively limited (less than 60 degrees) to allow concentration of water at the potential point sources of dust release described above. The specifications (including flow rate requirements) for the Nelson Big Gun 100 sprinklers are attached in Appendix F.
 - In preparation for demolition and dust suppression trials, PKC engaged plumbing contractors to:
 - Assess the capacity of the mains water to supply the complete dust suppression network (as described above) at full operating capacity (flow and pressure requirements as described in the unit specifications in Appendix F).



- Fit appropriate diameter piping and joiners (fittings) to the proposed water supply points to allow connection to the Dust Boss and Nelson Big Gun units.
- Asbestos removal – 21 asbestos containing gaskets and bricks and mortar in contact with the gaskets were removed from the 23 levels of the stack between April and September 2013. PKC and Precision Demolition indicated the ground and top levels of the stack did not contain asbestos (or any other kind) of gaskets. A certificate verifying that all asbestos has been removed was issued by a certified independent occupation hygienist (attached in Appendix E). Tackifier was sprayed around the locations from which asbestos was removed.
- An Exclusion Zone and community consultation regarding the operation – ensuring movement of local residents and workers further from the site and informing them of the potential impacts, management and precautionary measures, and monitoring proposed for the activity.
- Damping down of stack rubble post-demolition – once felled, the rubble will be sprayed with water until crushing and removal is complete. Wetting down will be done using the approaches outlined in the DMP (Golder, 16 December 2010) and will be conducted to meet the requirements of the EPL (no. 1753) and the Project Approval (refer to *General Obligation and Commitment* section, above). As described in the DMP (Golder, 16 December 2010), crushing of stack materials may also be conducted in enclosed areas (e.g. the Bulk Concentration Store or refinery building) to mitigate dust emissions.
- Consideration of wind direction – as described in the DMP (Golder, 16 December 2010) breaking up and crushing of the materials (in this case the stack) will not be conducted on windy days, and in particular on days when strong winds are blowing towards the residential areas of Port Kembla. This approach has been applied throughout the course of demolition, with relatively few reported non-compliances related to dust generation.

PKC does not propose the use of berms placed around the periphery of the impact zone for the following reasons:

- The berms may promote the lifting of dust generated by the impact into the air.
- The Exclusion Zone is considered by Precision Demolition (SDPTP, 17 February 2014) to be protective of surrounding residents and properties and on-site heritage structures.

A berm will, however, be constructed at the northern end of the impact zone to mitigate the potential for damage to the PKC wastewater treatment plant. The berm will be constructed of coarse demolition waste and will be wet down immediately prior to demolition to mitigate potential dust generation.

It is noted that the dust suppression network (described above) has been thoroughly trialled prior to demolition, and including two trials for the regulatory working group (including officers from NSW Health) and community. The objectives of these trials were to identify:

- Any potential issues with the water supply to the site (and units), including adequacy of supply pressure and flow, and any variability in supply during operation.
- The general operation of the units, including distances and areas able to be covered, and ease of changing the location and orientation (vertical and horizontal) of the units.

The outcomes of the trials indicate the dust suppression network forms a robust and effective means of mitigating dust generation and associated potential impacts. However, additional measures including additional of three more sprinkler systems and “flooding” certain part of the site using water carts and sandbags/berms will be applied for the day of demolition.



Monitoring Program

The approach, locations and schedules for air quality monitoring for general demolition are described in the DMP (Golder, 16 December 2010). The existing monitoring network consists of the following:

- Four unattended high volume samplers (HVAS) and dust deposition gauges situated on:
 - The eastern and north-western boundaries of the site.
 - Within residential and commercial areas immediately to the south and west of the site, respectively.
- Attended dust monitoring using a Dustrak II instrument. The location of the monitoring will vary depending on the location of the demolition activity and the wind direction.

The locations of the HVAS samplers are illustrated in Figure 3 (attached) and are used to collect total suspended particles (TSP) and PM₁₀ samples over 24 hour periods. The TSP samples are also used to assess metal (arsenic, antimony, cadmium, chromium, copper, iron, lead, mercury, nickel, vanadium and zinc) concentrations in the dust. TSP and PM₁₀ samples are collected on different days by changing the sampling head).

Dust deposition samples collected data over a month, whilst attended monitoring is generally conducted over short time frames to assess potential impacts of activities and/or mitigation measures.

Specific monitoring to be applied for the demolition of the stack will include the following:

- Unattended HVAS sampling - sampling and analysis of total suspended particles (TSP), metals (arsenic, antimony, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, vanadium and zinc) and PM₁₀ will be conducted on the day prior to, the day of, and the day following stack demolition at the locations of the four (existing) boundary/near boundary high volume samplers (HVA01 - HVA04). PM_{2.5} dust samples will also be collected from locations HVA01 – HVA03, which are located in closest proximity to sensitive receptors of Port Kembla. This monitoring program will allow assessment of the magnitude and approximate duration of any air quality impacts. This approach will necessitate temporary hire of two additional HVAS samplers at each location to permit collection of all dust fractions at the same time.
- Asbestos monitoring – whilst all asbestos has been certified as having been removed from the stack, boundary monitoring of asbestos will be conducted on the boundaries of the site bordering the residential areas on the day of, the day prior to, and the day following stack demolition. Monitoring will be conducted in accordance with Guidance note on membrane filter method for estimating airborne asbestos fibres 2nd edition (NOHSC:3003, 2005). Meteorological conditions will also be recorded before, during and after demolition works to determine wind speeds and direction.
- Attended dust monitoring - hand held real time dust monitors will be used to assess dust emissions the day prior to, during and the day following stack demolition at the edge of the Exclusion Zone located downwind of the stack. Provision is made for three monitoring locations; the actual locations will be based on predicted wind directions and access to private property, but at least one will be installed within the Port Kembla Preschool, located at the crest of Military Road. EPA, DPI and WCC will be informed of the locations prior to demolition. The monitoring will be carried out using calibrated Dustrak DRX monitors or similar, which allows logging of dust levels for various particle sizes (including PM₁₀ and PM_{2.5}).
- Dust deposition gauges - dust deposition samples will also be collected for the month in which the stack demolition occurs. The analytical methods for dust deposition monitoring will be consistent with that prescribed in the EPL (no. 1753).



- Inspections - public areas and buildings within and immediately surrounding the demolition exclusion zone will be assessed and photographed on the day of demolition – prior to and immediately following demolition of the stack.
- Video footage - PKC and a Police helicopter will record the demolition of the stack. At least one of these cameras will be used to document whether visual levels of dust from demolition have moved over the suburb of Port Kembla.
- Field screening screening of dust and soil:
 - A portable X-ray fluorescence (XRF) meter will be used to assess metal concentrations of collected dust (within a large collection pan or the like) in the field. Assessment of concentrations of metals in soil will also be completed at a minimum of three locations around Port Kembla prior to and immediately following demolition. At each location up to 10 readings will be taken to assess the ambient variability in soil quality. An alternate approach (to screening native soil) will be to place trays of inert sand in the field and measure metal concentrations before and after demolition. It is noted that it may not be possible to collect sufficient dust to allow discrete screening using the XRF. The data from the XRF screening should be available within 1 hour after entry to the Exclusion Zone is permitted for Golder personnel.
 - A suitability qualified person will be available to conduct microscopic analysis for the presence of asbestos fibres in dust which may be deposited outside of the site boundaries. The data from the asbestos analysis should be available within 1 hour after entry to the Exclusion Zone is permitted for Golder personnel.

The locations of the dust monitoring network to be applied for the stack demolition are shown in Figure 3. The attended monitoring locations are indicative; the actual locations of the monitoring will depend on wind direction and property access. The inspection locations and soil and dust screening locations will be established the week of demolition in conjunction with EPA.

The screening criteria used to assess the air quality sample data from the attended and unattended (HVAS) dust meters and dust deposition gauges are provided in the DMP (Golder, 16 December 2010). The proposed screening criteria for PM_{2.5} (which is not monitored as part of the general demolition program and therefore not included in the DMP (Golder, 16 December, 2010)) is 25 ug/m³ (24 hour average) (NEPM, 7 July 2003).

The results of the monitoring will be provided through the following mediums:

- Posted on the project website (www.stackinfo.com.au) following validation of the data quality.
- The monthly demolition environmental monitoring reports provided to EPA, DPI and WCC.

Interpretation of the results will take into consideration wind direction and strength data obtained from PKC's weather station, as well as those surrounding the site at Hill 60 and Port Kembla Signal Station.

The supplementary unattended dust monitoring devices (HVAS) for the stack demolition (as described above) were installed, calibrated and run one week before the proposed demolition date. The units were installed by an experienced air quality scientist approved by DPI.

The use of the monitoring data in assessing whether and where dust impacts have occurred is described in the Dust Cleanup Protocol (below).

Contingency Plan

The following contingency measures and actions in relation to air quality are made for the following scenarios:

- High and changing winds have the potential to adversely affect the performance of the dust suppression network and may result in dust settling on and beyond the Exclusion Zone. Review of historical wind



direction and speed data provided by the Bureau of Meteorology for the Bellambi Station indicates the dominant wind directions during February are southerly and south westerly in the morning and north easterly and southerly in the afternoon. Given demolition is proposed to occur on the morning of 20 February 2014, it is likely that wind conditions will take dust (not addressed by the dust suppression network) away from residential areas. However, should a strong northerly wind direction occur on the day of demolition, there is the potential for dust to be carried onto, and potentially beyond, the Exclusion Zone towards Warrawong. Measures which will be applied in such circumstances include the following:

- Dust suppression network – the operation of the dust suppression devices proposed for use can be readily amended to suit the prevailing wind conditions. Changes which can be implemented to the operation of the devices include the following:
 - Dust Boss DB-60: the orientation, vertical angle and operating arc of the units can be readily altered to maximise the throw or cast of water and target potential dust sources and/or protect receptors.
 - Nelson Big Gun 100: the orientation and arc through which the units can be easily adjusted.
 - Both: the distance the units are placed from dust emission sources can be rapidly altered given the construction of the devices and through the use of long hoses.
 - Inclusion of additional dust suppression devices if forecasts indicate adverse conditions may prevail on the day of demolition.
- Water carts: two water carts fitted with spraying nozzles will be on standby to supplement (as required) the Dust Boss DB-60 and Nelson Big Gun sprinkler dust suppression devices. The water carts may be used on- and off-site to assist with dust suppression (as soon as the all clear is given to access the Exclusion Zone and site), which may include, but not necessarily be limited to, the following scenarios:
 - Targeted suppression of dust at release point sources (eg at the base of the stack) where the existing fixed network is proving ineffective in managing emissions.
 - Along site boundaries if there is evidence of dust moving beyond the boundaries of the site.
 - If fixed devices are damaged or not operating to specifications due to damage from the demolition, restrictions in water supply or for other reasons.
 - To wash down internal and external roads to mitigate the potential for spreading and tracking dust onto public roadways beyond the area of dust impacts.
- Early warning of residents:
 - PKC will monitor the wind conditions and forecasts prior to and on the day of demolition. This information will be used to inform local residents of the potential for their property/portion of Port Kembla to be impacted by dust generated during demolition – so that plans for staying indoors, removing laundry from clothes lines, washing home grown produce, putting vehicles under cover, disconnecting water tanks and other appropriate measures can be made. This information will be communicated via the PKC website (www.stackinfo.com.au) on the days prior to and morning of the demolition. Provision of this information, and a general recommendation for the local population to monitor weather conditions on the day of the demolition, will also be communicated in the upcoming liaison activities described in Section 3.3.2.2.
- The stack falls away from the planned impact zone (and away from the water sprays) – as described above, the water spray network will be established using portable water cannons and sprinklers with long hose lengths which will allow the positions of the water sprays to be moved. Additionally, two water carts equipped with spraying nozzles will be located on standby. The timeframe for water cart access to the stack impact zone will depend on when the 'all clear' is provided by the stack demolition contractor (refer to SDPTP (Precision Demolition, 17 February 2014)).



- Failure of water supply – water for the dust suppression devices will be obtained from the following three water sources, providing for redundancy and contingency in the case of failure of supply to portions of the site:
 - Mains water - near the base of the stack (Point 1) and adjacent to the Main Store (Point 2).
 - Stored water – which will be pumped from the 1,250 m³ stormwater detention pit (Point 3).

The locations of these water sources are shown in Figure 4.

Dust Clean Up Protocol

EPA (14 November 2013) requested that PKC develop a protocol for clean up and rectification of dust impacts which might occur as a consequence of the demolition of the stack. The approach to clean up of potential impacts is described below and takes into consideration comments provided by EPA (5 February 2014) and WCC (31 January 2014).

Monitoring Regime

To assess the whether dust impacts have occurred as a consequence of demolition (and the nature of these impacts), the following monitoring programme will be implemented (described above in more detail) by PKC (under the escort of NSW Police, as required):

- Data available on day of demolition (real-time):
 - Attended dust monitoring for TSP, PM₁₀ and PM_{2.5} using hand held real time monitors.
 - Inspections of public areas and buildings prior to and immediately following demolition of the stack.
 - Video footage obtained from the Police Helicopter and cameras installed by the demolition contractor.
 - Screening of dust and soil using a portable XRF and dust for asbestos.
 - Meteorological data including wind speed and direction available from the site weather station and Bureau of Meteorology website.
- Data available approximately one week following demolition
 - Unattended HVAS sampling for TSP, metals, PM₁₀ and PM_{2.5}.
 - Dust deposition gauges.
 - Asbestos monitoring on the boundaries of the site bordering the residential areas.

The use and interpretation of these data are described in the following sections.

Day of demolition

The data available on the day of demolition will be used to assess whether:

- Dust impacts are likely to have occurred.
- The locations across which these impacts may have occurred.
- The metal composition of the impacts – which are considered the main chemicals of interest based on the assessment of the stack condition (refer to Section 4.2.1).

This assessment will be made by PKC's appointed environmental scientists (who will collect the data under Police escort) and public health expert an estimated one hour following the all clear being given by the Police for PKC's staff to enter the Exclusion Zone (to complete the monitoring activities described above). This time



period will be dependent on the extent of dust deposition beyond site boundary areas. The results of the assessment will be given immediately to representatives from NSW Police, who will all be located in a central command position with PKC's appointed health expert. A decision to allow residents back into the Exclusion Zone or restrict entry until such a time as dust clean up measures are complete will then be issued by the Police commander following consultation with the other regulatory agencies (DPI, EPA, NSW Health and WCC). The results of the assessment and the monitoring data will be posted on the www.stackinfo.com.au website within 3 hours of the assessment being made.

The potential for impacts to have occurred will be based one or more of the following parameters:

■ Potential amenity and nuisance impacts:

- Evidence from real time video footage streamed from the Police Helicopter (and footage from other cameras arranged by the demolition contractor) showing visible dust moving over residential areas of Port Kembla.
- Inspections and photographic evidence showing dust deposition from the stack has occurred.
- Attended dust monitoring results greater than the screening criteria provided in the DMP (Golder, 10 December 2010) and in Section 4.2.1 of this document (PM_{2.5} only) – noting this represents a conservative assessment (these criteria are 24 hour or annual average criteria related to risks posed by inhalation rather than dust deposition. Risks posed by inhalation will be managed through implementation of the Exclusion Zone and precautionary measures provided to the community).

■ Potential health impacts:

- Concentrations of metals in discrete dust samples (if able to be assessed) being greater than the NEPM HIL A values **and** a corresponding significant increase (30%) in the metal concentrations measured in soil after demolition at each screening location. As indicated in Section 4.2.1, the concentrations of the metals of interest in dust are expected to be well below the NEPM HIL A levels, and therefore this scenario is considered very unlikely.

A summary of the relevant criteria is provided in the table below.

		Soil Quality	Air Quality
Analyte	Unit		
Total Metals			
Arsenic	mg/kg	100	na
Cadmium	mg/kg	20	na
Chromium	mg/kg	100	na
Copper	mg/kg	6000	na
Lead	mg/kg	300	na
Nickel	mg/kg	400	na
Selenium	mg/kg	200	na
Zinc	mg/kg	7400	na
Mercury	mg/kg	40	na
TSP	mg/m ³	na	0.09
PM10	mg/m ³	na	0.05
PM2.5	mg/m ³	na	0.025
Legend:			



	Soil Quality	Air Quality
na - not applicable		

If impacts are deemed to have occurred, the clean up actions will be undertaken immediately following assessment, and will include the following (within and potentially outside the Exclusion Zone):

- Task 1 - inspecting and cleaning of public roads, footpaths and parks using water carts (2), street sweepers (3) and vacuum trucks (1) placed on standby. These areas will be cleaned first to mitigate re-suspension and migration of deposited dust by passing road traffic. Covers will be put over stormwater entrance points to mitigate washing of dust into the stormwater network.
- Task 2 - cleaning of houses, cars and gardens of affected residents and businesses using labourers (10 placed on standby), water carts, vacuum trucks and street sweepers. Where possible, deposited dust will be washed onto hardstand areas within or on the road adjacent to the properties where it will be captured by street sweepers and the vacuum truck. Wash downs will be completed using water available at the property, or from the water carts. Any stormwater entry points on the residential properties will be covered to mitigate movement of sediment into the stormwater network. The coordination of the cleaning effort will be made by PKC in consultation with NSW Police, with the aim being to allow progressive opening of the Exclusion Zone as affected areas are cleaned.

The cleaning of public areas and private properties will be documented (written description of areas/properties cleaned, activities completed and photographic evidence prior to and following cleaning) and provided to PKC's appointed public health expert for assessment. If the rectification of dust impacts is considered to be complete by the health expert, this information will subsequently be passed onto NSW Police, who are responsible for allowing the return of occupants to their respective properties. This documentation will also be posted on the www.stackinfo.com.au website and provided separately to the individual occupant. The public should contact PKC on 1 800 688 587 if it has any questions or complaints in relation to dust impacts or subsequent cleaning activities associated with the stack demolition. PKC will make every effort to address and make good any impacts associated with the activity.

NSW Police are the responsible party for organising accommodation of displaced residents (with costs associated with this activity borne by PKC) – in the instance that return to their houses cannot occur on the day of demolition. However, if there are residents who refuse to return to their homes after assessments indicate it is safe to do so (as judged by PKC's health expert and NSW Police, or consider that further clean up of their property is necessary, they should contact PKC directly PKC on 1 800 688 587, who will either:

- Refer the resident or occupant to the Dispute Resolution Panel (refer below) or
- Temporarily accommodate the affected person(s) based on the nature of the claim and until such a stage that supplementary cleaning are complete (if required).

Week following demolition

The monitoring data available approximately one week after stack demolition (refer above) will be compared to the adopted screening criteria (refer to SDMP, Golder 29 November 2013) and will be used to either

- Verify that dust impacts are unlikely to have occurred - where monitoring data available on the day of demolition also indicates this to be the case.
- Evaluate and verify the nature and extent of impacts that may have occurred, and assess the need for:
 - Additional inspections and assessment of impacts (and subsequent cleanup) associated with amenity.
 - A qualitative or quantitative assessment of risks to human health posed by dust inhalation and deposition to residents and workers in Port Kembla. These assessments would be conducted in a manner consistent with enHealth (2012), and in consultation with NSW Department of Health. The



risk assessment report (if required) would also be provide to the NSW Department of Health for review and comment.

PKC will provide the regulatory group and general public (initially via the www.stackinfo.com.au website, but subsequently via letter drops and personal home visits (if required)) with the fixed monitoring approximately one week following demolition, and indicate what, if any, actions (such as those described above) will be conducted by PKC, and the timing for completion of these actions. These data and assessments will also be included in the monthly demolition environmental monitoring report.

Dispute resolution

In the approval for the stack demolition, DPI (14 December 2013) required the formation of a Dispute Resolution Panel to assess disputed claims associated with dust impacts (as well as structural damage). PKC has appointed Mr Aleks Todoroski as the air quality scientist for the panel. His appointment has been endorsed by DPI. Mr Todoroski will be present on the day of demolition and will be provided with the following information to support any assessments he may need to make:

- The final version of the SDMP (this document).
- Monitoring locations and data (as described above).
- Extent and nature of cleanup actions (if any) conducted by PKC.

The local community should contact DPI 1 300 305 695 to organise the services of the Dispute Resolution Panel. This is a message service, and therefore persons' names, address, contact details and nature of the dispute should be included in the message.

4.2.2 Noise and Vibration Management Plan

Associated Hazards and Risks

The felling of the stack has the potential to generate once-off noise and vibration impacts to surrounding workers and residents. The impacts may occur as a consequence of the use of explosives to demolish the stack, and the actual impact of the stack hitting the ground. The impacts will be very short term in nature.

In accordance with Condition 15(c) of the Project Approval, the stack demolition event has been scheduled so as to minimise disturbance to nearby receivers. The nearest receptors will not be in the local area due to the implementation of the Exclusion Zone. The mid-week mid-morning time provides that other receptors in the local area will be going about usual activities such as work, therefore avoiding particular impact such as sleep disturbance in their residences. Local schools will be vacated on the day of demolition.

Noise and vibration impacts associated with the subsequent breaking up, crushing, reuse on-site and off-site transport (as required) of the stack materials will be of the same nature as that experienced for the general demolition of the site. Accordingly, these impacts will be managed using the approach outlined in the DMP (Golder, 16 December 2010). It is noted that through the application of the approaches described in the DMP (Golder, 16 December 2010), there has been only one $Leq_{(15minute)}$ result greater than the project criteria, and no complaints in relation to noise from the site in the more than two years of demolition.

The following sections describe the controls and monitoring specifically associated with demolition of the stack.

Management Measures

Noise Management Measures

Management measures applied to the stack demolition to control and mitigate noise impacts will include the following:

- Community consultation – as detailed in Section 3.3.2.2, PKC has carried out a large community consultation program in relation to the demolition of the stack. Through this process, the local community and businesses have been aware of the approach to demolition of the stack, and the



potential noise impacts which can be expected on the day of the demolition at the scheduled time, in accordance with Condition 15(d) of the Project Approval.

- Exclusion Zone - the Exclusion Zone created for the stack demolition means the closest sensitive (residential) receptor will be 300 m from the base of the stack - affording greater potential for attenuation and mitigation of demolition noise impacts to sensitive receptors.
- Retention of buffer buildings – several buildings have been retained on either side of the fall zone of the stack. These will dampen the noise towards the east and west. The existing noise berm and the escarpments on the site topography provide buffers to the south. There are no sensitive receivers to the north.

The site slopes steeply down from south to the north, is located in a broad valley, and an approximately 5 m high sound wall is located along the southern boundary of the site. These physical conditions have contributed to effective mitigation of noise impacts from demolition activities conducted over the last two years, and are likely to assist in mitigating impacts from noise created by the demolition of the stack.

Vibration Management Measures¹

As indicated in the EA (PKC, 8 April 2009), demolition of the 200 m stack is considered to be the main source of potential ground vibration resulting from the demolition works. Accordingly, vibration and overpressure controls and monitoring (with the exception of the dilapidation surveys) will be limited to the stack demolition component of the works. The approach to the management of vibration and overpressure caused by the stack demolition is described below.

The vibration and overpressure will be managed through delayed programming of the blast sequence. The sequence has been developed in the SDPTP (Precision Demolition, 17 February 2014) with the tandem goals of ensuring that the stack falls in the correct manner and with sufficient energy, along with vibration control to minimise impact of annoyance and potential damage to property.

The SDPTP (Precision Demolition, 17 February 2014) indicates that vibration will also be mitigated through the topography of the site, with the stack falling on three tiers. The SDPTP (Precision Demolition 17 February 2014) also indicates this will spread the vibration impacts thereby minimising the intensity – there will not be one single vibration source as the whole stack impacts the ground.

The SDPTP (Precision Demolition, 17 February 2014) indicates the zone at which the explosives are to be deployed in the stack will still be wrapped in A64 Geofabric which will survive the blast and prevent offsite impacts, with an additional layer of wrapping over approximately half the stack in the direction of residences (south and west). The SDPTP (Precision Demolition, 17 February 2014) also indicates the wrapping may reduce overpressure by approximately 10dB, and that the overpressure levels at the nearest sensitive receptors are likely to be within the 120dBI limit, per Schedule 3 Condition 28 of the Project Approval.

As an additional control measure, approximately 36 x 1000kg bulka bags have been placed around the western side of the wedge to reduce noise, overpressure and vibration.

The stack demolition will be a major event which will involve significant disruption in the local area, and an appropriate Exclusion Zone will be enforced for the public including local residents. For this reason, the impacts of noise, vibration and overpressure are not expected to cause harm to persons in areas where they are permitted to be at the time.

The broader community in the local area outside of the Exclusion Zone has been notified of the demolition event, in accordance with Condition 15(d) of the Project Approval.

ANZECC 1990 Technical Basis for Guidelines to Minimise Annoyances due to Blasting Overpressure and Ground Vibration has been consulted. This guideline is designed for projects which require regular blasting, and is therefore not relevant to the stack demolition event due to its one-off nature. The management plan

¹ Vibration controls and monitoring developed by Wilkinson Murray



and monitoring measures outlined in this section are considered adequate to minimise annoyance to the local community for the approximately 15 second event.

Monitoring Program

Noise

The purpose of noise monitoring is to assess compliance with condition 26 of the Project Approval. It is noted that given that the noise associated with the stack demolition is one-off, the general limit should have a modifying factor applied in accordance with the NSW Industrial Noise Policy (EPA, January 2000).

Condition 26 of the Project Approval requires:

The Proponent shall ensure that the noise from the project does not exceed the noise goal of 60 dB(A) (LAeq(15 minutes) at the nearest affected residential receiver during the day.

The stack demolition event is expected to generate noise for 15 seconds total. Table 4.2 of the Industrial Noise Policy (EPA, January 2000) provides that for a noise event of less than 1.5 minutes, the increase in acceptable noise level at receptor is 20 dB(A). Therefore, the applicable noise goal is 80 dB(A).

In order to assess compliance with the 80 dB(A) noise goal, specific monitoring to be applied for the demolition of the stack will include the following:

- Unattended noise monitoring – the four unattended noise logging stations (NM01 - NM04) installed along the northern, southern, eastern and western boundaries record noise 24 hours a day, seven days a week and will be operating during the demolition of the stack to assess impacts at the boundary.
- Attended noise monitoring - attended noise monitoring will be conducted at the nearest sensitive receptors (located outside of the Exclusion Zone) to the south and west of the site. Monitoring at these locations will be conducted for 15 minutes prior to, during, and 15 minutes after the stack demolition using calibrated Quest SoundPro SP SE-2 instrument. The locations for the monitors will be selected to avoid shielding from nearby building/structures.

The locations of the noise monitoring network to be applied for the stack demolition are shown in Figure 3. The attended monitoring locations are indicative; the actual number and locations of the monitoring will depend on property access.

Vibration and Overpressure

The project approval prescribes that ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10 mm/sec. The overpressure level from blasting operations at the premises must also not exceed 120dB (Lin Peak). The purpose of the vibration and overpressure monitoring program is to measure compliance against these limits.

It is noted that these criteria apply only to the minimisation of annoyance and discomfort to persons at noise sensitive sites (for example, residences, hospitals, schools etc.) caused by blasting.

To determine compliance with the assessment criteria:

- Overpressure and ground vibration levels must be measured and electronically recorded outside the Exclusion Zone and at points within the grounds of potentially affected residential boundaries or other noise sensitive locations for all blasts carried out in or on the premises.
- Instrumentation used to measure the overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.

Advice from the project's structural engineers Tait Condon Pty Ltd (2013) indicated that the vibration from the explosive charges will be less than 1 mm/sec (peak particle velocity), as they will all be placed above ground level.



Calculations made by Tait Condon Pty Ltd (2008) (refer to the SDPTP (Precision Demolition, 17 February 2014) of ground vibration from the stack falling on the ground indicate peak particle velocities of 3.17 mm/sec at 200 metres (using the worst-case variable for ground condition). This is consistent with condition 27 of the project approval, which states that:

The Proponent shall ensure that the ground vibration peak particle velocity from blasting operations and the project does not exceed 10mm/sec

To determine compliance with the vibration and overpressure limits of the project approval, vibration and overpressure loggers will be installed at four points at the boundary of the Exclusion Zone (to be located based upon at or adjacent to sensitive receivers). PKC will also conduct vibration and overpressure monitoring at four locations within the Exclusion Zone to assess for potential property damage caused by the stack demolition. The instruments will meet the requirements of Australian Standard AS 2187.2-2006 and installed and monitored by Wilkinson Murray Pty Ltd.

The time, date, locations and results from the vibration monitors will be recorded and retained by PKC for subsequent use in reporting and provision to EPA. This will include blast wave form traces recorded by the meters.

In addition to the monitoring data, instrument calibration and maintenance will be carried out in accordance with the manufacturer's specifications by Wilkinson Murray Pty Ltd. Records of calibration and maintenance will be retained by the PKC for subsequent reporting.

The vibration and overpressure monitoring network is shown in Figure 3.

Contingency Plan

For the 200m stack demolition event, the main contingency plan is the establishment of the Exclusion Zone within which no people will be exposed. The event will last approximately 15 seconds and will not be repeated.

PKC will arrange and pay for repair of any private, government or commercial property damaged by vibration or overpressure as a consequence of the stack demolition. Dilapidation surveys completed by PKC (refer to Section 3.3.2.2) will be used to assess the presence and extent of any damages. The public can contact PKC by phone (1 800 688 587, email or mail using the contact details provided on www.stackinfo.com.au in relation to claims associated with property damage caused by the stack demolition. PKC will make every effort to address and make good any impacts associated with the activity. Any disputes in relation to property damage caused by the stack demolition should be referred to the Dispute Resolution Panel. The local community should contact DPI 1 300 305 695 to organise the services of the Dispute Resolution Panel. This is a message service, and therefore persons' names, address, contact details and nature of the dispute should be included in the message.

4.2.3 Traffic Management Plan

4.2.3.1 Overview

This Traffic Management Plan (TMP) for the main PKC stack demolition event has been prepared by Traffic Management Services and the Fifth Estate. The plan sets out the way in which traffic will be managed before, during and after the stack demolition.

The objective of the plan is to minimize the impact of the stack demolition on the local community whilst ensuring the safe demolition of the stack during the time the Exclusion Zone is in force.

It relates to condition 16 of the Project Approval, specifically for the stack demolition event, which sets out:

16. The Traffic Management Plan must:

(a) Describe the traffic volumes and movements to occur during demolition;



- (b) Detail the proposed measures to minimise the impact of demolition traffic on the surrounding network, including route selection, driver behaviour and vehicle maintenance;*
- (c) Include measures to manage pedestrian safety and movement;*
- (d) Outline proposed ingress and egress points;*
- (e) Outline any proposed road closures and detour options during the demolition;*
- (f) Details of a truck and equipment washing area and how this would be managed; and*
- (g) Detail the procedures to be implemented in the event of a complaint from the public regarding demolition traffic.*

It is noted that the Demolition Management Plan (Golder, 2010) remains relevant and this plan only updates those aspects of the TMP pertaining to the stack demolition event.

4.2.3.2 Traffic volumes and movements

The stack demolition event will not create any additional traffic movements. There is minimal equipment related to the stack demolition, with the small quantity of explosives pre-loaded prior to the day of demolition.

After the demolition, the rubble will be tested and, if it meets the relevant regulations, crushed for reuse as fill on site. It is estimated that of the approximately 10,000 tonnes of total mass in the stack, none will be removed for disposal.

4.2.3.3 Reduction of Impact

Network

There are not considered to be any network impacts due to the stack demolition because no additional truck movements will be generated.

Pedestrians

During the demolition event, nearby roads will be closed in order to establish the Exclusion Zone. Pedestrian access will be limited during this time. As soon as the roads are reopened, pedestrians will be able to access the area immediately.

No other impact on pedestrians will occur as a result of the stack demolition.

4.2.3.4 Contingency Planning

Should the stack demolition not proceed as planned, the contingency measures outlined in the SDPTP (Precision Demolition 9 October 2013) will be followed.

4.2.3.5 Ingress and egress points

During the Exclusion Zone being in force: No ingress or egress will be permitted.

During normal demolition activities: The main site entry will remain the Military Road entrance.

4.2.3.6 Road closures and detours

The parts of roads which will fall within the Exclusion Zone will be temporarily closed. These will include:

- Darcy Road between the intersection of Old Port Road and the Darcy Road PKC entrance
- Military Road between Old Port Road and First Avenue
- Wentworth Street east of number 164
- Wentworth Lane near the intersection of Church Street



- Allan Street north of Wentworth Street
- Fitzwilliam Street north of Wentworth Lane
- Church Street north of Wentworth Lane
- Military Lane north of number 17
- Third Avenue north of number 16
- Second Avenue north of number 6
- Reservoir Street north of number 17
- Marne Street north of number 7
- Electrolytic Street
- Reservoir Street
- Third Avenue
- Church Street

During the enforcement of the Exclusion Zone (ie while roads are closed) detours will be established to enable road users to utilise nearby roads to traverse the Exclusion Zone. The final figure in Appendix G shows the detour routes which will be indicated with signs during the Exclusion Zone.

The Exclusion Zone will also necessitate the detour of the local bus service operated by Premier Illawarra. The bus operator has been contacted to advise that Route 43 will be disrupted for the duration of road closures. Once the date for the demolition has been set, the operator will be informed of the date and time of the disruption, and detours will be suggested in line with the detour plan in Appendix G.

Appendix G contains additional detail and plans which will be used by the traffic contractor on the day.

It is noted that the Traffic Management Plan described in the DMP (Golder, 16 December 2010) will be reinstated as soon as the Exclusion Zone is no longer in force.

4.2.3.7 Management of Road Closures

Two weeks prior to the demolition, virtual message boards will be established which will warn the public of the detours which will be in place during the enforcement of the Exclusion Zone.

The evening prior to demolition, 70% of the temporary fencing will be in place, leaving all roads accessible until the morning deadline.

On the day of demolition, the following procedure will be followed:

- 1) Traffic Management Services Australia crews will meet in the morning for a short site meeting
- 2) Traffic controllers to spread out to their allocated streets
- 3) All temporary fencing to be completed to enforce total Exclusion Zone
- 4) Traffic controllers to have all required signage (as per Traffic Management Plan drawings in Appendix G) in place with barriers
- 5) Radio communication to be kept with Traffic Management Services Australia team leaders and Police for duration of closure
- 6) All roads to be opened when all clear is given only from Police & PKC



Traffic Management Services will establish control points relating to the roads which will be closed on the day of demolition. The duration of the closure will depend on the potential risk of harm to nearby persons as a result of the stack demolition event. This will likely be in the order of 4 hours.

4.2.3.8 Responsibilities

Section 9 ("Roles and Responsibilities") of the Illawarra Emergency Management Committee's Exclusion Zone & Evacuation Plan sets out the agencies and consultants involved in the evacuation on the day. A summary of the roles is below.

NSW Police	Management of the evacuation Coordination with all agencies
Precision Demolition	Demolition contractor Licensed shot firer (Sean Miller)
Affective Services	Establishment of physical barriers
Traffic Management Services	Establishment of road closures and detour signage
Contingency agencies present at the command centre	WorkCover NSW Ambulance Service NSW Fire and Rescue NSW Department of Primary Industries
PKC	Response to community enquiries

4.2.3.9 Truck washing area

The truck washing area described in the DMP (Golder, 16 December 2010) will continue for the stack demolition event.

4.2.3.10 Complaint response plan

The two primary contact mechanisms which have been set up for the stack demolition are:

- A free call 1800 telephone number (1800 688 587) staffed by a PKC employee.
- A website with information about the stack demolition (www.stackinfo.com.au) with a feedback form. The website will be updated to include contact names, numbers and postal details for PKC staff to allow the public to lodge enquiries or complaints. This information will also be displayed on boards and fences surrounding the site. It is noted that these contact details have already been provided to residents in the two letters sent advising of the stack demolition.

Contact with members of the public is recorded and any follow up actions noted. PKC will respond to complaints within 48 hours.

4.2.4 Demolition Heritage and Monitoring Well Management Plan

General Obligation and Commitment

The conservation policies and strategies described in Sue Rosen and Associates (October 2010 and May 2011) will be followed by PKC – in consultation with a suitably qualified heritage consultant – after the impact zone has been made safe by the demolition contractor.



Associated Hazards and Risks

As indicated in Section 2.2, the following structures located on Lot 21 have heritage significance and therefore require management and protection during demolition:

- Precious metals stack.
- Old Assay Building.
- The base of the 200 m stack

The locations of these structures are illustrated in Figure 2.

Demolition of the 200 m stack presents the main potential risk of damage to the heritage structures. Since both structures are outside of the probable fall zone for the stack, potential for damage is related to flying debris following the stack hitting the ground.

Key monitoring and extraction wells are also required to be protected for the purpose of future groundwater quality monitoring and potentially remediation.

Controls

The potential for damage to the site heritage structures will be managed using the following approaches:

- Protection of existing structures - the precious metals stack is located more than 250 m from the base of the stack and north of the Refinery building, which will afford shielding from the stack impact area. Similarly, the Old Assay Building is located approximately 300 m from the base of the 200 m stack, with the Main Store, Engineering Store and Ore Gantry also providing shielding from the impact zone.
- Exclusion Zone and technical oversight – a zone will be set up around the base of the stack to prevent damage from post demolition break-up of the stack materials. Demolition and finishing of the base of the stack (to preserve the basal 2 m) will be carried out as a separate demolition phase and be conducted under the supervision of an appropriately qualified heritage consultant.

Protection of the monitoring and extraction wells will consist of marking and covering the well heads with protective plates to mitigate the potential for damage during demolition. Well heads which were previously above the ground level were cut down to the ground surface, retro-fitted with covers flush with the ground surface, and covered with plates for protection.

Maintenance and Monitoring

Consistent with the DMP (Golder, 16 December 2010), monitoring and maintenance of heritage items associated with the stack demolition will include:

- Carrying out dilapidation surveys before and after demolition of the stack.
- Inspection and cataloging (including photographs) of the protective measures placed around the heritage structures.
- Carrying out repairs to the structures based on damage which may have occurred as a consequence of demolition. The extent of damage will be assessed based on the pre- and post-demolition dilapidation surveys.

Surveys and inspections of the heritage items will be conducted by a qualified independent heritage consultant/archaeologist.



4.2.5 Soil and Water Management Plan

The felling and subsequent breaking up of the structure will result in sediment and stormwater runoff due to the application of water sprays to mitigate dust generation and following rainfall events.

Stormwater and sediment generated from the stack demolition and break up (along with that from the remainder of Lot 21) is directed to holding ponds in the northern portion of the site and then passed through the site waste water treatment plant before discharge to a nearby drain. This collection and treatment process forms a licenced activity under the EPL (no. 1753).

The holding ponds and waste water treatment plant previously treated water and sediment from:

- Site stormwater;
- Process water; and
- Contaminated groundwater.

Treatment requirements to address site stormwater and sediment represent approximately 5 % of the capacity of the waste water treatment plant - the plant is typically operated for a portion of one day per week to treat accumulated stormwater and sediment. This compares with 24 hrs per day, 7 days a week during the operating period of the site. Therefore, any additional sediment or stormwater generated as a consequence of the stack demolition will readily be accommodated by wastewater treatment plant.

The potential risks, controls, monitoring and contingencies associated with managing soil, sediment and stormwater generated on site is described in the DMP (Golder, 16 December 2010); the stack demolition will not require any changes or additional measures to the approaches outlined in that document.

4.2.6 Waste Management Plan

General

PKC indicated that approximately 10,500 tonnes of concrete, brick and steel reinforcing is contained within the stack. Information provided in the Demolition Heritage Management Plan (Sue Rosen & Associates, May 2011) indicates that of this total mass, approximately 92% of the stack consists of concrete (footings and outer weather shield), and refractory brick used to construct the inner portion of the stack forms the remaining approximately 8% of the stack mass.

In general, the approach to classification and management of stack demolition waste will be conducted in a manner consistent with that described in the DMP (Golder, 16 December 2010), which includes details on the following:

- Sampling density and development of analytical schedules.
- Assessment for re-use or disposal off-site.
- Tracking the fate of waste re-used on-site or disposed off-site (waste inventory).

Specific measures applied to the assessment and management of stack demolition waste are described in the following section.

Specific management measures for stack demolition waste

Once the stack has been felled, the rubble will form a single pile. Steel reinforcing will be removed and recycled if possible, and the remaining material (mainly concrete and bricks) will be crushed, with every effort made to separate brick and concrete material. The purpose of sorting the bricks and concrete will be to minimise the potential for contamination of concrete with (the minor amounts of) impacted bricks, and maximise the potential to reuse the demolition waste on site.



The brick and concrete debris will be tested to determine its applicability for reuse on the site or other disposal options, as set out in the Waste Classification Guidelines, the Recovered Aggregate Exemption (2010) and the DMP (Golder, 16 December 2010). It is noted that the Recovered Aggregate Exemption does not apply to refractory brick, and therefore a site specific resource recovery exemption may be sought by PKC, in accordance with DECCW (2011). The management approach for stack demolition waste proposed to remain on site will be provided to EPA for review and comment prior to placement. This will include an assessment of the suitability of the material to remain on site, and application of management measures to allow its reuse (if required).

Testing of the demolition waste will include, at a minimum, the metals of interest described in Section 4.2.1 (above). A greater density of sampling may be applied to brick material if there is evidence of variability in the chemical concentrations in the sampled material. The analytical data presented in Appendix E indicates that the bricks in total would be classified as General or Restricted Solid Waste.

The time frame for breaking up, crushing and reusing/disposing of the stack materials is likely to be in the order of three weeks, based on estimates provided to PKC by the demolition contractor. The following management measures will be applied during movement and crushing of the stack demolition waste:

- Prior to relocation, crushing and testing, the demolition waste will be wet down to mitigate generation and movement of dust off site.
- Crushing of the waste will include the application of water sprays (using the Nelson Big Gun Sprinklers or the like) to minimise dust generation.
- Crushing will not be done on windy days and will be conducted in an area of the site affording wind and acoustic shielding – mitigating the potential for dust and noise impacts to surrounding residents. Preference will be given to crushing and processing the material under inside buildings such as the former refinery building or Bulk Concentrate Store.
- Crushed material will be classified and relocated as quickly as possible. The crushed material will be wet down, with material requiring landfill disposal relocated undercover to the Bulk Concentrate Store until off site disposal is arranged.

Attended monitoring of dust in close proximity and downwind of crushing units and stockpiles will be conducted to assess the effectiveness of management measures and the potential for these activities/materials to impact on air quality on and off site. Photographic records of the crushing activities will also be made available to the regulatory authorities and general public in the monthly demolition environmental monitoring reports (along with the results of the attended dust monitoring).

4.3 Environmental Schedules – Performance Monitoring

Relevant forms and registers to be used during the environmental management of the stack demolition are provided in the DMP (Golder, 16 December 2010).



5.0 CONTROL AND MODIFICATION OF THE SDMP

Controlled copies of this SDMP will be issued to the PKC project manager, Golder and the stack Demolition Contractor. Staff on-site (including employees of PKC, the demolition contractor and other contractors) will be informed of the key environmental responsibilities required by the SDMP through site induction and SDMP training (refer to Section 3.4).

Changes to the SDMP must be documented and signed off by PKC and Golder, as well as the relevant stakeholders. It is the responsibility of the PKC to maintain the currency of the SDMP.



6.0 REFERENCES

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- National Environment Protection Council, 7 July 2003). National Environment Protection (Ambient Air Quality) Measure.
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7.0 CLOSING

Should you have any queries regarding the content of this SDMP, please do not hesitate to contact the undersigned.

Regards,

GOLDER ASSOCIATES PTY LTD

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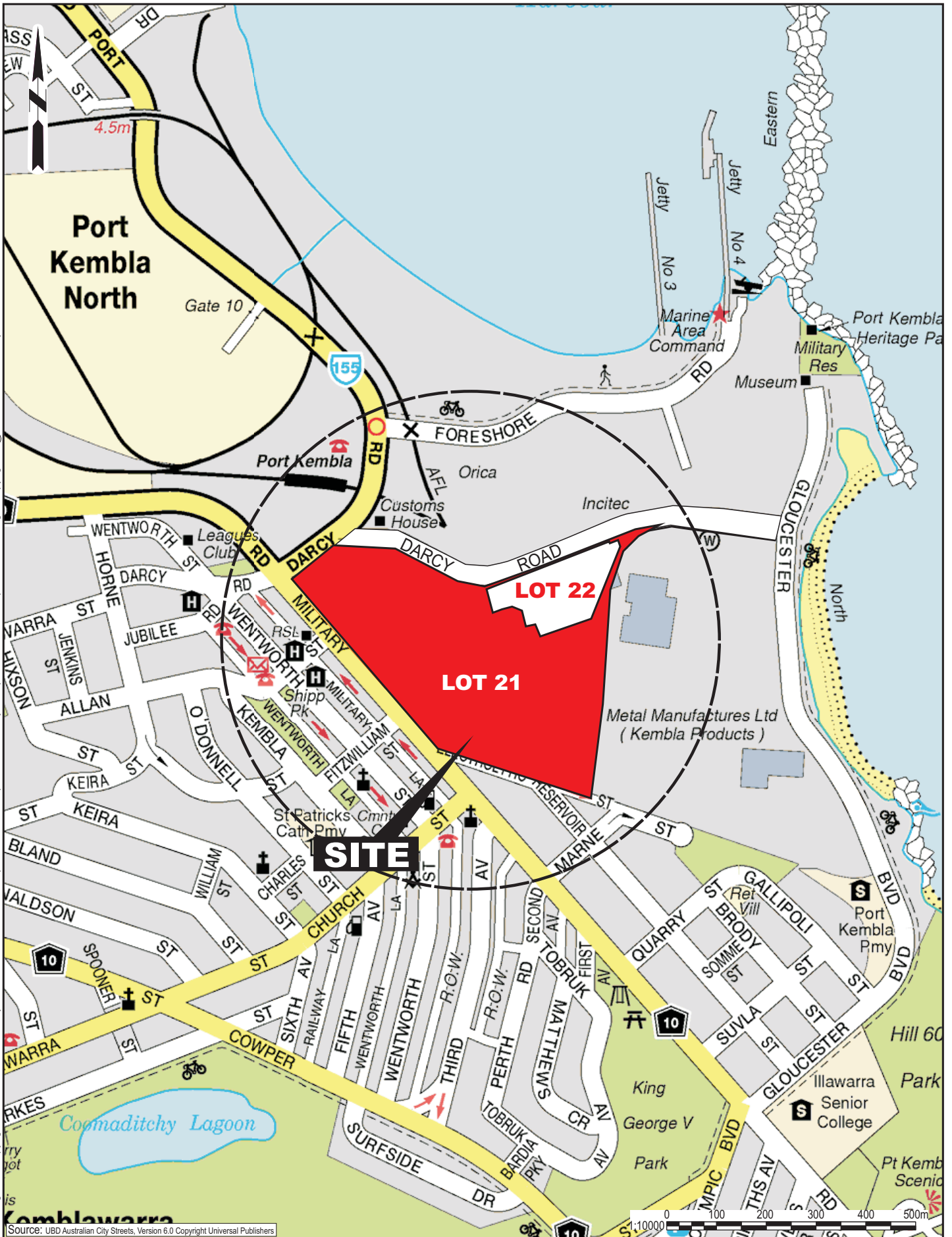
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8\087663019-r-008-rev0.docx



FIGURE 1

Site Location Plan

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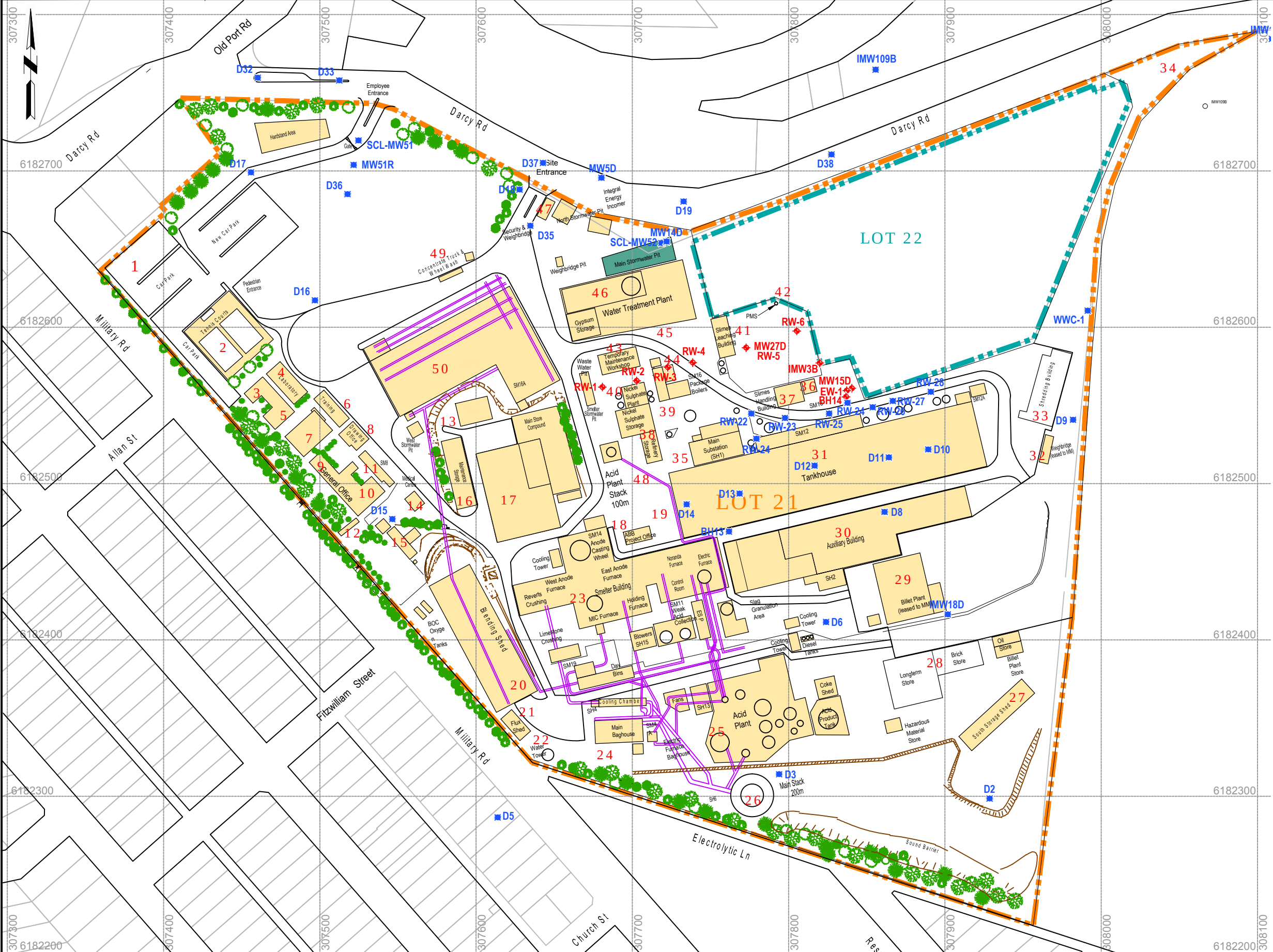
 www.golder.com GOLDER ASSOCIATES PTY LTD		CLIENT PORT KEMBLA COPPER		PROJECT STACK DEMOLITION MANAGEMENT PLAN	
DRAWN HC		DATE 20.03.2010		TITLE SITE LOCALITY PLAN	
CHECKED GDM		DATE 20.05.2010			
SCALE 1:10,000		A4		PROJECT No 087663019	DOC No 001
				DOC TYPE R	FIGURE No F0001
				REV No 0	FIGURE 1



FIGURE 2

Site Layout Plan

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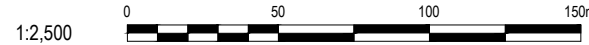


- KEY**
- 1 Carpark
 - 2 Tennis Courts
 - 3 Fire Assay
 - 4 Laboratory
 - 5 Research Building
 - 6 Training Room
 - 7 Old Assay Building
 - 8 Drawing Office
 - 9 Admin Office
 - 10 General Office
 - 11 Server Room / Env. Office
 - 12 Archive Room
 - 13 Amenity Building
 - 14 Medical Centre
 - 15 Watchman's Hut
 - 16 Engineering Store
 - 17 Engineering Workshop
 - 18 Office 'Bunker'
 - 19 Power House
 - 20 Blend Shed
 - 21 Flux Shed
 - 22 Old Stack Base
 - 23 Smelter
 - 24 Bag House
 - 25 Acid Plant
 - 26 200m Stack
 - 27 Southern Storage Shed
 - 28 Main Store
 - 29 Billet Plant
 - 30 Auxiliary Building
 - 31 Refinery
 - 32 Weighbridge & Office
 - 33 Lead Shed (Store)
 - 34 Rail Weighbridge
 - 35 Sub Station
 - 36 Switch Room
 - 37 3 Bedroom
 - 38 Storage Shed
 - 39 Compressor House
 - 40 Nickel Plant
 - 41 Selenium Building
 - 42 Precious Metals Stack
 - 43 Plumbers Shop
 - 44 Switch Room
 - 45 Painters Shop
 - 46 Water Treatment Plant
 - 47 Weighbridge & Office
 - 48 Tail Gas Scrubber
 - 49 Truck Wash
 - 50 Bulk Concentrate Store

- LEGEND**
- BUILDING
 - PIPING
 - EXISTING EXTRACTION WELL LOCATION
 - EXISTING MONITORING WELL LOCATION
 - LOT 22
 - LOT 21

SOURCE: SAMPLE LOCATIONS ARE BASED ON URS FIGURE 1, JOB REF. 4327183, FIGURE 01_20070712.WOR, 12.07.2007, TITLED "CRITICAL DEEP MONITORING WELLS" INFRASTRUCTURE AND NUMBER KEY BASED ON DRAWING PROVIDED BY PORT KEMBLA COPPER PTY LTD, DATED 10.09.1998, REF. PT-020-0147, REV C, TITLE "GENERAL PURPOSE SITE PLAN"

ADAPTED FROM DIGITAL CADASTRE DATABASE, NSW DEPARTMENT OF LANDS, 2004, ZONE 56 MGA COORDINATES



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CLIENT PORT KEMBLA COPPER		PROJECT STACK DEMOLITION MANAGEMENT PLAN			
DRAWN BY HC	DATE 20.05.2010	DRAWING TITLE SITE LAYOUT PLAN - LOT 21 AND SURROUNDS			
CHECKED BY -	DATE 14.04.2010				
SCALE 1:2500	SHEET SIZE A3	PROJECT No 087663019	DOC No 001	DOC TYPE R	FIGURE No F0002
			REVISION 0		FIGURE 2



FIGURE 3

Locations of Monitors

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STACK DEMOLITION MANAGEMENT PLAN

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NOISE AND DUST MONITORING LOCATIONS

- ### LEGEND
- Noise Monitoring Location
 - Air Quality Sample Location
 - Dust Deposition Sample Location
 - Possible Attended Noise and Dust Monitoring Location
 - Vibration and Overpressure Monitor Location
 - Exclusion Zone

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Street data sourced from Mapinfo StreetPro.

0 25 50 100 150 200 metres

SCALE (at A3) 1:6,000

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: 087663019
DATE: 07 FEB 2014
DRAWN: KB
CHECKED: GM

FIGURE 3

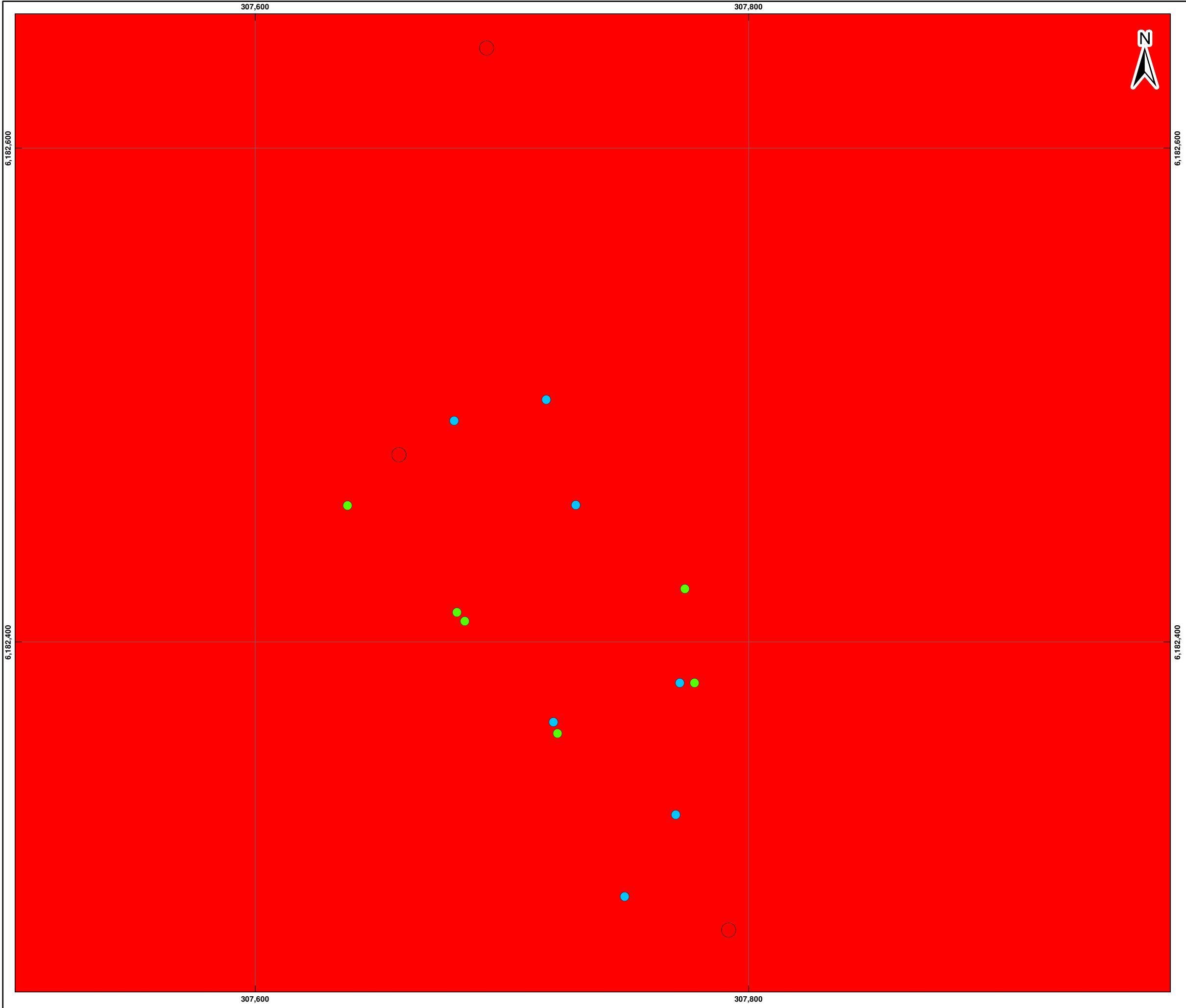




FIGURE 4

Stack Impact Zone and Dust Suppression Network

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STACK DEMOLITION
MANAGEMENT PLAN

PORT KEMBLA COPPER PTY LTD

STACK IMPACT ZONE
AND DUST SUPPRESSION
NETWORK

LEGEND

Dust Boss 60

Water Spray Sprinkler

Water Source

Terrace

Drop Zone Centre Line

Drop Zone

Building Exclusion Zone

NOTES

Coverage provided by Dust Boss 60 is based on 70° pivot and product specifications

Coverage provided by Water Spray Sprinkler is based on 60 °arc and 30 m cast

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Street data sourced from MapInfo StreetPro.

0 5 10 20 30 40 50 metres

SCALE (at A3) 1:1,500

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: 087663019

DATE: 09 OCT 2013

DRAWN: KB

CHECKED: GM

FIGURE 4

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APPENDIX A

Golder Demolition Management Plan (16 December 2010)



16 December 2010

CELEBRATING
50
YEARS
in 2010

Demolition Management Plan, Port Kembla Copper Smelter and Refinery, Port Kembla NSW

Submitted to:

Port Kembla Copper Pty Ltd
Military Road
PORT KEMBLA, NSW 2505

REPORT



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Photograph of Green and Golder Bell Frog

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Limitations (LEG04 RL1)

User Note: This Table of Contents section acts as a reference point for the Record of Issue, Executive Summary and Study Limitations sections as and when they might be required. Therefore, the structure of this section must not be altered in any way.



1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was engaged by Port Kembla Copper Pty Ltd (PKC) to prepare a Demolition Management Plan (DMP) for the demolition of the Port Kembla Copper Smelter and Refinery on Military Road, Port Kembla, NSW (the Site). The objective of the DMP is to provide general guidance to Site managers and workers so that activities associated with demolition are carried out in manner which:

- Is environmentally, socially and economically responsible;
- Minimises the potential for adverse impacts to occupants, environmental receptors and infrastructure in areas surrounding the site; and
- Is consistent with the requirements of the NSW Department of Planning's (DoP) Project Approval (Application No. 08_0191, 15 August 2010) and the site Environmental Protection Licence (EPL, no. 1753) (which is to be amended to consider the demolition project).

The individual management plans provided in this DMP include:

- Air Quality (Section 5.2.1).
- Noise and Vibration (Section 5.2.2).
- Traffic (Section 5.2.3).
- Construction Heritage Management Plan (Section 5.2.4).
- Soil and Water (Section 5.2.5).
- Waste (Section 5.2.6).
- Green and Golden Bell Frog (Section 5.2.7).

Management plans and documents which are in the process of being prepared include:

- Heritage Management Plan.
- Stack Demolition Plan, which will include the Emergency and Evacuation Management Plan.
- Applications to WorkCover NSW for a demolition work site permit to allow demolition to proceed.

The structure of the DMP has been based on *Guideline for Preparation of Environmental Management Plans Department of Planning (2004)*.

2.0 SITE DESCRIPTION

2.1 General

The Site is situated on Military Road in Port Kembla, NSW, and is bounded by:

- North - Darcy Road, beyond which is industrial land and Port Kembla Outer Harbour.
- South - Electrolytic Lane and Military Road, beyond which is the former Port Kembla Public Primary School (PKC owned land) and commercial and residential areas of Port Kembla.
- East – Metals Manufacturers (MM), beyond which is Gloucester Boulevard and the Pacific Ocean.
- West – Port Kembla Police Station and Court House, Old Port Road and Darcy Road.



The location of the site and surrounding land uses are illustrated in Figure 1.

The Site is situated on Lot 21, Deposited Plan (DP) 546139 and Lot 127 DP 257531 and is zoned 4B (Industrial – Heavy). PKC also owns the adjoining Lot 22 DP546139. There are no demolition activities to be carried out in Lot 22.

2.2 Site Layout

The layout of Lot 21, including the names and locations of the buildings and infrastructure, is illustrated in Figure 2. The following structures on Lot 21 are required to be retained and shall not be demolished:

- Water Treatment Plant (WTP) and Pits - the WTP is used to treat “first flush storm water” (equivalent to the first 10 mm of rain falling on the site during a rain event) captured on site and directed to the holding pits located adjacent the plant. The treated storm water from the WTP is discharged to a local storm water culvert under licence conditions prescribed in the EPL for the Site (Licence no. 1753). The WTP and associated pits will remain operational throughout the demolition project to capture and treat potentially contaminated stormwater and rinsates.
- Old Assay Office – the Old Assay Office is located along the south western boundary of the site and has been assessed to have heritage significance. Consequently, this structure will not be demolished and will be used as PKC’s main office during the course of demolition.
- Precious Metals Stack – the Precious Metals Stack is located along the central portion of the northern boundary of Lot 21 (bordering Lot 22). It has been assessed as having heritage significance and therefore will not be demolished.
- Groundwater extraction and monitoring wells – some of these are required to be retained as part of the ongoing monitoring which forms part of the Maintenance of Remediation Notice (Section 28 Notice) (DEC, 11 October 2007) currently placed on the site. These wells are required to be protected and if damaged, are to be properly abandoned and replaced.

The locations of the monitoring wells in Lot 21 required to be retained are illustrated in Figure 2.

3.0 PROJECT DESCRIPTION

3.1 General

The demolition project consists of four major actions:

- Material recovery and management;
- Management of regulated materials;
- Demolition of site structures; and
- Maintenance of site surfacing and final landform.

The demolition activities will be staged in order to achieve these outcomes whilst also maximising efficiencies and minimising the potential for adverse environmental impacts. Staging of demolition will also consider the potential sale of equipment.

The following sections summarise the rationale and scope for each of these actions. Section 3.6 describes the notional staging of the activities associated with demolition.



3.2 Material Recovery and Management

Maximising recovery of valuable or reusable material from the Site is a high priority for the demolition project since:

- There is a high intrinsic value in the plant and equipment retained on Site; and
- The environmental impact of the project will be minimised through dismantling and reuse or recycling rather than traditional demolition and disposal to landfill.

For these reasons, equipment that can be economically removed and sold for re-use will be removed prior to demolition of relevant structures. The process has already commenced.

In addition to equipment which will be sold for reuse, it is estimated that approximately 15,000 tonnes of ferrous scrap metal will be recovered for sale and recycling from the site infrastructure. Non-ferrous scrap metal, such as stainless steel and copper will also be recovered for recycling (where possible and practicable), whilst several thousand tonnes of uncontaminated concrete are also expected to be produced during demolition. The concrete will be crushed on site and either:

- Used on site to fill depressions or sumps; and/or
- Made available for recycling for various uses, such as road base.

3.3 Management of Regulated Materials

Prior to demolition, regulated materials will be managed to minimise the potential for adverse human and environmental impacts. This will involve the removal, staging, characterisation, packaging (where required), transportation, and disposal/recycling of the following items. Disposal will be conducted in a manner consistent with Waste Classification Guidelines (DECC, 2008).

- Asbestos containing materials (ACMs);
- Batteries (including exit signs and emergency lights);
- Chemical fire extinguishers;
- Electrical equipment and oil (including PCB dielectric where present);
- Fluorescent and other high intensity lamps;
- Fluorescent and high intensity light ballasts;
- Refrigerants (chlorofluorocarbons);
- Mercury-containing devices;
- Miscellaneous chemical containers and drums;
- Equipment oil;
- Potentially radioactive materials (smoke detectors, self-illuminating exit signs);
- Pressurised gas cylinders;
- Redundant above ground tanks and vessels that previously contained chemical substances and acids; and
- Building control and process piping residuals.



Former above ground fuel tanks will be managed consistent with the requirements of Australian Standard AS 4976-2008 The Removal and Disposal of Underground Petroleum Storage Tanks.

Following removal of the above-listed (and potentially other) regulated materials, decommissioning and decontamination of the greater building structures will be conducted in the following manner:

- Decommissioning of aboveground building control systems, including draining and management of fluids and solids (where applicable) in order to render these systems free of residuals prior to demolition. Piping related to potentially flammable materials shall be rendered inert by purging using an inert gas.
- Decommissioning and sale/disposal of electrical transformers.
- Decommissioning of below-ground utility lines and process lines in order to render them free of residual contaminated materials. This may include cleaning/pigging of process lines and trade waste sewer systems. Residual materials and rinsates shall be collected, securely stored, characterised and disposed of in manner consistent with Waste Classification Guidelines (DECC, 2008). The site wastewater treatment system may be able to treat some wash effluent/rinsate. PKC management staff will review and approve rinsate for disposal to the wastewater treatment plant based on the treatment capacity/capability of the plant, and the licence conditions for its operation.
- Decontamination of concrete - if concrete is proposed to be disposed as construction debris or reused as recyclable material, the material will be validated as uncontaminated by PKC. The approach to validation is described in Section 5.2.6.
- Residual material on building surfaces such as walls and ceilings:
 - a. Where spade-able accumulations of dust are identified, this dust will be removed by spades and placed in bins/covered stockpiles to mitigate the potential for emissions during demolition. This material will be characterised and disposed in a manner consistent with the Waste Classification Guidelines (DECC, 2008). Furthermore, demolition of structures which are likely to contain residual dust will not be conducted during periods of high wind in order to mitigate offsite effects.
 - b. Most of the dust on building surfaces is present as a light coverage only. Where spade removal of the residual dust is not possible, it will either be vacuumed dry with an enclosed industrial vacuum, or where inaccessible, it will be damped down with a water mist to ensure it is not released during the demolition process.

There may be other materials (not listed above) which will also be discretely removed and managed prior to demolition to minimise the potential for adverse effects.

The approach to characterisation and disposal of waste materials is described further in Section 5.2.6.

3.4 Demolition

The following outlines the broad scope and principles that will be followed prior to and during demolition.

- Structures on the PKC main Site will be demolished to slab level, except for those listed in Section 2.2 which are required to be retained;
- The administration and site offices will remain connected to electricity and water supplies throughout the Works. Termination of above- and below-ground utility will be carried out as required;
- Miscellaneous stand-alone items that are extraneous to the buildings, such as lamp posts, shelters, gates, signage, utility poles, interior site fencing, etc., and any general debris or trash that may exist on the property, will be removed;



- Site curbing and ponds/holding basins will be retained as they are an inherent part of the environmental protection measures (control of surface water and sediment run-off) for the Site;
- Material which is potentially contaminated will be staged on-Site in the Bulk Storage Building prior to further management (characterisation and disposal, or reuse, as appropriate);
- Following chemical and physical characterisation, contaminated material will be loaded, transported and disposed of at an appropriately licensed off-site facility;
- The Site contains structures that are heritage listed. Demolition works will be conducted in such a manner as to protect these structures from damage;
- The WTP will be retained throughout the course of demolition to allow treatment and management of potentially contaminated stormwater runoff and rinsates generated during demolition; and
- The Site contains a network of groundwater monitoring and pumping wells that are to be protected during the project (see Figure 2).

The prime method of deconstruction will be using heavy equipment such as 160 tonne, 87 tonne and 35 tonne excavators with special attachments such as grapples, pulverisers, shears, plus large mobile cranes. The contractor will also employ a variety of equipment for individual structures. The main stack will be felled using specialty demolition explosives as successfully demonstrated on several major industrial Sites.

Prior to the felling of structures, engineered methods will be modelled, discussed and reviewed by a team experienced in the demolition of similar structures. The structural integrity of the weakened structure is to be evaluated by external, independent consulting engineers and technical advisors. The contractor will apply a controlled collapse technique using engineered cuts, pre-determined weak points, mechanical force and gravity to bring structures safely to the ground.

As the demolition of structures is considered a “special task”, each step of the demolition process will be planned and scheduled to minimise the potential for adverse impacts. This will be facilitated by:

- Developing Work Method statements which form the basis for Job Hazardous Analysis; and
- Carrying out Demolition Risk Assessment Workshops.

The contractor(s) engaged for demolition shall hold the relevant level of licencing required by WorkCover NSW.

The actual approach and controls employed for demolition of the specific areas of the site or pieces of infrastructure will be detailed in the applications for a demolition work site permit made by the demolition contractor to WorkCover NSW.

3.5 Site Surfacing and Final Landform

The Voluntary Remediation Agreement (VRA, 19 April 2005) for management of contaminated groundwater under the site included capping of previously unsealed areas. Damage to the Site cap which occurs during demolition will be made good during or at the conclusion of demolition activities. The cap also acts as a management measure to mitigate potential exposure of site workers to soil contamination that may be present under the site.

Once demolition of the structures has taken place, the former building slabs will be exposed. These slabs will form part of the post-demolition surface cap and therefore shall be retained. Pits which sit below the general site level/topography will be filled with validated and crushed demolition material, such as concrete, and then sealed.



Where buildings and structures act as boundary walls or fences, fencing is to be erected in its place following demolition for fall protection and site security during and following demolition.

3.6 Demolition Staging

The staging of the project works is generally consistent with the order presented in Sections 3.2 – 3.5, and is broadly described below:

- 1) Selected and discrete removal of saleable equipment, regulated waste and accumulated dust from within the site structures;
- 2) Demolition of site structures, including recovery and sale of recyclable (uncontaminated) materials and management of potentially contaminated building fabric.
- 3) Upgrade and reparation of the Site surface such that the entire property is capped and generally level on completion of demolition.

Throughout the course of tasks 1 and 2, materials which are selectively removed or generated through bulk demolition will be securely stored, assessed and managed (recycled, reused or disposed off site) to minimise the potential for adverse human and environmental effects. Friable/particulate materials that have the potential to be dispersed by wind and water will be stored in the Bulk Concentrate Store until the management requirements for the material are assessed (through chemical and physical characterisation).

The intended order of demolition of the site is detailed in the tables attached in Appendix A.

It is noted that Bulk Concentrate Store and 200 m stack will be amongst the last structures demolished since:

- Stack - clearance of other site buildings from within the fall zone is required to minimise the potential for uncontrolled release of material within and beyond the site boundaries.
- Bulk Concentrate Store – it will be used to store and stage (undercover) demolition waste whilst it is being characterised for ultimate management, and may have value to future purchasers of the site.

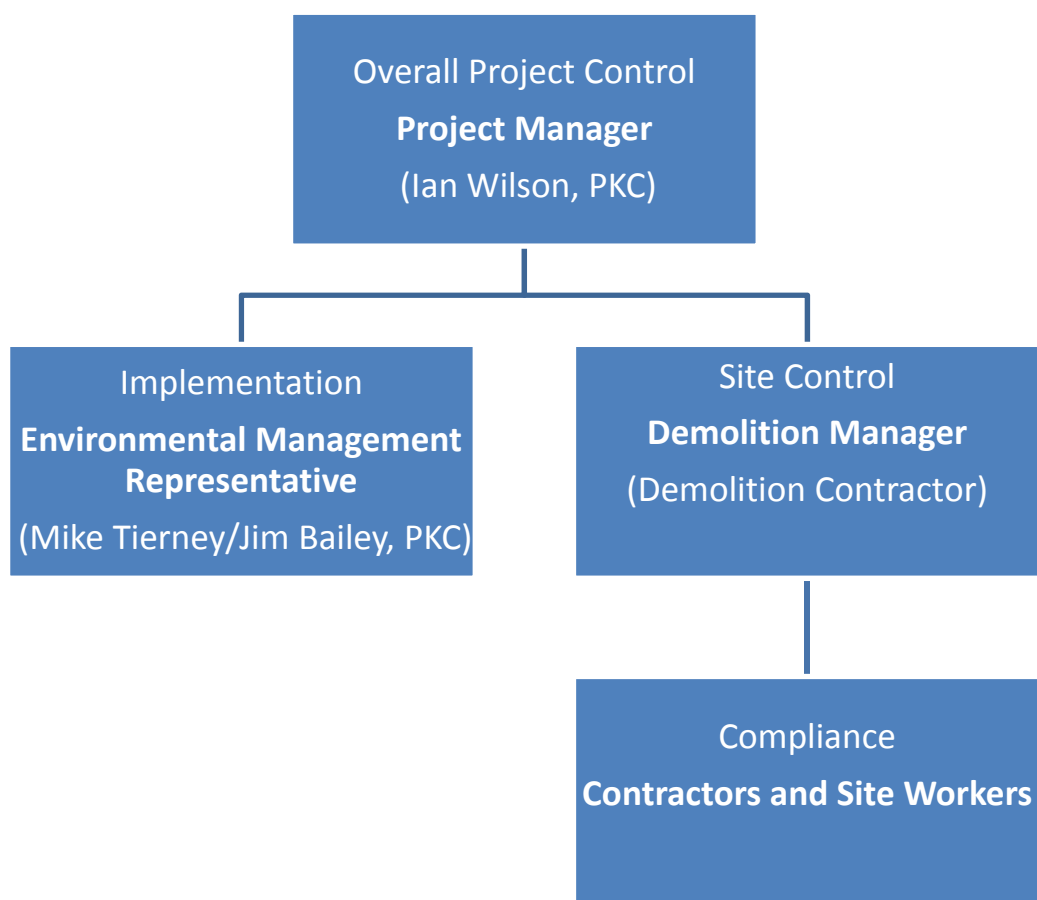


4.0 DEMOLITION MANAGEMENT

4.1 Demolition Management Structure and Responsibility

This section describes the management structure for the demolition works and how implementation of this DMP is to fit into that structure. The figure below presents a structure/flowchart for the demolition management structure and the position of the Environmental Management Representative (EMR), who is the principal administrator of the DMP.

Management Structure for DMP Implementation



Overall project control and responsibility for compliance with the DMP belongs to the PKC Project Manager, whilst the Demolition Manager has control of Site works. The PKC Project Manager and Demolition Manager will work with the EMR to implement all aspects of this DMP. The role of the EMR includes practical implementation and maintenance of this DMP, compliance monitoring, documentation, ensuring implementation of corrective actions, reporting, review and amendment of the DMP, as required.



4.2 Approval and Licensing Requirements

Activities associated with the demolition must comply with relevant legislation and regulations. Appendix B provides a list of legislation and Australian Standards that may apply to demolition.

Table 1 below presents a list of legislation (and regulators) relevant to the Project along with licenses, approvals and permits that may be required. Table 1 also identifies the person responsible for ongoing compliance monitoring.



PKC SMELTER AND REFINERY

Table 1: Regulatory Compliance Requirements

Regulatory Instrument	Licence/Permit/Approval/ Guideline/Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>SEPP (Major Developments) 2005</i>	Defines the suitability for consent under Part 3A of EP&A Act	Department of Planning	Project Manager	N/A	N/A
<i>Environmental Planning and Assessment Act 1979</i>	DMP to comply with Project Approval conditions for demolition (MP_08_0191) under Part 3A the of EP&A Act	Department of Planning	PKC Project Manager and EMR	Consistent EPL 1753 and Obligations within the EA and DMP	This DMP is based upon the <i>Guidelines for the Preparation of Environmental Management Plans</i> . Content based upon draft Project Approval Conditions prepared by Director-General
<i>Heritage Act 1977</i>	Two items listed by Heritage Branch are Assay Office and Precious Metals Stack. These items are not to be disturbed by the demolition works	Heritage Branch of Department of Planning	EMR	N/A	N/A
<i>Threatened Species Conservation Act 1995</i>	PKC to prepare a Green and Golden Bell Frog Management Plan in coordination with NPWS which outlines management during and following the demolition works	National Parks and Wildlife Service	EMR	N/A	N/A
<i>Protection of the Environment (Operations) Act 1997</i>	The Site has an operational Environmental Protection Licence (no. 1753) which will require variation to incorporate the demolition works	Department of Environment and Climate Change and Water	Project Manager and EMR	As required following variation of existing licence	As required following review by NSW DECCW and variation of existing licence
<i>Contaminated Land Management Act 1997</i>	Remediation works already taken place under Voluntary Remediation Agreement (no. 26027). Demolition undertaken cognisant of past contamination issues, including retention of monitoring well network associated with Maintenance of Remediation Notice no. 28033.	NSW Department of Environment, Climate Change and Water	Project Manager, EMR	N/A	N/A



PKC SMELTER AND REFINERY

Regulatory Instrument	Licence/Permit/Approval/ Guideline/Plan	Responsible Regulatory Body	Responsibility for Ongoing Compliance Monitoring	Reporting Frequency/ Milestones	Report Content
<i>Environmentally Hazardous Chemicals Act 1985</i>	Management of chemicals required to be consistent with the Chemical Control Order for Scheduled Wastes (2004)	Department of Environment and Climate Change and Water	EMR	N/A	N/A
<i>Occupational Health and Safety Act 2000</i>	N/A	WorkCover NSW	EMR	N/A	N/A
<i>Occupational Health and Safety Regulation 2001</i>	Requirement to Hold a WorkCover NSW Unrestricted Demolition Licence. Asbestos removal to be carried out consistent with the <i>Code of Practice for Safe Removal of Asbestos (NOHSC, 2002 – 2005)</i> . Contractors to hold WorkCover NSW Bonded and Friable Asbestos Licences, as relevant.	WorkCover NSW	EMR	N/A	N/A
<i>Occupational Health and Safety Amendment (Dangerous Goods) Act 2003</i>	Licencing from Work Cover required, as per Project Approval Clause 11.	WorkCover NSW	EMR	N/A	N/A
<i>Waste Avoidance and Resource Recovery Act 2001</i>	Waste Management Plan, as presented in Section 5.2.6 of DMP.	Department of Environment and Climate Change and Water	EMR	N/A	N/A



4.3 Reporting and Stakeholder Consultation

4.3.1 Background

An Environmental Assessment (EA) prepared by PKC for Site Demolition was submitted to Department of Planning as a final on 8th April 2009. This document detailed the regulatory and environmental issues and potential mitigation options available for the management of these issues during and after the demolition works. As part of the pre-planning stage and the Environmental Assessment component, the following stakeholders were consulted:

- Landholders and community;
- Local businesses and service providers;
- Department of Environment, Climate Change and Water (then Department of Environment and Climate Change);
- Wollongong City Council;
- Roads and Traffic Authority;
- Office of Water (then Department of Water and Energy); and
- Port Kembla Port Corporation.

The NSW Department of Planning has also been consulted (through submission of the EA and ongoing liaison) and have provided their Project Approval requirements as a result (Application No. 08_0191, 15 August 2010).

4.3.2 Consultation During Demolition

In addition to the consultation which has already taken place, the project team will undertake the following during the course of the demolition project. The approach to community consultation outlined in the following sections is consistent with the approach outlined in the *Interim Construction Noise Guideline*, (DECC July 2009).

General Community Consultation

There are two active local community groups with which PKC has previously and regularly consulted in relation to environmental issues – the Port Kembla Copper Community Liaison Group (CLG) and Port Kembla Pollution Meeting. PKC propose to carry out meetings with both groups throughout the course of the demolition, at a frequency deemed appropriate by the various stakeholders. An initial meeting will be conducted 1 month prior to commencement of demolition activities. The meetings will focus on the progress of demolition and environmental management of the works. The meetings will be held on site.

Regulatory Consultation

Consistent with the requirements of the Environmental Assessment (EA, PKC 8 April 2009) and this DMP, reports will be prepared and issued on a monthly basis to document general progress of demolition, the results of air quality and noise monitoring and compliance with the Project Approval conditions (Application No. 08_0191, 15 August 2010).

The reports will be issued to the Department of Planning, Wollongong City Council and DECCW, and will also be made available to other regulatory agencies on request.

Annual return reports will be submitted to DECCW to comply with the requirements of the EPL (1753) for the site. This will include reporting of monitoring results from the WTP.



Activity-Specific Consultation

The following activity-specific consultation will be undertaken:

- The 200 m stack – the process and timing for notification of the local community for demolition of the 200 m stack will be determined in consultation with the CLG. However, it will occur at least 2 months prior to demolition and is likely to include an announcement in the local paper (Lakes Times), a letter drop and at least one community meeting will take place. This meeting is intended to include locally affected businesses and residents, along with agencies involved in administering the safe demolition of the structure including local police, ambulance, council members and the Illawarra District Emergency Management Committee. The meeting will outline measures to be implemented during demolition of the stack, requirements of the Illawarra District Emergency Management Committee and accommodation measures for residents and business workers who are required to relocate during the demolition of the structure.

General Enquiries

Community enquires and complaints can be made by phone on 4275 0200. This phone number will be placed on site boundary fences, circulated via the planned public meetings, letter drops and notices to the posted in the Lakes Times.

Dilapidation Surveys

Pre-demolition and post-demolition dilapidation surveys will be conducted on public roads, footpaths and gutters. The purpose of the surveys is to assess the pre-demolition and post demolition condition of these assets, and the extent to which repairs are required, as necessary. This survey will be conducted in consultation with Wollongong City Council, as required by the Project Approval (Application No. 08_0191, 15 August 2010).

Complaints Handling, Investigation and Resolution

PKC will undertake the following to respond to complaints lodged by the public in relation to the demolition project:

- Recording complaint: the complaint will be recorded on a dedicated Complaints Register. Each complaint will be given a unique reference number to allow tracking. A brief description of the complaint and the contact details for the person making the complaint will be recorded in the register, along with the date of the complaint.
- Understanding Complaint: to ensure PKC understands the nature of the complaint, the person that has registered the complaint will be called by the EMR to verify the nature and extent of the issue. Once this is understood, it will be recorded on the Complaints Register.
- Responding to Complaint: during discussions with the person making the complaint (see bullet point above), PKC will make an undertaking to respond within a given timeframe (not more than one week), The response will consist of:
 - An explanation of the likely source of the issue.
 - Corrective action to address the potential issue, as required.



- Investigating Complaint: once the nature of the complaint is understood, the EMR in conjunction with the PKC Project Manager and Demolition Contractor will investigate the potential source of the complaint. This will include assess the likelihood of recurrence, and if so, corrective actions to be undertaken, as required, to mitigate for future issues related the same activity.
- Closing Complaint: once the issue which was subject of the complaint has been resolved (to the satisfaction of the person that lodged the complaint), the complaint will be recorded as being closed on the Complaints Register. If the person is not satisfied with the explanation and actions (as required) put forward by PKC to address the complaint, then third party resolution with the relevant government authority (eg DECCW) may be required. Only the EMR has the authority to record a complaint as being closed.

4.3.3 Non-Compliance Reporting and Resolution

Environmental management measures for the demolition project are detailed in Section 5.2 of this DMP. There are methods of measurement and associated criteria, guidelines and parameters by which these environmental management measures are to be assessed (also detailed in Section 5.2).

It is the responsibility of the EMR to monitor the compliance of the project with the criteria and guidelines detailed in Section 5.2. Reporting of the results of the environmental monitoring will be included in the monthly reports to be issued to DECCW, DoP and WCC (see Section 4.3.2). However, should the environmental monitoring indicate non-compliance with the prescribed criteria, the following process will be carried out:

- Recording Non-Compliance: the non-compliance will be recorded in a dedicated Non-Compliance Register. Each non-compliance will be given a unique reference number to allow tracking. A brief description of the non-compliance will be recorded in the register, along with the date of the non-compliance.
- Notification of Non-Compliance: the Department of Planning and other relevant government authorities will be informed of non-compliance within 24 hrs of the non-compliance being recorded/recognised. The notification will also detail the actions being carried out by PKC to assess the nature of the non-compliance such that corrective actions can be implemented. The notification will also detail community consultation being carried out, if necessary
- Investigating Non-Compliance: within 24 hrs of the non-compliance being discovered, the EMR (in conjunction with the PKC project manager and the Demolition Contractor) will commence investigations to asses the nature and source of the non-compliance. This may include, but not be limited to:
 - Assessing the potential period of non-compliance and extent and nature of effects.
 - Review of activities and carried out on that relevant day and area of the site.
 - Review of environmental conditions.
 - Review of the operation of associated equipment, where applicable (eg environmental monitoring meters and truck wash bays).
 - Development of corrective actions to address non-compliance.



- Corrective Action and Closing Non-Compliance: once the non-compliance has been resolved through implementation of corrective actions, the relevant authority will be notified and the non-compliance will be recorded as being closed on the Non-Compliance Register. Only the EMR has the authority to record a complaint as being closed. As part of closing out of the non-compliance, a report will be submitted to the Department of Planning within 6 days of the non-compliance being identified. The report shall detail, but not necessarily be limited to, the following:
 - Date, time, and nature of the exceedance/incident.
 - Cause (or likely cause) of the exceedance/incident.
 - Actions taken at the time of reporting.
 - Actions to address the exceedance/incident.

4.4 Training

All employees shall undergo general environmental awareness training regarding their responsibilities under the DMP. The training will be developed to provide staff with the key obligations outlined in the DMP. It should be noted that “employees” in this instance means all people working on-Site including tenants, contractors and sub-contractors.

It is the responsibility of PKC and the Demolition Contractor to prepare Site-specific training, however as a guide, environmental training programme should incorporate the following:

- A general site induction;
- Familiarisation with the requirements of the DMP:
- Environmental emergency response training (outlining potential environmental emergencies and relevant contacts and response procedures), including spill management/response procedures;
- Familiarisation with Site environmental controls (bunded areas, spill kit locations, emergency gas valves, shut-off points etc);
- Protection and maintenance of heritage structures;
- Requirements for drivers hauling equipment and materials to and from site; and
- Targeted environmental training for specific personnel. For example, the EMR and Demolition Contractor may require specific training in spill management and compliance monitoring.

As part of the environmental training for the site, staff will be required to sit and pass a test aimed at assessing their understanding of their obligations under the DMP and general site induction. Each six months, staff will be required to carry out refresher training and re-sit the exam to assess their ongoing understanding of the project requirements.

The test papers and results will be retained by the EMR and a Training Register compiled as a record of training, and the currency of the training.

The need for additional or revised training shall be identified and implemented from results of:

- Auditing or monitoring programmes;
- Changes to the Site and surrounding receptors; and
- Alterations to regulatory frameworks and future reviews of the DMP as required.



Changes to the DMP (and obligations of site staff working under the DMP) will be communicated at daily project meetings between PKC and the Demolition Contractor. Changes in the DMP will be incorporated as addenda to the original plan.

It is the responsibility of the EMR and the Demolition Contractor to inform their respective staff of the changes to the DMP.

4.5 Emergency Contacts and Response

Table 2: Emergency Contacts

Agency/Organisation	Name	Phone
Project Team	Project Manager – Ian Wilson	(02) 4275 0200
	HSE Management Representative – Mike Tierney/Jim Bailey	(02) 4275 0200
	Community Liaison Manager – Ian Wilson	(02) 4275 0200
Department of Planning	Head Office	(02) 9228 6111
Department of Environment, Climate Change and Water	Head Office Pollution Hotline	(02) 9995 5000 131 555
Department of Environment, Climate Change and Water, Local Office	Environment Line	131 555
Wollongong City Council	General Enquiries	(02) 4227 7111
Sydney Water Corporation	Emergencies	13 20 90
SES	NSW Headquarters	(02) 4226 2444
Fire Brigade Ambulance Police	As Required	000 or 112 (mobile)



5.0 IMPLEMENTATION

5.1 Risk Assessment

The assessment of potential risks is essential to manage various aspects of demolition which have the potential to create adverse impacts to surrounding human and environmental receptors. The main steps involved in a risk analysis are: incident identification, consequence analysis, probability and frequency estimations, and lastly a quantitative risk assessment. The first three steps are considered in this DMP.

The potential environmental risks and management measures for demolition works at the Port Kembla Copper site are discussed in the following sections. The proposed demolition works will comprise three key components; the non-destructive removal of plant and equipment, felling of large structures (including some equipment) and the recovery or disposal of materials on-Site and off-Site. Table 3 (below) lists the environmental aspects associated with the demolition activities have been listed, and the potential environmental impacts identified. The potential risks have been rated from low to very high in accordance with the methodology outlined in the Australian Standard AS4360:2004 Risk Management (AS4360) and HB436:2004 Risk Management Guidelines Companion to AS4360:2004 (HB436).

The environmental risks have been classified by the matrix method outlined in HB436, whereby the likelihood and consequence of a risk are identified to produce a level of risk rating. The consequence and likelihood of an event is measured on a qualitative scale using Table 6.2, 6.3 and 6.4 in HB436. The level of risk of an event is then determined by combining the likelihood and consequence of an event, as detailed in Table 6.6 in HB436. This approach allows the potentially significant risks to be determined and assessed further.

Table 3 presents the risk rating of the project in an unmanaged scenario is shown, as well as the modified risk rating by undertaking the activities using standard safety, environment and management practices. These activities are described in Sections 5.2.1 – 5.2.8. The modified risk ratings have the potential to be further reduced through the course of the demolition by modifying work practices and/or implementation corrective actions identified during the work.



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Table 3 Potential risks from the project

Aspect	Activity	Impact	Original Risk Rating	Managed Risk Rating
Hazard and safety	Various demolition activities and structures	Serious injury or death of site workers and surrounding land users and occupants	High	Medium
Air emissions	- Dismantling equipment - Felling of large structures - Size reduction and sorting of demolition materials	- Potential release of dust into the atmosphere - Potential impacts on air quality, physical amenity and stormwater (through deposition)	High	Medium
Noise and vibration	- Operation of demolition equipment - Dismantling equipment by mechanical means - Felling of large structures - Size reduction and sorting of demolition materials	- Intrusive noise experienced off-site for the short periods of activity - Vibrations damaging off-site structures	Medium	Medium
Traffic and transport	- Moving dismantled equipment around the site for packing and consolidation before despatch - Transport of materials off site	- Spillage of material during transport impacting on stormwater or soil - Impact on road network and road safety	Medium	Low
Wastewater	- Washing down structures and equipment - Spillage of liquids from vessels, pipelines and demolition equipment - Washing recovered scrap	Generation and release of contaminated wastewater from the site	Medium	Low
Generation of waste	- Disposal of lubricants - Disposal of materials not able to be recycled - Disposal of hazardous building materials	- Potential for soil and groundwater contamination - Disposal of solid waste to landfill	Medium	Low



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Soil	- Dismantling and removal of equipment and structures - Felling of large structures - Transport and disposal of materials from demolition activities	- Generation of waste and spills potentially leading to soil contamination - Exposure of demolition personnel to the soil contamination present at the site	Medium	Low
Water usage	Consumption during washing down and dust suppression	- Use of potable water resources. - Use of treated water from the WTP	Low	Low
Energy and greenhouse	- Dismantling of equipment and demolition by mechanical means - Size reduction and sorting by mechanical means	- Energy consuming implements and equipment - Greenhouse gas emissions from consumption of fossil fuels	Low	Low
Visual amenity	- Removal of site structures - Demolition works	Probable overall improvement in visual amenity	Low	Low
Socio - economic	All demolition related activities	- Temporary increase in local employment - Potential for industrial renewal	Low	Low
Cumulative impacts	- Dismantling and removal of site structures, plant and equipment - Transport, size reduction, sorting and disposal of demolition materials	Potential combined impacts on the community and environment from the demolition works and neighbouring industries	Low	Low

Note: management of Hazard and Safety will be addressed in the applications to WorkCover NSW for a demolition work site permit, as they will describe the methodologies and management measures to be applied to demolition of specific site structures, including removal of hazardous materials.



5.2 Demolition Management Activities and Controls

5.2.1 Air Quality Management Plan

Associated Risks

The proposed demolition activities may result in the disturbance and release of dust. Residual dust from the former smelter operations, such as the smelter building, ventilation ducting, main stack, refinery and storage areas, may contain some residues from industrial processes or building materials. The release of the dust could adversely impact upon demolition personnel during the works as well as the local community, if not properly managed. In addition, the demolition of all buildings must be carefully managed to avoid the emission of hazardous substances such as asbestos, synthetic mineral fibres and acid mists (from the sulfuric acid plant)

Controls

Dust management will be carried out through the implementation of this Air Quality and Dust Management Plan. Dust management activities may include, but not necessarily limited to:

- Wetting down of structures and surfaces.
- Using covers and hessian sheeting.
- Sealing dust generating materials into bags.
- Use of damp sawdust.
- Good housekeeping procedures (ie placement of particulate matter within the Bulk Concentrate Store and away from site boundaries).
- Use of controlled demolition techniques.
- Use of a street sweeper to remove accumulated fine materials from internal roads and sealed areas.

In general, the contractor shall apply careful and incremental demolition methods to minimise emissions of particulates. Dust suppression and ongoing assessment of weather conditions during demolition including the prevailing wind direction and speed should further minimise the amount of particulate matter becoming airborne from buildings, structures and demolition activities. Demolition will aim to remove structures in a controlled pre-planned way to reduce dust release during the process.

The major factor influencing the movement of dust generated from the Site works to off-site areas will be the direction and strength of wind at the Site. Review of the historical records of wind speed and direction for the Port Kembla Signal Station (located approximately 1km from the site) has shown that the prevailing winds in the morning are from the west, south west and south. The prevailing winds during the afternoon are generally from the north-east, with the exception of the period between May and July, when the prevailing winds are from the south and west. The demolition of the structures on the Site will take place over conditions with varying wind directions and velocities.

The dust mitigation measures implemented on-Site will focus on the potential for wind conditions to entrain dust which may impact in off-Site areas, and will include:

- Maximising the amount of material handling undertaken inside the Bulk Concentrate Store, which will effectively eliminate off-site impacts of dust and noise;



- Limiting work performed on high wind days (work may be limited to non-dust creating activities if dust generation cannot be controlled) or on days when the prevailing winds could blow dust onto nearby residential areas;
- Dust screens at the perimeter of the site;
- All vehicles to use designated (sealed) roads;
- Enforcing a Site speed limit to minimise dust generation by vehicle movements;
- Dust suppression by water sprays and water carts on potential dust generating areas including demolition work areas, haul roads and stockpiles;
- Covering all truck loads (carrying loose material) on and leaving the site;
- Minimising the number of active demolition or work areas;
- Cleaning trucks and work vehicles prior to leaving the site;
- Regular inspection and maintenance of plant to minimise exhaust emissions;
- Use of portable PM10 dust loggers located downwind of localised demolition work areas. These portable PM10 dust loggers will not be used for compliance purposes but rather as a management tool for assessing the need and effectiveness for dust suppression; and
- Installing temporary covers, or spraying with a binding agent, on material stockpiled in outside areas, where necessary. Longer term stockpiles may require covering with either a HDPE or geomembrane material.

Odour mitigation measures to be implemented on-Site, if required, will include:

- Controlled removal to the extent possible of potentially odorous materials from the Site prior to demolition works commencing;
- Scheduling of demolition works in periods of favourable weather conditions;
- Relocation of potentially odorous material to stockpiles located away from sensitive neighbouring areas, and if safe to do so, within enclosed areas such as the Bulk Concentrate Store;
- Odour suppression by water sprays or odour suppressants, as required, over affected material;
- Installing temporary covers such as plastic sheeting, PVA sprays or foam barriers; and
- Adequate maintenance of equipment and plant to minimise vehicle exhaust emissions.

It is noted that generation of offensive odours during demolition is noted considered likely to occur based on the nature of the materials historically stored and handled on site.

Maintenance and Monitoring

An air monitoring program will be established for the area around the Site to verify that impacts during the works are maintained at acceptable levels. This will include a background monitoring program which will take place prior to the commencement of demolition to provide baseline air quality data for the area.

The monitoring program will, at a minimum, comprise the following elements, and is considered to be consistent with the requirements of *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007)*.



- Four air sampling stations, which will be located near the site boundaries in the vicinity of the demolition activities on the Site and adjacent to sensitive off-Site receptors in accordance with AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment. The receptors include residential and commercial areas to the south and west, government offices (court house and police station) to the north-west, and an industrial complex (Metal Manufacturers) to the east. The proposed locations of the air monitoring stations are illustrated in the figure attached in Appendix C.
- The locations of the air sampling stations will be reviewed and may be amended as the works progress. This could include additional monitoring locations within the residential areas down wind of the Site to assess off-site impacts if the results of monitoring at the boundary locations are above the air quality targets. The locations of the air sampling stations will comply with the requirements of the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007);
- Monitoring at each air sampling station will be for dust deposition, TSP, PM10 and metals (arsenic, antimony, cadmium, copper, lead, mercury, vanadium and zinc). Monitoring of TSP, PM10 and metals will be conducted for 24 hour periods on a 6 day cycle, whilst monitoring of dust deposition will be conducted on a monthly cycle. Neighbourhood dust deposition monitoring locations currently monitored by PKC will be included in the sampling program.
- Boundary monitoring for airborne asbestos fibres during asbestos removal works on weekly cycle. This monitoring will be carried in accordance with Guidance note on membrane filter method for estimating airborne asbestos fibres 2nd edition (NOHSC:3003, 2005).;
- Meteorological monitoring to allow the monitoring results to be assessed in the context of prevailing wind conditions and strength during the period of monitoring. The proposed location of the meteorological station is illustrated in Appendix C; and

The following data will be recorded at a minimum at the time of each deposition gauge replacement:

- Date and time;
- Funnel diameter;
- Condition of the dust gauge;
- Compliance with the requirements of AS/NZS 3580.1.1:2007;
- Activities in the general area not associated with the demolition works; and
- Any other activities or conditions in the vicinity of the monitoring location.

These records will be compiled and retained by the EMR for use in subsequent reporting.

Samples from the dust deposition gauges will be analysed in accordance with AS/NZS 3580.10.1:2003 for insoluble solids, combustible matter and ash. Samples collected from the TSP and PM-10 monitors will be analysed using methods which are consistent with *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC 2007)*. Dates and times of TSP and PM-10 sampling, along with a description of environmental conditions and site activities for each sample interval will be recorded and retained by the EMR for subsequent reporting.

A summary of the dust monitoring results, including an analysis of the monitoring results against the assessment criteria (refer to Table A in Appendix D) and comparison with historical monitoring results, will be presented in the monthly reports issued to DECCW, Department of Planning and Wollongong City Council.



Portable PM₁₀ dust monitors will be used to supplement the results from permanent monitoring stations during demolition. These portable PM₁₀ dust loggers will not be used for compliance purposes, but rather as a management tool for dust suppression. The location of the portable PM₁₀ dust monitors will be varied according to location of the Site works, the nearest sensitive receptor and the forecast daily wind conditions. Whenever used, the time, date and results from the portable dust monitors will be recorded, along with the activities being monitored. If the monitoring is being carried out to assess the effects of corrective actions, this will also be noted. These records will be retained by the EMR for subsequent reporting.

Odour assessments will be performed by persons who are qualified odour assessors in accordance with AS/NZS 4323.3: 2001 *Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry*. Weekly assessments will be performed at the proposed air sampling locations and the results presented in the monthly summary reports. The time, date and location of the odour assessments will be recorded, along with a description of the activities being carried out on site at the time of the assessments. These records will be retained by the EMR for subsequent reporting.

Acceptance criteria for air quality monitoring are based on values from the *National Environment Protection (Ambient Air Quality) Measure* (amended in 2003) (NEPC) and *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC 2005). These criteria are listed in Table A (Appendix D).

In addition to the monitoring data, instrument calibration and maintenance will be carried out in accordance with the manufacturer's specifications. Records of calibration and maintenance will be retained by the EMR for subsequent reporting.

PKC will prepare a monthly summary report outlining the results of the air quality and odour monitoring. The report will also provide explanation for above-criteria results that may be reported, and mitigation measures implemented as a consequence of these results (should they occur). This report will be issued to DECCW, Department of Planning and Wollongong City Council.

Contingency Plan

Where consistent exceedances of the guidelines occur, consideration will be given to the following to mitigate potential impacts to off site receptors:

- Use of increased suppression technologies for dust issues.
- Use of odour mitigating products (such as aerial sprays and application of products on stockpiled materials).
- Rescheduling works and review of demolition techniques.

A specific air quality management plan will be prepared for the 200m stack demolition to address the specific potential impacts and to assess what control measures are most appropriate to reduce air quality impacts to acceptable levels.

5.2.2 Noise and Vibration Management Plan

Associated Hazards and Risks

Noise and vibration will be generated from the proposed demolition activities have the potential to adversely impact upon surrounding occupants and infrastructure. Previous mitigation works which were implemented at the Site will assist in minimise impact on neighbouring residence, including the noise barrier along the south eastern boundary of the site.



Truck movements for the demolition activities are unlikely to make a material impact on noise due to the exclusive use of Darcy Road for all heavy vehicle movements (which is already a thoroughfare for heavy vehicles). The number of truck movements is expected to be between 40 and 50 per week on average. This is understood to be considerably less than the truck movements during PKC's operational phase and therefore the potential for adverse noise impacts associated with truck movements are considered likely to be low.

Controls

Noise Controls

The following represent the noise limits imposed by the Department of Planning for the project:

- The noise from the project does not exceed the noise goal of 60 dB(A) (LAeq(15 minutes)) at the nearest affected residential receiver during the day;
- The overpressure level from blasting operations associated with stack demolition does not exceed 120dB (Lin Peak) at the boundary of the Safety Management Zone and nearest potentially affected residential/sensitive receptor.

The mitigation and management of noise impacts will be an important part of the demolition programme. Measures that will be adopted include the following. These measures are considered to be consistent with those outlined in the *Interim Construction Noise Guideline (DECC, July 2009)*. A copy of this guideline will be retained on site by the EMR for reference and use, as required.

- Specific positioning of certain activities on the Site (eg concrete crushing to be undertaken within an enclosed building);
- Control of work practices to reduce noise;
- Strategic planning of demolition work to maximise noise shielding by buildings. This includes general staging of demolition to take place from the north-east and moving towards the south-west of the site for as long as possible;
- Silencing, regular maintenance and modification of treatment of equipment to reduce noise emissions;
- Internal traffic management to minimise noise associated with reversing alarms, such as the design and use of circular drop-off areas to minimise the requirement for vehicles to reverse;
- Hours of operation – including undertaking specific activities within set hours only (see below) ; and
- Consultation and liaison with potentially affected residents and businesses where elevated levels of noise are expected (refer to Section 4.3.2)

The hours of operation for demolition works are prescribed by the Department of Planning as:

- 7.00 am to 6.00 pm, Monday to Friday
- 8.00 am to 1.00 pm, Saturday
- No work Sundays or Public Holidays, except in special circumstances and with approval.

PKC will implement a programme of community consultation to keep local residents and businesses aware of demolition activities (see Section 4.3.2). When and where potentially noisy activities may occur, residents will be consulted and arrangements made to undertake specific tasks at times to minimise the potential inconvenience.



Site managers will be made aware of noise limits and locations of the most potentially affected receivers or residents. Workers on-Site will also be made aware as part of their general environmental awareness training and site induction. They will be made aware of the specific measures and procedures to be implemented to control noise emissions, and management actions to be followed where potential noise disturbance is likely to occur. Affected residents will be provided with contacts (refer to Section 4.3.2) where they can make comment or register complaints.

The number of truck movements off site is expected to be less than 10 truck movements per day, which is less than when the Site was operational. Additionally, these movements will occur only via the Darcy Road entry, and the existing weigh-bridge and truck-wash bay at the northern end of the Site. This will reduce the potential for local noise impacts associated with off site traffic movements and truck noise since Darcy Road (which is the access road to the northern part of the Site) is a major heavy vehicle route to the Port Kembla port area and other industries, and is distant from most residential and sensitive noise receivers.

Vibration Controls (200m Stack)

As indicated in the EA (PKC, 8 April 2009), demolition of the 200 m stack is considered to be the main source of potential ground vibration resulting from the demolition works. Accordingly, vibration controls and monitoring (with the exception of the dilapidation surveys) will be limited to the stack demolition component of the works.

In terms of vibration from the stack demolition, advice from the specialist engineers indicates that the vibration from the explosive charges will be less than 1 mm/sec (peak particle velocity), as they will all be placed above ground level. Calculations of ground vibration from the stack falling on the ground indicate peak particle velocities of 4.5 mm/sec at 200 metres (using the worst-case variable for ground condition). This is considered acceptable compared with appropriate guidelines, such as:

- Explosives Engineering Handbook recommends less than 10 mm/sec for low rise residential areas; and

The ground vibration peak particle velocity from blasting operations (and other project works) is prescribed in the Project Approval conditions to not exceed 10 mm/sec at the boundary of the Safety Management Zone, as measured at a residential or other sensitive receptor.

The stack demolition will be a major event which will involve significant disruption in the local area, and an appropriate Safety Management Zone will be enforced for the public including local residents. For this reason, the impacts of noise and vibration are not expected to cause harm to persons in areas where they are permitted to be at the time.

Maintenance and Monitoring

As part of the noise management on the Site a noise monitoring programme will be implemented which will involve regular unattended noise monitoring at a minimum of 4 locations along the Site boundaries to:

- Assess the potential impacts of the demolition on nearby sensitive receivers;
- Assess compliance with the conditions of consent; and
- Allow corrective measures to be implemented if unacceptable noise levels are generated.

Continuous logging of noise levels would be conducted at the unattended locations, whilst periodic (discrete) attended monitoring would be conducted at other locations to:

- Assess the impacts of tasks which have the potential to generate significant noise emissions; and
- Investigate sources of excessive noise and/or community complaints.



The time, date and location of attended noise monitoring, along with the activities being carried out on site (and possibly off site) will be recorded and the results retained by the EMR for subsequent reporting

The results of the monitoring would be reported on a monthly basis, including corrective actions implemented to address noisy activities.

Current locations for unattended noise monitoring stations are illustrated in the figure attached in Appendix C. The locations may be altered over the course of the project to reflect the locality of demolition works.

As stated in Section 4.3.2, dilapidation surveys of public assets within the area immediately surrounding the Site will be conducted prior to demolition to allow an objective assessment of whether the vibration from the felling of the stack (and other demolition activities) has affected the integrity of these structures. Surveys of potentially affected private infrastructure may also be carried out.

As part of the assessment of vibration risk as a result of the stack demolition, PKC will install vibration loggers at three points at the boundary of the Safety Management Zone (to be located based upon at or adjacent to sensitive receivers). These will be used to monitor ground vibrations resulting from the stack demolition. The information provided by this monitoring will compliment the findings of the dilapidation surveys and allow PKC to gauge the likely impact of the demolition works on off-Site receivers. The specific details of the locations and types of vibration monitors will be detailed in the stack demolition plan.

The time, date, locations and results from the vibration monitors will be recorded and retained by the EMR for subsequent use in reporting.

In addition to the monitoring data, instrument calibration and maintenance will be carried out in accordance with the manufacturer's specifications. Records of calibration and maintenance will be retained by the EMR for subsequent reporting.

Contingency Plan

Where exceedances of the noise guidelines are likely or have been found to occur, consideration will be given to the use of portable acoustic barriers or screens to provide some noise reduction in these cases. Different methods and staging of demolition will also be explored.

A specific noise management plan will be prepared for the 200m stack demolition to address the potential noise impacts and to determine what control measures are most appropriate to reduce noise impacts to acceptable levels.

5.2.3 Traffic Management Plan

Associated Hazards and Risks

The proposed demolition works will generate some traffic above current levels to transport waste, recyclable materials, demolition equipment, and from the temporary increased staff and contractor numbers on-Site. The local road network was adequate to carry the higher levels of traffic during smelter operation. Consequently, and the traffic generated by this project is considered unlikely to have an adverse impact on the network's capacity.

The trucks travelling to (and from) the Site would travel along Five Islands Road, Flinders Street, Old Port Road and Darcy Road, and would therefore be travelling exclusively through industrial land use areas which are unlikely to be affected by truck noise. Haulage along these routes is also unlikely to affect pedestrian safety and movement.



A short-term road closure will be necessary while the main stack is being demolished (approximately half a day) to establish the Safety Management Zone. This will be targeted for a weekend so as to minimise the impact on residents and businesses.

The other potential risk on the local road and traffic network is the loss of site materials onto site roads, which could affect the use of the roads and have an adverse impact on local stormwater quality.

Controls

The additional number of truck movements resulting from this project will be temporary in nature. The actual number is not expected to exceed, on average, 10 movements per day. However, the number on any given day may vary depending on the following factors:

- The amount of demolition equipment being floated to and from the site;
- The proportion of material which will need to leave the site for sale or disposal, and that which can be reused on site for other purposes, such as fill; and
- The extent to which trucks can be back loaded to minimise the number of movements.

As with the current consent, entry and exit to the site by heavy vehicles will be via Darcy Road only, and will occur during the hours of operation for the site (described in Section 5.2.2). Site vehicles and trucks will not be permitted to park or queue along public roads.

All vehicles exiting the site will be required to pass through a truck wash and weighbridge facilities, near to the Darcy Road exit (see Figure 2). Daily inspections of public roads used by site vehicles will be made and logged by site security staff to assess whether soil is being tracked off site, and accordingly the effectiveness of the truck wash. Records of inspections will be retained by the EMR for subsequent reporting.

All oversize vehicles required for the project will obtain the appropriate permit from the RTA prior to travelling to and from the site.

Stack Demolition Event

The traffic management strategy for the single stack demolition event will also be detailed in the plan prepared specific for the stack demolition. However, roads within the Safety Management Zone of the stack will be closed for the duration of the stack demolition. A Traffic Management Plan will be developed in conjunction with the RTA, Wollongong City Council, NSW Police and an RTA-approved traffic control contractor.

The area within which roads will be evacuated is the Safety Management Zone. This will be determined as part of the preparation of the plan for demolition of the stack, and will ensure that there are no persons present within at least a 200 metre radius of the base of the stack.

The parts of roads which will fall within this zone will be temporarily closed. These are likely to include:

- Military Road
- Electrolytic Street
- Reservoir Street
- Third Avenue
- Church Street



The duration of the closure will depend on the potential risk of harm to nearby persons as a result of the stack demolition event. This will likely be in the order of 4 hours.

Wollongong City Council and local residents and businesses will be advised of the work, as described in Section 4.3.2. Appropriate warning and detour signage will be used, diverting traffic onto suitable alternate traffic routes.

Contingency Plan

The following contingent actions will be implemented where non-compliance with the above listed goals and approaches occur:

- Haulage Route – if road closures impact upon the planned haulage route, an alternate route will be planned in consultation with the RTA. The alternate route will use roads suitable for the likely vehicle types and seek to minimise on impacts to local residents.
- Queuing and Parking on public roads – if this occurs, a review will be conducted of on site parking facilities and plant required to be on site at any given time.
- Tracking of materials onto public roads - where materials are found to have been deposited on the road, the demolition contractor shall employ a street cleaner to remove the material. Additionally, the condition of on site roads and the operation of the truck wash shall be reviewed and upgraded, as appropriate.

5.2.4 Demolition Heritage and Monitoring Well Management Plan

Associated Hazards and Risks

As indicated in Section 2.2.1, the following structures located on Lot 21 have heritage significance and therefore require management and protection during demolition:

- Precious metals stack; and
- Old Assay Building.

The locations of these structures are illustrated in Figure 2.

The Assay building in Lot 21 will be the site office for PKC staff during demolition and therefore the day-to-day risk of damage to this building is considered to be generally low. The Precious Metals Stack located in the northern portion of Lot 21 is distant from the main demolition activities, and is therefore unlikely to be damaged.

Demolition of the 200 m stack presents the main potential risk of damage to the heritage structures. Since both structures are outside of the probable fall zone for the stack, potential for damage is related to flying debris following the stack hitting the ground.

Key monitoring and extraction wells are required to be protected for the purpose of future groundwater quality monitoring and potentially remediation.

Controls

The potential for damage to the Site heritage structures will be managed using the following approaches:

- Day-to-day controls (not associated with stack demolition):
 - Communication of the heritage status of the Precious Metals Stack and Old Assay Building to site staff and contractors during site inductions and DMP training.



- Creating an exclusion area (permanent or temporary fencing) and placement of signage around the Precious metals stack
- Placement of signage around the Assay building and habitation/use of the building as a site office.
- Stack demolition:
 - Placement of protective structures between the fall zone of the stack and the heritage structures, consisting of stacked shipping containers or the like.

Protection of the monitoring and extraction wells will consist of marking and covering the wells heads with protective plates to mitigate the potential for damage during demolition. Well heads which are currently above the ground level may be required to be cut down to the ground surface, retro-fitted with covers flush with the ground surface, and covered with plates for protection.

Maintenance and Monitoring

Monitoring and maintenance of the day-to-day controls for protection of the heritage structures will consist of:

- Weekly inspection of the presence and condition of fencing and signage placed around the heritage structures. These inspections will be logged and maintained by the EMR for subsequent reporting.
- Repair and replacement of the fencing and signage, as required.

Monitoring and maintenance associated with the stack demolition will include:

- Carrying out dilapidation surveys before and after demolition of the stack.
- Inspection and cataloguing (including photographs) of the protective measures placed around the heritage structures.
- Carrying out repairs to the structures based on damage which may have occurred as a consequence of demolition. The extent of damage will be assessed based on the pre- and post-demolition dilapidation surveys.

The general condition of the monitoring and extraction wells will be assessed monthly, with additional (specific) inspections carried out prior to and following demolition of structures located in the vicinity of monitoring and extraction wells. The inspections will include assessment of the need to retro-fit the wells to protect them from damage during demolition. The date, time and monitoring wells subject to inspection will be recorded on an inspection log which will be retained by the EMR. The need for retro-fitting will also be noted on the log for follow-up action by the EMR.

Contingency Plan

Contingent actions (imposed where existing controls prove to be ineffective) can only be applied to the day-to-day controls – they can not be applied to one-off events such as the stack demolition. Potential contingent actions may include:

- Increasing the type, height and/or security applied to the fencing placed around the Precious Metals Stack, where the existing fencing is found to be consistently breached.
- Increasing the fenced area around the Precious Metals Stack where site traffic or works are found to be encroaching on the structure and risking potential damage.
- Increasing the amount of signage and level of education to site workers where there is insufficient recognition of these structures as heritage items requiring protection. The level of education could be assessed as part of site inductions tests and refresher tests.



The Office of Water will be informed of monitoring or extraction wells which are damaged during demolition and are either decommissioned or replaced.

Additional Information

Further information relating to the management of heritage structures on the site is included in the report *Port Kembla Copper Smelter Demolition Heritage Management Plan* (Sue Rosen & Associates, 14 October 2010).

5.2.5 Soil and Water Management Plan

Associated Hazards and Risks

Wastewater will be generated from the hosing down of equipment and scrap materials, and may also be generated from spillages of water and rinsates from plant and equipment. The wastewater may contain heavy metals and contaminants from the former smelter operations at the Site, or from hazardous building materials such as asbestos. Given that the Site is capped and surface runoff is directed to the WTP, there is little potential for potentially contaminated stormwater and wastewater to escape to the surrounding environment.

One pathway for escape of potentially contaminated stormwater and wastewater from the site is the stormwater drain network which currently conveys clean rainwater falling on the site building roofs directly to the external council network (bypassing the WTP). These drains will be blanked off with concrete plugs (or the like) immediately prior to demolition of the relevant structures to mitigate movement of potentially contaminated stormwater and wastewater into council network (without prior treatment at the WTP). The locality of these drains will be mapped, with each entry point given a unique reference number for tracking. The demolition contractor will be required to record on a log sheet (to be provided to the EMR) the following information:

- The location of the drain point and its reference number;
- The time and date when blanking off the line was completed; and
- The method applied to blanking the line.

The EMR will inspect and sign off the log sheet prepared by the demolition contractor prior to demolition of the relevant building structure.

The conditions leading to the generation of wastewater on the Site during demolition is analogous to the conditions when the Site was operational, where the following activities/events would have resulted in the generation of wastewater requiring treatment at the Water Treatment Plant:

- Washing down of plant and equipment at dedicated wash bays;
- Plant upgrades and replacement; and
- General runoff from Site during rainy periods.

During the operation of the Site, these activities would have generated in the order of 20 m³ per hour of sulphuric acid of 7 percent concentration (equivalent pH of less than 1). The demolition project is expected to generate orders of magnitude less than this amount and quality for its duration.

There is a bunded area around the former above ground diesel fuel tanks (to the north of the sulphuric acid plant). The small amount of water collected within this bund is likely to be contaminated by diesel. These tanks and bunds will be removed at the earliest possible date to mitigate future generation of stormwater contaminated with organic compounds.



Another potential risk to stormwater quality on site is loss or spillage of oils and fuels on site during refilling and maintenance of plant equipment. However, it is anticipated that for the purposes of the demolition, only small amounts of lubricants will be stored on site; fuels will not be stored on site, but rather mobile tankers brought in to refuel plant equipment. Lubricants will be stored undercover and on sealed, bunded ground, whilst refuelling will be conducted in the bunded area located near to the Bulk Concentrate Store building.

Controls

Wherever possible, uncontaminated stormwater will be separated from potentially contaminated stormwater and diverted directly to council drains in order to minimise the increases in site stormwater flows, Wastewater Treatment Plant (WTP) treatment costs and energy consumption. Additionally - and wherever possible - potentially contaminated demolition materials will be stored undercover (eg within the Bulk Concentrate store) to minimise the potential for contamination of stormwater and increases in the sediment load within the water being directed to the WTP.

The WTP has the capacity to manage the stormwater flows during the demolition project. During operation of the Site as a copper smelter and refinery, the WTP treated approximately 30 m³ of process water and stormwater per hour, 24 hours per day, 7 days per week. The vast majority of this water was process water, which was also more contaminated than the stormwater (for example, the acid content of the process water was approximately 7%). Currently, the WTP treats approximately 20 m³ of stormwater per hour for 6 hours per week, which equates to the WTP operating at approximately 2.5 % of its full capacity. Therefore, even if the volume of stormwater requiring treatment was to double following demolition, there would be ample capacity (approximately 95%) at the WTP to treat this additional volume of water.

Other potential effects of demolition include increases in:

- Overland stormwater flow; and
- The amount of suspended material present within the stormwater flows.

Demolition of buildings will result in stormwater which was previously directed into council drains to be captured by the Site's stormwater system. This additional flow will be via temporary overland channels, gutters and pathways constructed for the duration of the demolition works as per the requirements of the *Managing Urban Stormwater: Council Handbook (NSW EPA, 1998)*. Additionally, incidental and temporary blocking of grated surface drains with demolition debris is likely to cause a reduction in the volume of surface water conveyed to the detention pits via internal subsurface drains, and a consequent increase in overland flow. Every effort will be made to keep these grated surface drains (connected to the WTP) open and functional through the course of the demolition works. This will be achieved by regular maintenance (removal of accumulated debris) and protection (covering with a metal plate or the like) during demolition of adjacent structures).

A large amount of fine to coarse debris will be generated during demolition. Whilst sweeping, collection and containment/disposal of this material will be undertaken as soon as possible, and to the extent practicable, it is likely that the amount of suspended solids in surface water will increase during and for a period following demolition. The effects of the increase in suspended solids in stormwater may include:

- Reduction in water storage capacity of the detention pits; and
- Increased operational costs for the WTP from increased flocculant dosing (to remove the suspended fines) and more frequent maintenance (cleaning) of the WTP settlement pond.

Neither of these potential effects is considered likely to impact on management of Site stormwater since both can be addressed through maintenance programs and amendment to the treatment process.



The sealed area of the Site will remain approximately the same following demolition of the Site. Consequently, management of contaminated groundwater under the Site (through mitigation of recharge) will be maintained following demolition and exposure of contaminated groundwater is unlikely. Groundwater under the Site will not be used for any purpose during demolition.

Water which collects on site and is treated at the WTP will be discharged into a large concrete-lined council drain, licenced under the EPL (1753) for the site. Given the treatment process at the WTP and the nature of the drain into which the treated water is discharged, stormwater released from the site is unlikely to cause erosion or sediment of the receiving waterway.

Spill kits will be maintained on site to assist in managing potential leaks of fuels and oils (should this occur) from plant equipment or oil/lubricants storage areas.

Maintenance and Monitoring

Monitoring the performance of the water management systems will include:

- Assessing the capacity of the existing drainage and storage infrastructure to manage flows generated during and following demolition. This includes monitoring for breaches of surface drains, off site flows and storage capacities of the five detention pits; and
- Monitoring the quality and quantity of treated water discharged to the stormwater culvert from the WTP in accordance with the requirements and limits prescribed in the existing Environmental Protection Licence (EPL).

Pre-existing and temporary stormwater and runoff management structures are to be monitored and logged weekly by the EMR to ensure the ongoing effectiveness of these structures. If, following runoff events it is found that some parts of the infrastructure are ineffective in managing stormwater runoff these parts are to be re-designed to meet the specific Site parameters. If infrastructure is found to be damaged or inoperable repairs will be scheduled. The ongoing effectiveness of the infrastructure and any repairs or additions required will be documented by the EMR and retained for subsequent reporting.

The WTP will undergo ongoing monitoring as per the specifications for the plant model. Monitoring of the output from the WTP will be conducted as per the requirements of the existing EPL for the Site. The findings of this monitoring along with details of any non-compliance will be provided to the NSW DECCW as part of the Annual Return documentation for the Licence.

Contingency Plan

If sediment within the stormwater detention pits and Wastewater Treatment Plant settling ponds requires removal and off-Site disposal, the material will be sampled and analysed for the contaminants of concern (as specified in the Environmental Assessment) and classified for disposal using the guidance outlined in the Waste Classification Guidelines (DECC, 2008).

If monitoring indicates that upgrades to the stormwater management infrastructure (Site sealing, drainage and Wastewater Treatment Plant) are necessary, these works will be implemented as soon as possible to mitigate possible future issues/uncontrolled releases and ensure ongoing compliance with the conditions of the EPL.



5.2.6 Waste Management Plan

Associated Risks

Waste generated on-Site during the demolition works includes lubricants from Site plant, materials unable to be recycled, hazardous building materials (asbestos, PCB containing materials and lead-based paints) as well as general refuse generated from Site works. These types of waste have the potential to impact upon the health of on-Site personnel, visual amenity and soil and groundwater quality on-Site. These wastes also have implications for off-Site disposal and waste classification which can impact significantly upon tipping fees.

Controls

General

PKC has initiated detailed assessment of the types of wastes that will be generated from the demolition project. These include:

- Brick;
- Concrete;
- Ferrous and non-ferrous metals (including rebar);
- Timber;
- Special waste (asbestos);
- Other hazardous wastes (e.g., synthetic mineral fibre, possible PCBs);
- Smelting concentrates, residues and dusts;
- Demolition process wastes (e.g., cleaning effluents, lubricants and oils...);
- Other building materials (e.g., felt, insulation, foams...); and
- General rubbish.

The wastes generated from the decommissioning and demolition works will be assessed and managed in accordance with the NSW DECC's *Waste Classification Guidelines (2008)* and the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* (2008 No 109). The following sections describe the approach to assessment and management of the various waste types likely to be present on site.

General Solid Waste (Non-Putrescible)

As part of the waste minimisation and sustainability strategy for the project, general solid waste such as brick and concrete are proposed to be used as engineered fill to backfill pits and sublevels (depressions left by the demolition of structures) or recycled for other off site uses. These wastes (see Recycling below) will undergo validation or classification by laboratory testing to assess their suitability for reuse on site or recycling off site. General solid wastes of this type will either be classified as fit for use as on-Site fill or for off site recycling; or if unsuitable for these uses, disposed of at an off-site licensed facility in accordance with their classification.

The general solid waste material will be sampled at a rate of 1 sample per 400 m³ of material to assess its suitability for reuse/recycling or disposal requirements (if not suitable for reuse). As a minimum, the samples will be analysed for the following chemicals, plus any others considered relevant to the material being assessed - arsenic, antimony, cadmium, copper, lead, mercury, vanadium and zinc. The analytical suite will be developed by the EMR.



Hazardous Waste

A site-specific hazardous substance and materials survey has been carried-out as part of the decommissioning process (GETEX, 2009). A copy of the hazardous substance and materials survey report will be provided to the Demolition Contractor before demolition works. Hazardous substances and materials will be managed as part of the decommissioning process throughout the demolition works. The wastes will be removed, where possible, from the structures prior to demolition. Identified hazardous waste will be managed and disposed of as per the applicable regulations for each waste and in accordance with the NSW DECC's *Waste Classification Guidelines* and the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* (2008 No 109). The approach to removal and handling of hazardous wastes will be detailed in the applications to WorkCover NSW for a demolition work site permit.

Special Waste

An asbestos register exists for the site and a supplementary assessment was conducted as part of the decommissioning process prior to the demolition works (GETEX, 2009). A copy of this survey will be provided to the Contractor(s) before asbestos removal and demolition works commence. Asbestos shall be removed, where possible, from the structures prior to demolition. An occupational hygienist will be engaged by PKC to survey the site following asbestos removal works. This survey will be guided by the existing asbestos register. The findings of this report, including the locations of possible residual asbestos, will be provided to the demolition contractor so works can be planned accordingly.

Identified special wastes will be managed and disposed as per the applicable regulations for each waste and in accordance with the NSW DECC's *Waste Classification Guidelines* and the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* (2008 No 109). The approach to removal and handling of asbestos will be detailed in the applications to WorkCover NSW for a demolition work site permit.

Liquid Wastes

The presence of liquid chemicals is expected to be limited at the site (pipes, vessels, containers and tanks have already been purged and cleaned of chemical liquids). Chemicals that may be present at the site are generally limited to potential acidic residues in pipes and tanks as well as catalyst residues which have previously been emptied and cleaned. Transformer oils are present and will be disposed of off site according to their composition. The type and quantity of chemicals that may be present in the site process plant and equipment were assessed in the hazardous substance and materials survey (GETEX, 2009).

Identified chemicals (liquid wastes) will be managed and disposed of off-Site as per the applicable regulations for each waste and in accordance with the NSW DECC's *Waste Classification Guidelines* (DECC 2008) and the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* (2008 No 109). Liquid wastes of unknown composition will be sampled for laboratory analysis to assess the requirements for management and disposal.

Recycling

PKC will recycle waste streams produced by the demolition process where the intended use of recycled material is assessed as suitable from a material and environmental standpoint. The suitability of the material will be assessed by sampling and laboratory testing (see above section on General Solid Waste for sampling densities).



On-Site Recycling for On-Site Use

The site will see the production of depressions on the land following the removal of buildings, sublevels, basements and pits. PKC intends to infill these areas with an engineered fill that will meet future construction requirements. Brick and concrete from demolition activities that meet the appropriate environmental criteria are anticipated to be used for this purpose. These materials will be crushed, regraded and stockpiled on-site for use as a component of the engineered fill. This will significantly reduce the volume of 'virgin excavated natural materials' being imported onto the site for this purpose and significantly reduce the volume of inert waste that may be disposed of to landfill.

Off-Site Recycling and Resale

If the materials meet the appropriate environmental criteria, brick, concrete, timber and plastic are to be recycled (sold) at off-site locations. The receivers of such materials will be required to demonstrate their capacity, licensing and accreditations that they may be obliged to have to receive and undertake such recycling activities for these materials.

The recycling (sale) of ferrous and non-ferrous scrap metals is a key financial component of the works. Particular emphasis concerning the segregation, sorting, stockpiling, sizing and transport to scrap metal merchants will be given to this item. Assets such as major plant and equipment that cannot find buyers will be recycled as scrap metal.

General Management of Waste

The handling, sorting and temporary on-site storage and transport of the waste streams will incorporate procedures and systems required by the OH&S Act and other relevant H&S guidelines (e.g., WorkCover) for the safe management of waste. During the works, toolbox meetings will be held by the demolition contractor and PKC, where waste management items will figure on the agenda.

Assessment of the quality of waste materials will incorporate standard protocols for sampling and analysis of environmental media. These protocols will be developed by the EMR based on the nature and source of the materials, but as a minimum shall incorporate the following:

- Discussion with site staff in relation to the nature of activities and chemicals used in the assessed structure(s) (to assess a suitable list of potential contaminants of concern).
- Unique labelling of material stockpiles/liquid streams and samples to allow effective material tracking and cross referencing of results;
- Use of dedicated sampling (eg disposal gloves) and/or decontaminated equipment;
- Use of laboratory supplied bottles;
- Placement of samples on ice during storage and transport to the analysing laboratory;
- Use of chain of custody procedures for sampling tracking.

Collection, tracking and analysis of the material and liquid samples will be undertaken or overseen by the EMR. The EMR will review the physical and chemical nature of the materials and assess the suitability of material to remain on site or be disposed of off site for recycling or to a landfill or liquid waste treatment facility.

The EMR will retain the following materials management records:

- Waste materials/liquids, source and (unique) name of waste material/liquid;
- Volume of stockpiled material/liquid waste;



- Number of samples collected for assessment of waste;
- Classification of material;
- Fate of materials (ie location placed on site or recycling facility/landfill to which it was disposed).

Samples will not be collected until the waste has been cordoned off/signposted so that no further waste is added.

A materials tracking form will be required to be signed off by the EMR before the material is able to be re-used on site or removed off site. Receipts from recycling depots, landfill and liquid waste facilities which receive materials from the site will be retained by the EMR.

As indicated in Section 5.2.5, and wherever possible, general waste and in particular potentially contaminated demolition materials will be stored undercover, preferably in the Bulk Concentrate Store.

Waste from other properties will not be accepted at the site.

5.2.7 Green and Golden Bell Frog Management Plan

Associated Risks

The GGBF is listed as an Endangered Species under Schedule 1 of the NSW *Threatened Species Conservation Act 1995*, and Vulnerable under Schedule 1 Part 2 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Port Kembla has the most significant population of the Green and Gold Bell Frog (GGBF) remaining in the Illawarra region of southern New South Wales (GAIA, 2010). The *Management Plan for the GGBF Key Population at Port Kembla (DEC 2007)* was drafted with the aim of conserving the remaining population of GGBF in this area of NSW. This 2007 plan complements the existing Green and Golden Bell Frog *Litoria aurea* (Lesson 1829) Recovery Plan (DEC, 2005).

A survey conducted in November 2008 did not find GGBF tadpoles or frogs on Site. However, they have been identified adjoining and nearby industrial sites (GAIA, 2008). Given their potential presence on site and their endangered status, this management plan has been prepared to guide site workers on how to identify and manage GGBF and their potential habitats on site.

A picture of a GGBF is attached in Appendix E for reference.

Maintenance and Monitoring

The most likely habitats for GGBF on site are natural and man made pits and depressions in which surface water periodically accumulates. The pits which do not have longer-term use for Site stormwater management will be in-filled by the completion of demolition (Section 3.5).

Prior to infilling (where undertaken), the pits are to be inspected by the EMR to assess for the presence of GGBF and/or tadpoles. A log recording the inspections (and results of the inspections) will be maintained by the EMR. It is the responsibility of the Demolition Contractor to make the EMR aware of the planned infilling of pits to allow adequate time (minimum of 7 days) to carry out an inspection for GGBF, and organise for relocation of identified frogs, as required.

Whilst the most likely habitats for GGBF are depressions, they may be found in other areas of the site, including amongst demolition and building debris. In addition to the planned inspections of the pits prior to infilling, any sighting of GGBF by Site staff should be reported to the EMR. The EMR will carry out a subsequent inspection, documenting the time and location of the GGBF, if present.

If GGBF or tadpoles are located in areas of the site in which demolition and infilling is occurring, or about to occur, works in this area shall cease to allow the frogs to be collected and relocated.



If GGBF or tadpoles are found in areas of the site subject to current or future demolition, the EMR is to contact DECCW on 131 555 and Garry Daly (02 4446 0384) to organise relocation of the GGBF to different (appropriate) location.

Handling of the GGBF and tadpoles will be carried out in a manner consistent with *Hygiene protocol for the control of disease in frogs (DECC, April 2008)*. A copy of this protocol will be retained on site by the EMR for reference and use, as necessary.

The stormwater pit in the north western corner of Lot 22 has been constructed to encourage habitation by the GGBF. Monthly inspection of this basin should be carried by the EMR to:

- Assess for the presence of GGBF; and
- Remove accumulated rubbish or debris.

Inspections and corrective actions (ie cleaning out rubbish and debris) should be logged by EMR. Where GGBF are identified within this storm water basin, DECCW and Garry Daly should be informed on the same day.

Contingency Plan

The following form contingent measures for the management of GGBF and possible habitats present on Site:

- DECCW and GAIA unable to be contacted or attend site: if GGBF are located in areas of the site subject to impending demolition and DECCW or GAIA are unable to attend site, the following actions are to be carried out:
 - Collect and place GGBF in a plastic box (dimensions approximately 600 x 400 x 350mm) with a clip lid. Absorbent paper towels must be wetted and placed in the box to provide adequate moisture for the animal/s and the box should be kept in a cool area out of direct sunlight.
 - Move captured animals into the stormwater detention basin in the north western corner of Lot 22.
- Maintenance of stormwater detention basin in Lot 22: the design of this basin was amended to encourage habitation of GGBF. The following form contingent actions with respect to maintenance of this feature:
 - Where plantings are found to fail, assess suitability of original vegetation and replace with like or more suitable species.
 - Where rubbish and debris to regularly collect and deposit in the basin, consider installation of coarse filter or the like.

The EMR and at least one other PKC project management staff member will be trained by in methods for safe handling and movement of GGBF.

5.2.8 Related Management Plans

In addition to the individual management plans specified in this DMP, several other documents will be prepared to address the management of the demolition works on the Site. These will comprise separate documents which will refer to this DMP and will comply with relevant guidelines. It is envisaged that these additional management plans will include the following:

- Applications to WorkCover NSW for demolition work site permit to allow demolition to proceed.
- Heritage Management Plan.
- Stack Demolition Plan, which will include the Emergency and Evacuation Management Plan.



5.3 Environmental Schedules – Performance Monitoring

This section lists relevant forms and registers to be used during the day to day environmental management of the demolition. These forms and registers will be maintained by the EMR, as detailed in Section 5.2.

The registers and forms are provided in Appendix F of this DMP, and include:

- Record Sheet - Complaints Register.
- Record Sheet - Non-Compliance Register.
- Record Sheet - WTP Rinsate Acceptance Form.
- Record Sheet – Site Induction and DMP Training Register.
- Sampling Record Sheet - Asbestos.
- Sampling Record Sheet – Dust Deposition.
- Sampling Record Sheet – HVA.
- Monitoring Record Sheet - Attended Dust Monitoring.
- Monitoring Record Sheet - Odour.
- Record Sheet – HVA Field Calibration Record.
- Record Sheet - Instrument Calibration and Maintenance Records.
- Monitoring Record Sheet - Attended Noise Monitoring.
- Monitoring Record Sheet - Vibration
- Data Download Record Sheet – Wind.
- Data Download Record Sheet - Noise.
- Inspection Record Sheet – Public Roadways and Footpaths.
- Inspection Record Sheet - Heritage Structures and Protection Measures.
- Inspection Record Sheet - Drain Blanking.
- Inspection Record Sheet - Stormwater Assets and Pavements.
- Inspection Record Sheet – Monitoring and Extraction Wells.
- Record Sheet - Corrective Action Register.
- Record Sheet – Waste Materials Tracking Form.
- Inspection Record Sheet - Green and Golden Bell Frogs.
- Record Sheet - DMP Amendments Register.

As the project progresses new registers and forms may be required to document the environmental performance on the Site.



6.0 CONTROL AND MODIFICATION OF THE DMP

Controlled copies of this DMP will be issued to the PKC project manager, the EMR and the head Demolition Contractor. Staff on-Site (including employees of PKC, the demolition contractor and other contractors) will be informed of the key environmental responsibilities required by the DMP through site induction and DMP training (refer to Section 4.4).

Changes to the DMP must be documented and signed off by the EMR. It is the responsibility of the EMR to maintain the currency of the DMP.

A register for changes to the DMP is attached in Appendix F. Changes to the DMP may be required in responses to:

- Observations made during performance auditing.
- Incidents or near misses.
- Changes in regulatory requirements.

The lists of contacts in Table 2 of this DMP are to be reviewed and confirmed regularly during the course of the project.

7.0 REFERENCES

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- GAIA Research Pty Ltd, 2010. Demolition Management Plan for the Green and Golden Bell Frog at Port Kembla Copper, Port Kembla
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- *Standards Australia, 2001. AS/NZS 4323.3: 2001 Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry.*
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- Standards Australia, 2007. AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment.
- Standards Australia, 2008. AS 4976-2008. The Removal and Disposal of Underground Petroleum Storage Tanks.
- Sue Rosen and Associates (HAAH), 14 October 2010. *Port Kembla Copper Smelter Demolition Heritage Management Plan* (Project 20/2010, Doc no. 20101006, Version B, description final).

8.0 CLOSING

Should you have any queries regarding the content of this DMP, please do not hesitate to contact the undersigned.

Regards,

GOLDER ASSOCIATES PTY LTD

Graeme Miller
Principal Scientist

JH/GM/lo

A.B.N. 64 006 107 857

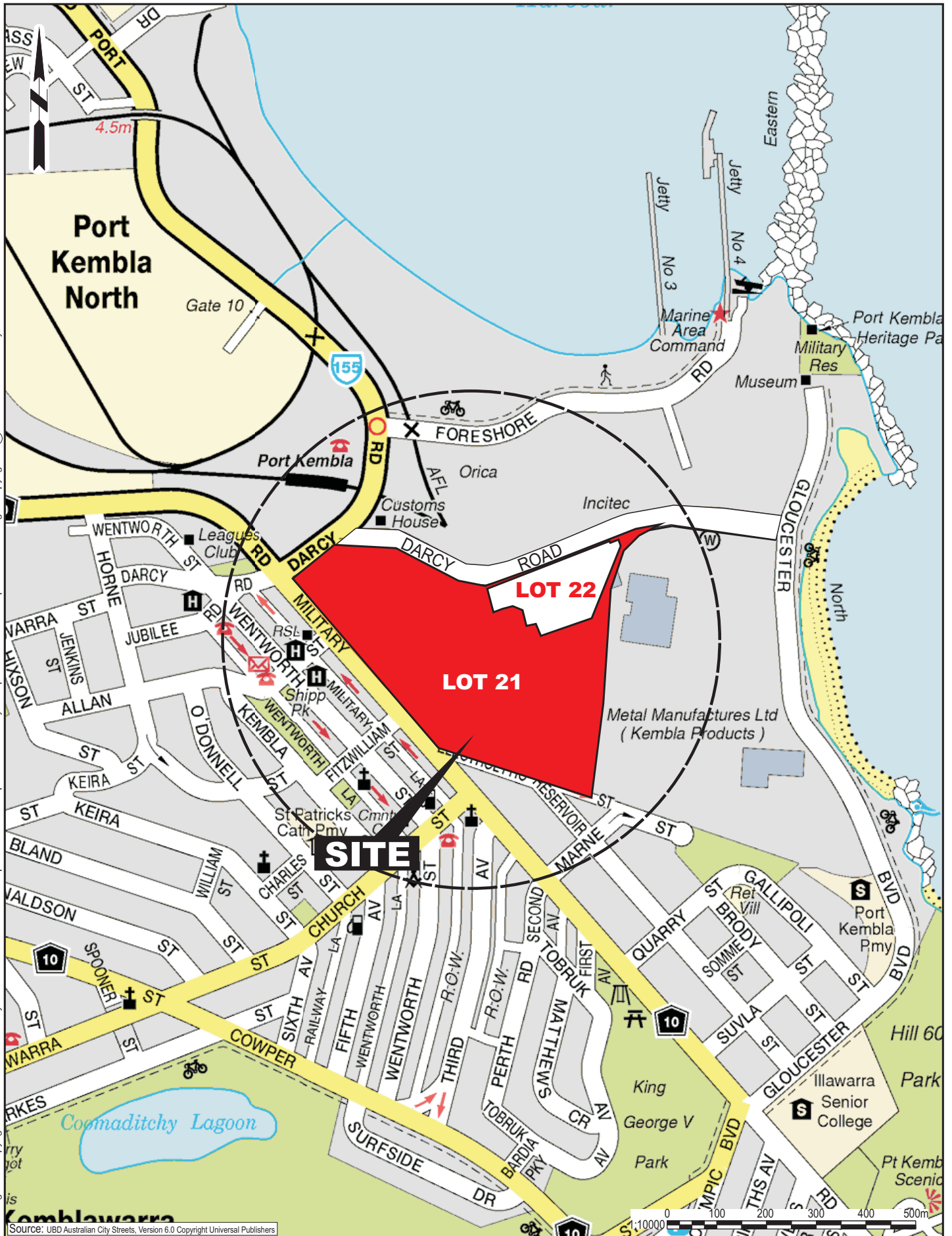
j:\env\2008\087663019 - pkc general consult advice\demo\demolition management plan\text\087663019-r-rev1.docx



FIGURE 1

Site Location Plan

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SOURCE: UBD Australian City Streets, Version 6.0 Copyright Universal Publishers

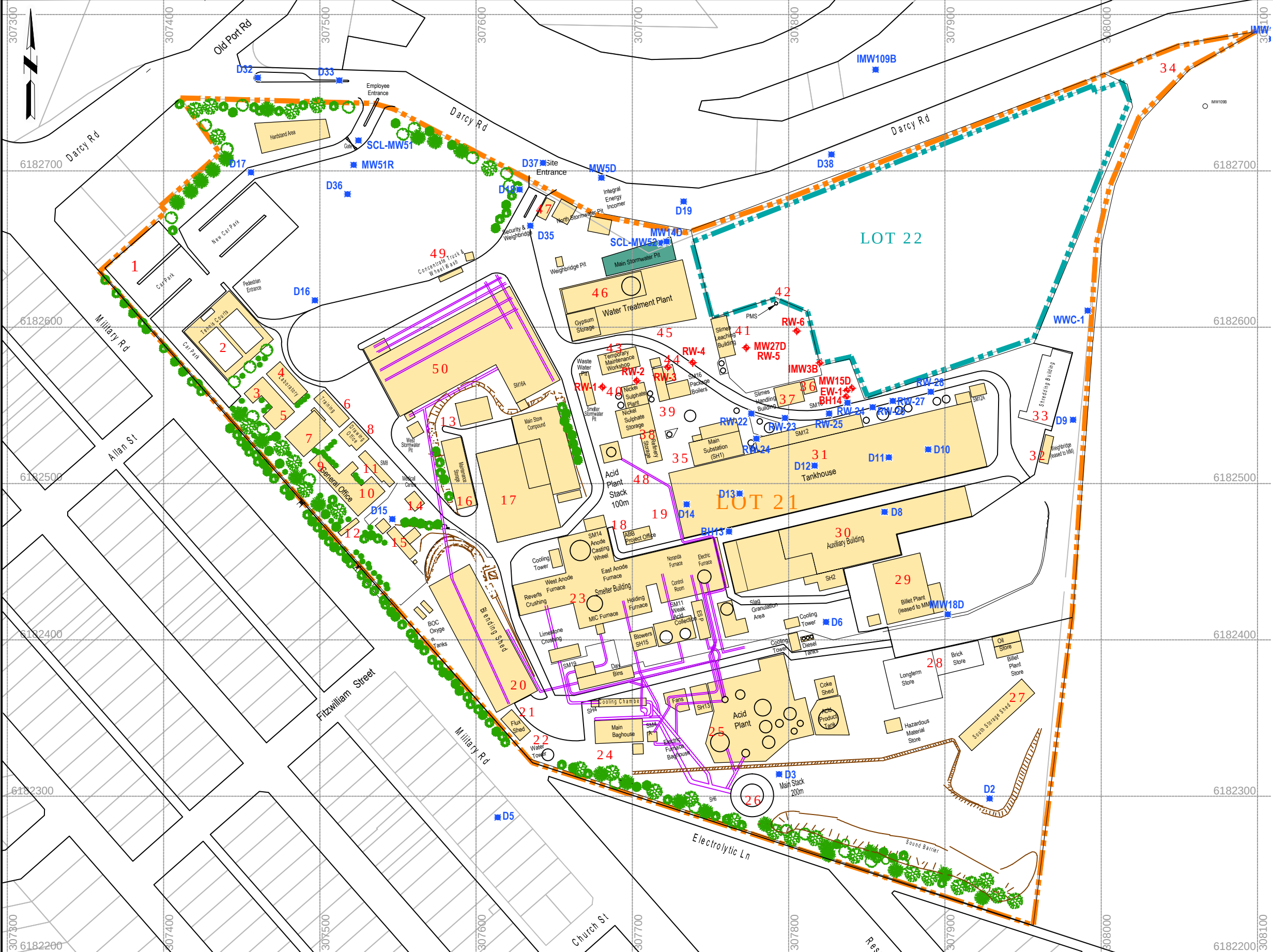
 www.golder.com GOLDER ASSOCIATES PTY LTD		CLIENT PORT KEMBLA COPPER		PROJECT DEMOLITION MANAGEMENT PLAN	
DRAWN HC		DATE 20.03.2010		TITLE SITE LOCALITY PLAN	
CHECKED GDM		DATE 20.05.2010			
SCALE 1:10,000		A4		PROJECT No 087663019	DOC No 001
				DOC TYPE R	FIGURE No F0001
				REV No 0	FIGURE 1



FIGURE 2

Site Layout Plan

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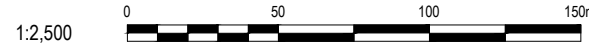


- KEY**
- 1 Carpark
 - 2 Tennis Courts
 - 3 Fire Assay
 - 4 Laboratory
 - 5 Research Building
 - 6 Training Room
 - 7 Old Assay Building
 - 8 Drawing Office
 - 9 Admin Office
 - 10 General Office
 - 11 Server Room / Env. Office
 - 12 Archive Room
 - 13 Amenity Building
 - 14 Medical Centre
 - 15 Watchman's Hut
 - 16 Engineering Store
 - 17 Engineering Workshop
 - 18 Office 'Bunker'
 - 19 Power House
 - 20 Blend Shed
 - 21 Flux Shed
 - 22 Old Stack Base
 - 23 Smelter
 - 24 Bag House
 - 25 Acid Plant
 - 26 200m Stack
 - 27 Southern Storage Shed
 - 28 Main Store
 - 29 Billet Plant
 - 30 Auxiliary Building
 - 31 Refinery
 - 32 Weighbridge & Office
 - 33 Lead Shed (Store)
 - 34 Rail Weighbridge
 - 35 Sub Station
 - 36 Switch Room
 - 37 3 Bedroom
 - 38 Storage Shed
 - 39 Compressor House
 - 40 Nickel Plant
 - 41 Selenium Building
 - 42 Precious Metals Stack
 - 43 Plumbers Shop
 - 44 Switch Room
 - 45 Painters Shop
 - 46 Water Treatment Plant
 - 47 Weighbridge & Office
 - 48 Tail Gas Scrubber
 - 49 Truck Wash
 - 50 Bulk Concentrate Store

- LEGEND**
- BUILDING
 - PIPING
 - EXISTING EXTRACTION WELL LOCATION
 - EXISTING MONITORING WELL LOCATION
 - LOT 22
 - LOT 21

SOURCE: SAMPLE LOCATIONS ARE BASED ON URS FIGURE 1, JOB REF. 4327183, FIGURE 01_20070712.WOR, 12.07.2007, TITLED "CRITICAL DEEP MONITORING WELLS" INFRASTRUCTURE AND NUMBER KEY BASED ON DRAWING PROVIDED BY PORT KEMBLA COPPER PTY LTD, DATED 10.09.1998, REF. PT-020-0147, REV C, TITLE "GENERAL PURPOSE SITE PLAN"

ADAPTED FROM DIGITAL CADASTRE DATABASE, NSW DEPARTMENT OF LANDS, 2004, ZONE 56 MGA COORDINATES





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CLIENT PORT KEMBLA COPPER			PROJECT DEMOLITION MANAGEMENT PLAN						
DRAWN BY HC		DATE 20.05.2010	DRAWING TITLE SITE LAYOUT PLAN - LOT 21 AND SURROUNDS						
CHECKED BY -		DATE 14.04.2010							
SCALE 1:2500		SHEET SIZE A3	PROJECT No 087663019	DOC No 001	DOC TYPE R	FIGURE No F0002	REVISION 0	FIGURE 2	



APPENDIX A

Order of Demolition Works

PKC Demolition Schedule

A number of issues are influencing the structure demolition schedule. A) PKC is reticent to hand the demolition of all structures to one company. B) Some structures like sheds with residual utility may be retained depending on future scenarios for the site which will only be determined later on in the year. C) The Smelter is the single most substantial and complex structure. D) the Stack will be a stand alone activity.

Assuming approval represents time zero. The overall activity is expected to take about 18 months. It is anticipated that there will be about three distinct teams of activity. This will be to control site access and avoid any conflict.

The broad approach then is to, commence with the small admin buildings and as a separate work front of the Acid Plant at month 1. Commence Smelter thereafter.

time from approval (months)	Work Group 1.	Work Group 2.	Work Group 3.	Special Activity
0				
1	Acid plant, structure # 24 & 25, about ten month duration	Smelter, structure #23	#14 + #11 + #13	main 200m Stack, #26
2			#8 + #9 + #10 + #45	
3			#12 + #15 + #22 + #43	
4			#3 + #4 + #5 + #36	
5			#18 + #19 + #34 + #38	
6			#37 + #40	
7			Refinery #31	
8				
9				
10				
11				
12	Billet plant #29			
13			#32 + #35	
14			#48	
15				
16				
17				
18				
19				
20				
21		WTP #46 + #6	#47 + #49 + #47 + #39	
22				

PKC - Structure inventory with comments

Site plan building number	Site plan building title	Comments
1	Car park	No action planned
2	Tennis Courts	Leave for the time being
3	Fire Assay	small building - demolish
4	Laboratory	small building - demolish
5	Research Bld	small building - demolish
6	Training Room	small building - demolish
7	Old Assay Office	heritage structure - preserve as admin bldg
8	Drawing Room	small building - demolish
9	Admin Office	small building - demolish
10	General office	small building - demolish
11	Server Room	small building - demolish
12	Archive Room	small building - demolish
13	Amenity Bld	small building - demolish
14	medical centre	small building - demolish
15	Watchman's hut	small building - demolish
16	Engineering story	Possible future utility, preserve for future review
17	Engineering workshop	Possible future utility, preserve for future review
18	Office (Bunker)	small building - demolish
19	Power house	unstable shell - demolish
20	Blend Shed	Possible future utility, preserve for future review
21	Flux Shed	Possible future utility, preserve for future review
22	Old Stack Base	Actually an old tank base - demolish
23	Smelter	major plant building - demolish, full length of project
24	Bag House	Small plant - demolish
25	Acid plant	large complex plant - demolish
26	200 m Stack	major structure with specific demolition plan
27	Southern Storage	Possible future utility, preserve for future review
28	Main Store	Possible future utility, preserve for future review
29	Billet plant	large complex plant - demolish
30	Auxiliary bld	Possible future utility, preserve for future review
31	Refinery	large building - demolish
32	Weighbridge+office	small building - demolish
33	lead Shed	Possible future utility, preserve for future review
34	Rail Weighbridge	small building - demolish
35	Sub Station	small building - demolish
36	Switch room	small building - demolish
37	3rd bedroom	Small plant - demolish
38	Storage She	small building - demolish
39	Compressor house	small building - demolish
40	Nickel plant	small plant demolish
41	Selenium Bld	Possible future utility, preserve for future review
42	Precious Metals Stack	heritage structure - preserve
43	Plumbers shop	small building - demolish
44	Switch Rom	small building - demolish with the WTP
45	Painters shop	small building - demolish
46	Water Treatment plant	Small plant demolish when run-off demonstrate as good quality
47	Weighbridge+Office	small building - demolish
48	tail gas Scrubber	small plant - demolish
49	Truck Wash	demolish at end of project
50	Bulk Concentrate store	Possible future utility, preserve for future review



APPENDIX B

Relevant Legislation

STATE LEGISLATION

Relevant State Legislation includes, but is not necessarily limited to:

- State Environmental Planning Policy (Major Development) 2005
- Environmental Planning and Assessment Act 1979
- Heritage Act 1977
- Threatened Species Conservation Act 1995
- Water Management Act 2000
- Protection of the Environment (Operations) Act 1997
- Protection of the Environment Operations (Waste) Regulation 2005
- Contaminated Land Management Act 1997
- Environmentally Hazardous Chemicals Act 1985
- Occupational Health and Safety Act 2000
- Occupational Health and Safety Regulation 2001
- Occupational Health and Safety Amendment (Dangerous Goods) Act 2003
- Waste Avoidance and Recovery Act 2001

AUSTRALIAN LEGISLATION, STANDARDS AND CODES OF PRACTICE

Relevant Australian Standards include, but are not necessarily limited to:

- ANZECC 1990 Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration
- AS 1940 for the Storage of Hazardous Substances
- AS 2601-2001 for the Demolition of Structures
- AS 2187.1-1998 Explosives – Storage, transport and use (Part 1: Storage)
- AS 2187.2-2006 Explosives – Storage, transport and use (use of explosives)
- AS/NZS 4323.3: 2001 Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry.
- AS 4976-2008 The Removal and Disposal of Underground Petroleum Storage Tanks.
- Commonwealth Government of Australia 1999 Environment Protection and Biodiversity Conservation Act
- DECCW 1998 Managing Urban Stormwater: Council Handbook.
- DECCW 2005 Green and Golden Bell Frog *Litoria aurea* (Lesson 1829) Recovery Plan
- DECCW May 2007 Storing and Handling Liquids: Environmental Protection
- Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment
- NOHSC, 2002 – 2005. Code of Practice for Safe Removal of Asbestos.
- Storage and Handling of Dangerous Goods Code

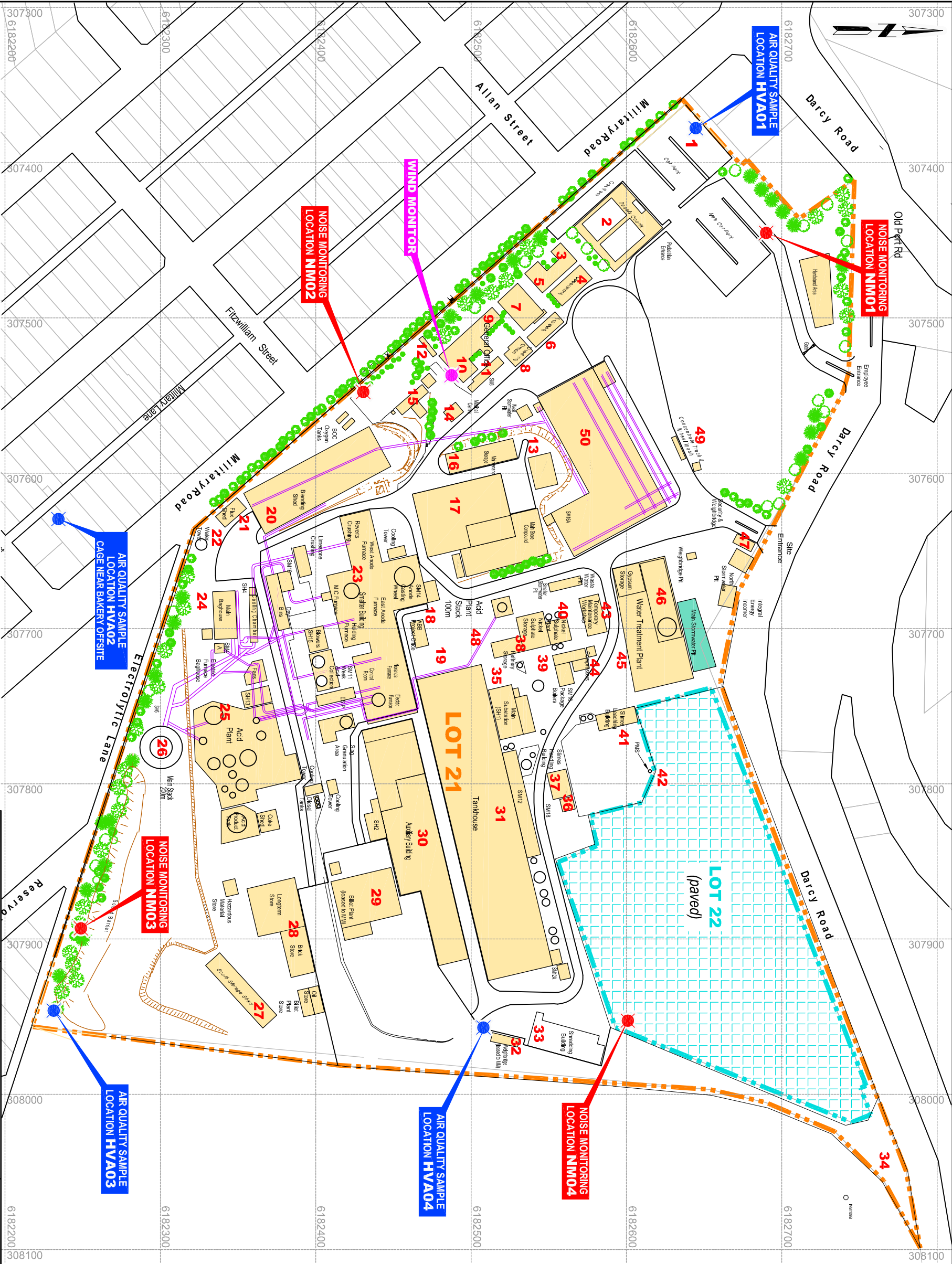


APPENDIX C

Figure Showing Locations of Air and Noise Monitors and
Weather Station

- KEY**
- 1 Campark
 - 2 Tennis Courts
 - 3 Fire Assay
 - 4 Laboratory
 - 5 Research Building
 - 6 Training Room
 - 7 Old Assay Building
 - 8 Drawing Office
 - 9 Admin Office
 - 10 General Office
 - 11 Server Room / Env. Office
 - 12 Archive Room
 - 13 Amenity Building
 - 14 Medical Centre
 - 15 Watchman's Hut
 - 16 Engineering Store
 - 17 Engineering Workshop
 - 18 Office 'Bunker'
 - 19 Power House
 - 20 Blend Shed
 - 21 Flux Shed
 - 22 Old Stack Base
 - 23 Smelter
 - 24 Bag House
 - 25 Acid Plant
 - 26 200m Stack
 - 27 Southern Storage Shed
 - 28 Main Store
 - 29 Billet Plant
 - 30 Auxiliary Building
 - 31 Refinery
 - 32 Weighbridge & Office
 - 33 Lead Shed (Store)
 - 34 Rail Weighbridge
 - 35 Sub Station
 - 36 Switch Room
 - 37 3 Bedroom
 - 38 Storage Shed
 - 39 Compressor House
 - 40 Nickel Plant
 - 41 Selenium Building
 - 42 Precious Metals Stack
 - 43 Plumbers Shop
 - 44 Switch Room
 - 45 Painters Shop
 - 46 Water Treatment Plant
 - 47 Weighbridge & Office
 - 48 Tail Gas Scrubber
 - 49 Truck Wash
 - 50 Bulk Concentrate Store

- LEGEND**
- BUILDING
 - PIPING
 - LOT 22
 - LOT 21



ADAPTED FROM DIGITAL CADASTRE DATABASE, NSW DEPARTMENT OF LANDS, 2004, ZONE 56 MGA COORDINATES

SOURCE: SITE LAYOUT BASED ON URS FIGURE 1, JOB REF. 4327183, FIGURE 01_20070712.WOR, 12.07.2007, TITLED "CRITICAL DEEP MONITORING WELLS" INFRASTRUCTURE AND NUMBER KEY BASED ON DRAWING PROVIDED BY PORT KEMBLA COPPER PTY LTD, DATED 10.09.1998, REF. PT-020-0147, REV.C, TITLE "GENERAL PURPOSE SITE PLAN"

NOTE: AIR QUALITY MONITORING LOCATIONS INCLUDE A HIGH VOLUME SAMPLER AND A DUST DEPOSITION GAUGE.

1:2,500



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CLIENT PORT KEMBLA COPPER

PROJECT DEMOLITION MANAGEMENT PLAN

DRAWN BY	HC	DATE	27.07.2010
CHECKED BY	GDM	DATE	16.09.2010

DRAWING TITLE	NOISE AND AIR QUALITY MONITORING LOCATIONS
PROJECT No.	107623114
DWG No.	001
DWG TYPE	R
FIGURE No.	F0001
REVISION	1



APPENDIX D

Air Quality Criteria

TABLE A: AIR QUALITY CRITERIA

Parameter	Guidance Document	Sample Type	Averaging Period	mg/m ³ (unless stated)	ppm
TSP	NSW DEC	TSP	1 hour	0.09	N/A
arsenic and compounds	NSW DEC	TSP	1 hour	0.00009	N/A
antimony and compounds	NSW DEC	TSP	1 hour	0.009	N/A
cadmium and cadmium compounds	NSW DEC	TSP	1 hour	0.000018	N/A
copper fumes	NSW DEC	TSP	1 hour	0.0037	N/A
copper dusts and mists	NSW DEC	TSP	1 hour	0.018	N/A
lead	NEPM	TSP	Annual	0.50	N/A
nickel and nickel compounds	NSW DEC	TSP	1 hour	0.00018	0.00009
mercury organic	NSW DEC	TSP	1 hour	0.00018	N/A
mercury inorganic	NSW DEC	TSP	1 hour	0.0018	N/A
vanadium	N/A	TSP	N/A	N/A	N/A
zinc chloride fumes	NSW DEC	TSP	1 hour	0.018	N/A
zinc oxide fumes	NSW DEC	TSP	1 hour	0.09	N/A
PM ₁₀	NEPM	PM ₁₀	1 hour	0.05	N/A
deposited dust (max)	NSW DEC	dust deposition gauge	1 month	4g/m ² /month	N/A
deposited dust (max increase)	NSW DEC	dust deposition gauge	1 month	2g/m ² /month	N/A

Notes:

NSW DEC - Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Department of Environment and Conservation, 2005).

NEPM - National Environment Protection (Ambient Air Quality) Measure (amended, 2003).

ppm - parts per million.



APPENDIX E

Photograph of Green and Golder Bell Frog





APPENDIX F

Registers and Inspection Forms

INSPECTION RECORD SHEET - GREEN AND GOLDEN BELL FROGS

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Area Inspected	Date Inspected	Person Inspecting	Location of Inspection (Pit No., Name, Site Area)	GGBF Found ? (Circle)	Comments/Actions (Include Cross Reference to Corrective Action No. and Plan No., as Required)
Pit to be Infilled				Yes/No	
Water Treatment Plant Pits				Yes/No	
Frog Pond Lot 22				Yes/No	
Other Areas (list below)					
				Yes/No	
				Yes/No	
				Yes/No	



INSPECTION RECORD SHEET- DRAIN BLANKING

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Site Building	Drain Reference No.	Date Blanking Completed	Method/Materials of Blanking	Inspection of Blanking Completed By EMR	Date of Inspection by EMR
	DR001			Yes / No	
	DR002			Yes / No	
	DR003			Yes / No	
	DR004			Yes / No	
	DR005			Yes / No	
	DR006			Yes / No	
	DR007			Yes / No	
	DR008			Yes / No	
	DR009			Yes / No	
	DR010			Yes / No	
	DR011			Yes / No	
	DR012			Yes / No	
	DR013			Yes / No	
	DR014			Yes / No	
	DR015			Yes / No	
	DR016			Yes / No	
	DR017			Yes / No	
	DR018			Yes / No	
	DR019			Yes / No	
	DR020			Yes / No	
	DR021			Yes / No	

INSPECTION RECORD SHEET - PUBLIC ROADWAYS AND FOOTPATHS

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Roads and Footpaths Inspected	Date Inspected	Person Inspecting	Damaged Asset or Material on Road	Comments/Actions (Include Cross Reference to Corrective Action No. and Plan No., as Required)
			(Circle)	
Darcy Road			Yes / No	
Military Road			Yes / No	
Old Port Road			Yes / No	
Other			Yes / No	



INSPECTION RECORD SHEET - STORMWATER ASSETS AND PAVEMENTS

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]



INSPECTION RECORD SHEET - HERITAGE STRUCTURES AND PROTECTIVE MEASURES

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]



INSPECTION RECORD SHEET - MONITORING AND EXTRACTION WELLS

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

**MONITORING RECORD SHEET - ATTENDED NOISE MONITORING**

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

*Refer to site plan, as required.

**MONITORING RECORD SHEET - ATTENDED DUST MONITORING**

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

*Refer to site plan, as required.



DATA DOWNLOAD RECORD SHEET - WIND

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

MONITORING RECORD SHEET - VIBRATION

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Monitoring Location	Date of Monitoring	Monitoring Interval	Person Downloading Data	Comments/Actions (Cross Reference to Corrective Action No. and Plan No., as Required)
VM01				
VM02				
VM03				

RECORD SHEET - WTP RINSATE ACCEPTANCE FORM

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Source of Wastewater	Date Assessed	Volume of Water (L)	Contaminants (provide analytical report cross reference)	Accept Water to WTP (circle)	Assessing/Approving Person*	Cross Reference to Waste Tracking Form (for Water Disposed Off Site)
				Yes/No		
				Yes/No		
				Yes/No		
				Yes/No		
				Yes/No		
				Yes/No		
				Yes/No		

*Assessing/approving persons - Tony Rooskie, Ian Wilson, EMR.

RECORD SHEET - WASTE MATERIALS TRACKING FORM
Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Source	Stockpile/Liquid Waste Reference No.	Date Assessed	Waste Type (circle)	Volume (Litres or m ³)	Material Classification*	Material Assessment Report Ref. No.**	Material Fate (circle)	Location of Disposed or Reused Material (Waste Facility or Site Location)***	Cross Reference to Waste Acceptance Sheets (for Material Disposed Off Site)
			Solid / Liquid			MR001	Dispose off site/ Reuse on site		
			Solid / Liquid			MR002	Dispose off site/ Reuse on site		
			Solid / Liquid			MR003	Dispose off site/ Reuse on site		
			Solid / Liquid			MR004	Dispose off site/ Reuse on site		
			Solid / Liquid			MR005	Dispose off site/ Reuse on site		
			Solid / Liquid			MR006	Dispose off site/ Reuse on site		
			Solid / Liquid			MR007	Dispose off site/ Reuse on site		
			Solid / Liquid			MR008	Dispose off site/ Reuse on site		
			Solid / Liquid			MR009	Dispose off site/ Reuse on site		
			Solid / Liquid			MR010	Dispose off site/ Reuse on site		
			Solid / Liquid			MR011	Dispose off site/ Reuse on site		
			Solid / Liquid			MR012	Dispose off site/ Reuse on site		
			Solid / Liquid			MR013	Dispose off site/ Reuse on site		
			Solid / Liquid			MR014	Dispose off site/ Reuse on site		

Notes:

*To be carried out and approved by EMR

**A memo should be prepared detailing the waste material sampling results and assessment of results against criteria. Reports should be given unique numbers for cataloguing and tracking.

***Refer to map showing location of material placed on site.

RECORD SHEET - COMPLAINTS REGISTER

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Nature of Complaint	Date Complaint Registered	Complaint Ref No.	Person Making Complaint and Contact Details	Person Recording Complaint	Date for Reponse	Date Complaint Closed*	Comments/Actions (Include Cross Reference to Corrective Action No., as Required)
		C001					
		C002					
		C003					
		C004					
		C005					
		C006					
		C007					
		C008					
		C009					
		C010					
		C011					
		C012					
		C013					
		C014					
		C015					
		C016					
		C017					

Notes:

* Complaint can only be closed by EMR.

RECORD SHEET - NON-COMPLIANCE REGISTER

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

Nature of Non-Compliance	Date of Non-Compliance	Non-Compliance Ref No.	Date for Notifying DoP	Date for Reporting to DoP	Date Non-Compliance Closed*	Comments/Actions (Include Cross Reference to Corrective Action No., as Required)
		NC001				
		NC002				
		NC003				
		NC004				
		NC005				
		NC006				
		NC007				
		NC008				
		NC009				
		NC010				
		NC011				
		NC012				
		NC013				
		NC014				
		NC015				
		NC016				
		NC017				

Notes:

* Non-compliance can only be closed by EMR.



RECORD SHEET - CORRECTIVE ACTION REGISTER

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]



RECORD SHEET - SITE INDUCTION AND DMP TRAINING REGISTER

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

*Highlight cells when refresher training completed.



RECORD SHEET - INSTRUMENT CALIBRATION AND MAINTENANCE RECORDS

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

Highlight cells when refresher training completed.



RECORD SHEET - DMP AMENDMENTS REGISTER

Port Kembla Copper Demolition Project, Military Road, Port Kembla.

[illegible]

Notes:

*Changes to DMP to be communicated and released by EMR.

Client: Port Kembla Copper		Project No: 107623114
Project: PKC Demolition		Conducted By:
Location:		
Sampling Record Sheet - Asbestos		
Date:	Time started:	Time stopped:
Weather conditions:		
Wind direction & strength:		
Sample pump type:	Sample pump SN:	
Dry calibrator type:	Dry calibrator SN:	
Filter/sample id:		
Initial flow rate (L/min):		
Initial sample period (min):		
Final Flow rate (L/min):		
Final sample period (min):		
Total Volume sampled (L):		
Observations, Comments and Actions. Include Works Being Carried Near Monitoring Location, Cross Reference to Corrective Action No. and Plan No., as Required.		

Client: Port Kembla Copper
 Project: PKC Demolition
 Location: Military Rd Port Kembla

Project No: 107623114
 Conducted By:

Sampling Record Sheet - Dust Deposition

Sample Location: Diameter of funnel:

Date/Time Placed: Condition of DDG:

Date/Time Collected:

Activities in area not associated with Demolition:

Sample Location:

Date/Time Placed:

Date/Time Collected:

Activities in area not associated with Demolition:

Sample Location:

Date/Time Placed:

Date/Time Collected:

Activities in area not associated with Demolition:

Sample Location:

Date/Time Placed:

Date/Time Collected:

Activities in area not associated with Demolition:

Observations, Comments and Actions. Include Works Being Carried Near
 Monitoring Location, Cross Reference to Corrective Action No. and Plan
 No., as Required.

Client: Port Kembla Copper		Project No: 107623114	
Project: PKC Demolition		Conducted By:	
Location: Military Rd Port Kembla			
Record Sheet – HVA Field Calibration Record			
Sample Location:		Temperature (°C):	
Date/time:		Pressure (Hpa):	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Sample Location:		Temperature (°C):	
Date/time:		Pressure (Hpa):	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Sample Location:		Temperature (°C):	
Date/time:		Pressure (Hpa):	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Sample Location:		Temperature (°C):	
Date/time:		Pressure (Hpa):	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	
Flow (m³/h):		Required ΔH (mmH₂O):	
Observed ΔH (mmH₂O):		Calibration OK:	


TABLE 5: HVS FIELD DATA SHEET

PROJECT NO.		CHECKED BY:	
EQUIPMENT SERIAL NO.		DATE:	
ANALYTE	TSP/PM10/PM2.5		
LOCATION			

SITE VISIT DETAILS:					
Installation Date					
Time (hours)					
Signature					
Impactor plate cleaned/greased?	Yes / No / NA	Yes / No / NA	Yes / No / NA	Yes / No / NA	Yes / No / NA
Collection Date					
Time (hours)					
Signature					

FILTER DETAILS:					
Filter No.					
Sample No.					

SAMPLE DETAILS:					
Start date					
Start time (hours)					
Start MFC flowrate (m ³ /hour)					
Start run time meter (min/hours)					
Start total volume (m ³)					
Start corrected volume (Nm ³)					
Operating Mode	Timer / manual	Timer / manual	Timer / manual	Timer / manual	Timer / manual
Finish date					
Finish time (hours)					
Finish MFC flowrate (m ³ /hour)					
Finish run time meter (min/hours)					
Finish total volume (m ³)					
Finish corrected volume (Nm ³)					
Circuit breaker (power on/off)					
Timer reset/next run day					

SINGLE POINT CALIBRATION CHECK:					
Flow (m ³ /hour)					
Temperature (°C)					
Pressure (kPa/mmHg)					
ΔH (mmH ₂ O)					

COMMENTS:	

Client: Port Kembla Copper		Project No: 107623114	
Project: PKC Demolition		Conducted by:	
Location:			
Monitoring Record Sheet - Odour			
Date:			
Weather conditions:			
Wind direction, strength:			
Odour Detections			
HVA01	Yes / No	Odour strength:	
Time conducted:		Odour Character:	
HVA02	Yes / No	Odour strength:	
Time conducted:		Odour Character:	
HVA03	Yes / No	Odour strength:	
Time conducted:		Odour Character:	
HVA04	Yes / No	Odour strength:	
Time conducted:		Odour Character:	
Observations, Comments and Actions. Include Works Being Carried Near Monitoring Location, Cross Reference to Corrective Action No. and Plan No., as Required.			
Odour strength and characteristics (Record Above is 'Yes' odour is detected)			
How strong is the Odour (1-5)?			
Very Faint	1	Faint	2
Strong	4	Very Strong	5
		Moderate, Easily Noticeable	3
What does the odour smell like from your experience?			
A Bitter	B Salty	C Sweet	D Sour
E Oily	F Diesel Engine	G Tarry	H Sulphur
I Animal Musky	J Skunky	K Stale	L Other
M Chemical	N Sharp	O Ammonia	P Chlorine
Q Soapy	R Plastic/Vinyl	S Metallic	T Solvent
U Pesticide	V Smokey	W Manure	X Fertilizer
Where do you think the odour is coming from?:			
Observations:			

Client: Port Kembla Copper		Project No: 107623114	
Project: PKC Demolition		Conducted By:	
Location:			
Data Download Record Sheet - Noise			
Date/Time Started:			
Date/Time Stopped:			
Is date and time correct in noise logger (Y/N):			
Calibration check:		94dB:	
Calibrator SN:		114dB:	
Noise logger type:		Noise logger SN:	
Card No:		Battery charged (Y/N):	
Is card installed:		Battery due for replacement:	
Measurement time (15min):			
Store mode (Auto 2 Leq):			
Calibration mode (external):			
File name:			
Parameters recorded (On/OFF): Leq: L05: LE: L10: Lmax: L50: Lmin: L90: LCpk: L95: LIST: TL:			
Calibration check after recording:		94dB:	
Calibrator SN:		114dB:	
Date/Time Data Downloaded:		Location Data stored:	
Observations, Comments and Actions. Include Works Being Carried Near Monitoring Location over monitoring period, Cross Reference to Corrective Action No. and Plan No., as Required.			



APPENDIX G

Limitations (LEG04 RL1)

LIMITATIONS

This Document has been provided by Golder Associates Pty Ltd ("Golder") subject to the following limitations:

This Document has been prepared for the particular purpose outlined in Golder's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.

The scope and the period of Golder's Services are as described in Golder's proposal, and are subject to restrictions and limitations. Golder did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Golder in regards to it.

Conditions may exist which were not detected given the limited nature of the enquiry Golder was retained to undertake with respect to the site. Variations in conditions may occur between assessment locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.

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Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Golder for incomplete or inaccurate data supplied by others.

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At Golder Associates we strive to be the most respected global group of companies specialising in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organisational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Pty Ltd
199 Franklin Street
Adelaide, South Australia 5000
Australia
T: +61 8 8213 2100





APPENDIX B

Relevant Legislation and Codes

STATE LEGISLATION

Relevant State Legislation includes, but is not necessarily limited to:

- State Environmental Planning Policy (Major Development) 2005
- Environmental Planning and Assessment Act 1979
- Heritage Act 1977
- Threatened Species Conservation Act 1995
- Water Management Act 2000
- Protection of the Environment (Operations) Act 1997
- Protection of the Environment Operations (Waste) Regulation 2005
- Contaminated Land Management Act 1997
- Environmentally Hazardous Chemicals Act 1985
- Occupational Health and Safety Act 2000
- Water Management Act 2000
- Waste Avoidance and Recovery Act 2001
- Work, Health and Safety Regulation 2011

AUSTRALIAN LEGISLATION, STANDARDS AND CODES OF PRACTICE

Relevant Australian Standards include, but are not necessarily limited to:

- ANZECC 1990 Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration
- AS 1940 for the Storage of Hazardous Substances
- AS 2601-2001 for the Demolition of Structures
- AS 2187.1-1998 Explosives – Storage, transport and use (Part 1: Storage)
- AS 2187.2-2006 Explosives – Storage, transport and use (use of explosives)
- AS/NZS 4323.3: 2001 Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry.
- AS 4976-2008 The Removal and Disposal of Underground Petroleum Storage Tanks.
- Commonwealth Government of Australia 1999 Environment Protection and Biodiversity Conservation Act
- DECCW 1998 Managing Urban Stormwater: Council Handbook.
- DECCW May 2007 Storing and Handling Liquids: Environmental Protection
- Methods for sampling and analysis of ambient air Part 1.1: Guide to siting air monitoring equipment
- NOHSC, 2002 – 2005. Code of Practice for Safe Removal of Asbestos.
- EPA, January 2000. NSW Industrial Noise Policy.
- Storage and Handling of Dangerous Goods Code



APPENDIX C

Record of Agency Consultation

Summary of key agency consultations

Agency	Date consulted	Summary of discourse
NSW Department of Planning and Infrastructure	19 July 2013	Approval of consultants for management plans sought
	8 August 2013	Meeting to update Department on progress towards stack demolition
	19 August 2013	Meeting to update Department on progress towards stack demolition
	10 September 2013	Meeting to update Department on progress towards stack demolition
	16 January 2014	Meeting on status of actions and planning
	30 January 2014	Meeting on status of actions and planning
	6 February 2014	Discussion on dust clean up protocol for stack demolition
	12 February 2014	Dust suppression trial and updates to stack demolition management plan
NSW Environment Protection Authority	21 February 2013	EPA represented at Community Liaison Group meeting
	21 March 2013	EPA represented at Community Liaison Group meeting
	18 April 2013	EPA represented at Community Liaison Group meeting
	16 May 2013	EPA represented at Community Liaison Group meeting
	20 June 2013	EPA represented at Community Liaison Group meeting
	14, 16 and 20 August 2013	Drafts of Demolition Management Plan provided for feedback
	6 February 2014	Discussion on dust clean up protocol for stack demolition
	12 February 2014	Dust suppression trial and updates to stack demolition management plan
Wollongong City	21 February	Council represented at Community Liaison Group meeting

Council	2013	
	21 March 2013	Council represented at Community Liaison Group meeting
	18 April 2013	Council represented at Community Liaison Group meeting
	16 May 2013	Council represented at Community Liaison Group meeting
	20 June 2013	Council represented at Community Liaison Group meeting
	18 July 2013	Council represented at Community Liaison Group meeting
	26 August 2013	Presentation made to Council at the Public Access Forum to update on status of project and answer questions from Councillors
	6 February 2014	Discussion on dust clean up protocol for stack demolition
	12 February 2014	Dust suppression trial and updates to stack demolition management plan
WorkCover	15 February 2010	Meeting chaired by WorkCover to discuss the draft Exclusion Zone
	30 July 2013	Meeting regarding Exclusion Zone and Demolition Management Plan (now called <i>Stack Demolition Process and Techniques Plan</i> by Precision Demolition). Acceptance of <i>Notice of intention to commence demolition</i> issued.
	11 September 2013	Verbal acceptance of broader 300m+ Exclusion Zone
	6 February 2014	Discussion on dust clean up protocol for stack demolition
	12 February 2014	Dust suppression trial and updates to stack demolition management plan
Illawarra Emergency Management Committee*	13 August 2013	Meeting to confirm arrangements for evacuation and seek input from participating agencies
	27 August 2013	Participants advised that the planned demolition date would change (5 September). Some agencies left, then requirements of management plans were discussed
NSW Department of Health	6 February 2014	Discussion on dust clean up protocol for stack demolition
	12 February	Dust suppression trial and updates to stack demolition

	2014	management plan
--	------	-----------------

* Including NSW Police, Wollongong City Council, Ambulance Service, Fire and Rescue, State Emergency Service, Volunteer Rescue Association, Meetings on 13 and 27 August also included WorkCover and Department of Planning and Infrastructure



APPENDIX D

Internal Photographs of Stack and Stack Bricks



Exposed face of internal stack brick from level 1



Exposed face of internal stack brick from level 6

Project No: 87663019
Client: Port Kembla Copper Pty Ltd
Project: SDMP
Location: Port Kembla, NSW

Photos





Exposed face of internal stack brick from level 15



Exposed face of internal stack brick from level 18

Project No: 87663019
Client: Port Kembla Copper Pty Ltd
Project: SDMP
Location: Port Kembla, NSW

Photos





Exposed face of internal stack brick from level 21



Internal section of stack showing clean bricks

Project No: 87663019
Client: Port Kembla Copper Pty Ltd
Project: SDMP
Location: Port Kembla, NSW

Photos





Internal section of stack showing clean bricks and temporary props

Project No: 87663019
Client: Port Kembla Copper Pty Ltd
Project: SDMP
Location: Port Kembla, NSW

Photos





APPENDIX E

Metals and Asbestos Analysis and Asbestos Removal Certificate

16/09/2013

File Reference: 2116-01-LT

Ian Wilson
Port Kembla Copper
Military Road
Port Kembla NSW 2505

Re: Port Kembla Copper Stack Removal, Military Rd, Port Kembla NSW 2505

Dear Ian,

Clearsafe Environmental Solutions Pty Ltd (Clearsafe) is pleased to provide our consulting and laboratory services to Port Kembla Copper (PKC) with regard to Port Kembla Copper Stack Removal, Military Rd, Port Kembla NSW 2505.

The Main Stack consists of a brick inner chimney, a concrete support structure and a concrete wind shield. Gaskets were located between the brick levels near the interface with the supporting concrete shell (refer to Drawing – Appendix 1).

PKC identified that the gaskets may contain asbestos and as part of the demolition due diligence, the gaskets were tested by a NATA accredited laboratory (refer to Clearsafe Environmental Solutions report, Appendix 2).

The gaskets have subsequently been removed by Precision Demolition and a Clearance Certificate (refer to Appendix 3) has been issued by a Class A Asbestos Assessor (Ryan Heckenberg, Licence Number LAA000121).

The bricks and concrete components of the Stack have subsequently been sampled by Precision Demolition and analysed by Airsafe. No Asbestos was detected by the NATA accredited analysis of these components.

It is my professional opinion that as far as reasonably practicable all appropriate measures have been undertaken to ensure that identifiable asbestos-containing materials do not remain within the Stack.

For any queries or further information please contact the Clearsafe team on 1300 042 962 or info@clearsafe.com.au.

Kind Regards,



Ryan Heckenberg
Occupational Hygienist
Class A Asbestos Assessor

Encl. Appendices 1 – 5



ISO 9001:2008 Certified

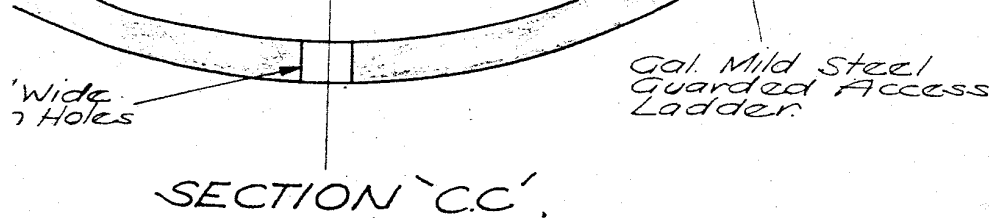
Clearsafe Environmental Solutions Pty Ltd ABN: 31 146 947 766
NATA Accredited Laboratory Number 18542
16 Stewart St, Wollongong NSW 2500
PO Box 337, Unanderra NSW 2526
Tel. 1300 042 962 Fax. 02 4228 6275

Website: www.clearsafe.com.au Email: info@clearsafe.com.au



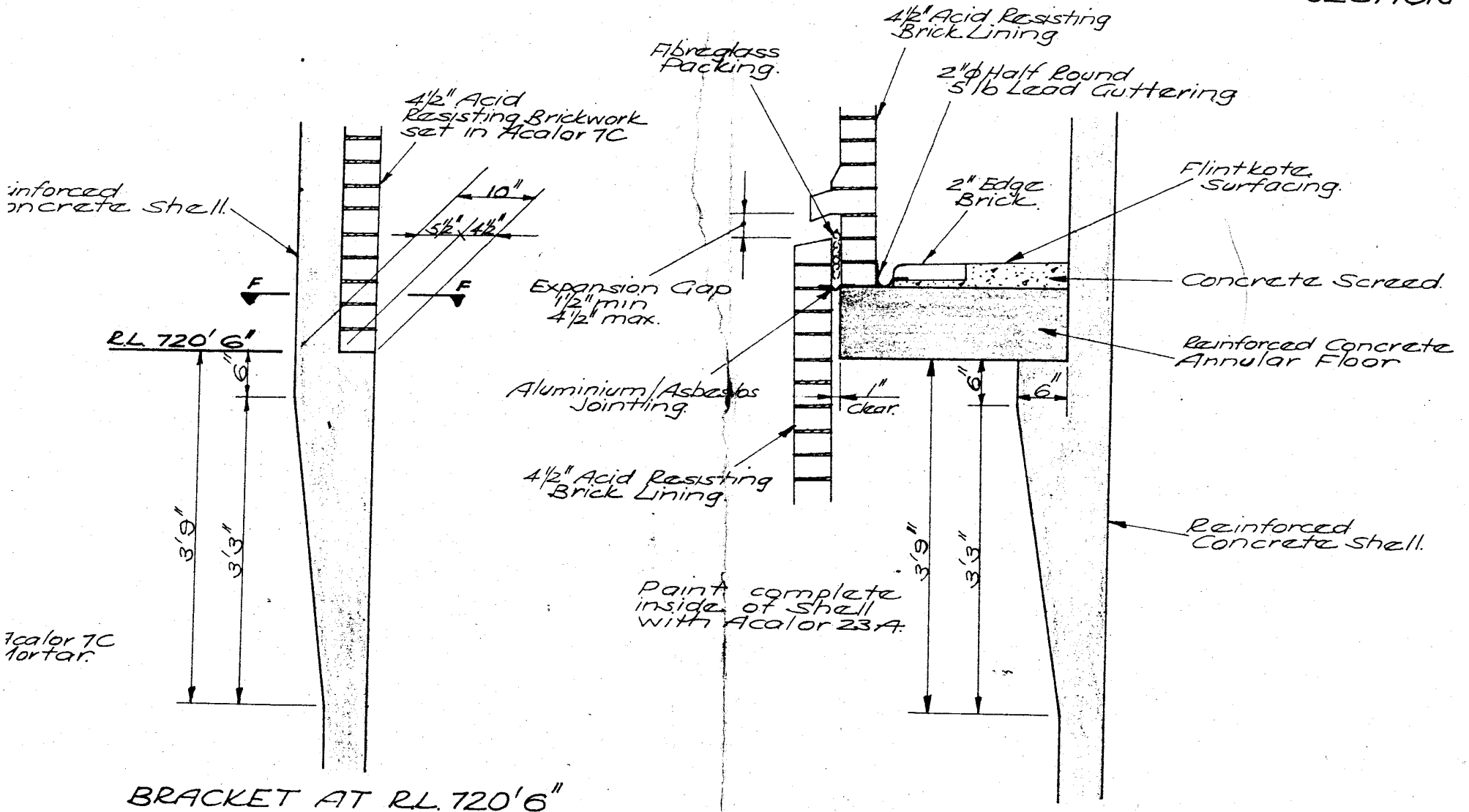
Appendix 1

Brick Chimney Joint Construction Diagram



Reinforced
Concrete Shell.

SECTION 'B.E'



inforced
oncrete shell.

RL 720' 6"

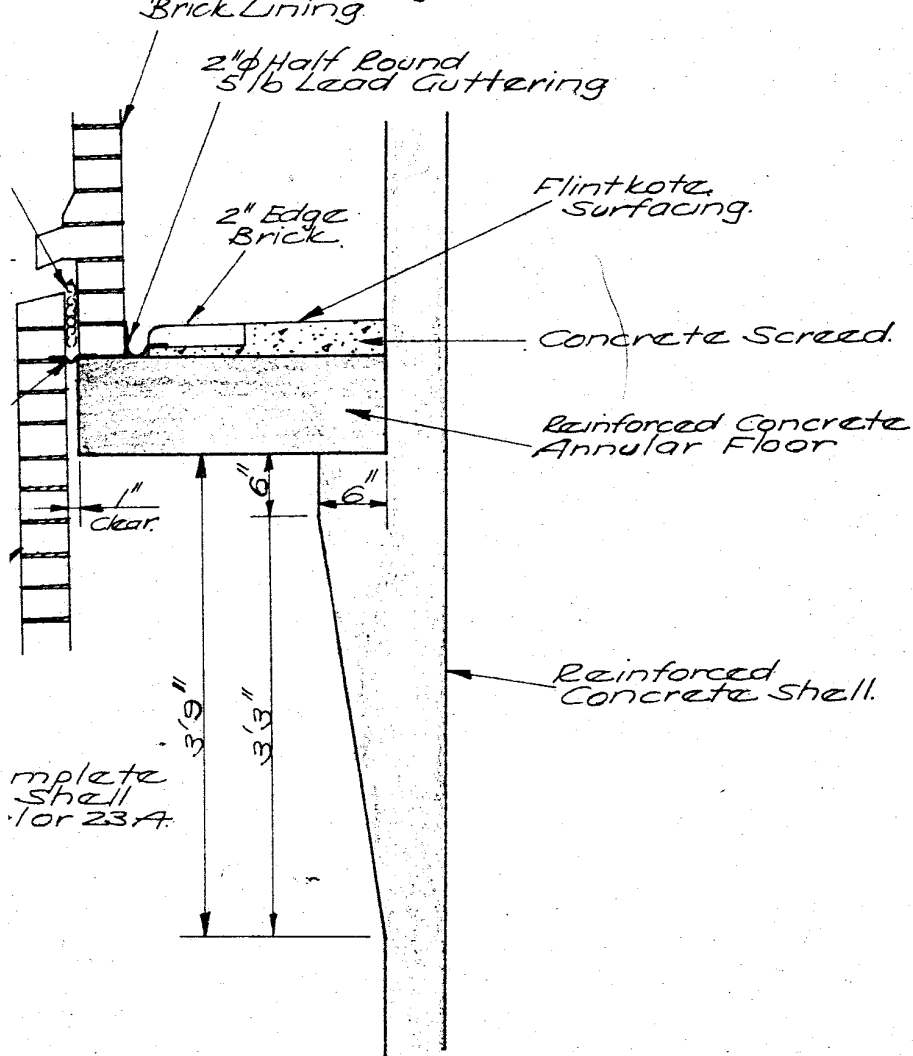
Acalor TC
10ftar.

4 1/2" Acid Resisting
Brickwork

FOR APPROVAL

DRAWN BY	K. HARVEY	11. 9. 64.
TRACED BY		

THIS DESIGN REMAINS THE PROPERTY OF
AND MUST NOT BE LENT OR COPIED WITHOUT PERMISSION OF



BRACKET DETAIL.

FOR APPROVAL

THIS DESIGN REMAINS THE PROPERTY OF
AND MUST NOT BE LENT OR COPIED WITHOUT PERMISSION OF

TILEMAN & CO.

AUSTRALIA PTY. LTD.

52 RICKETTS RD., MT WAVERLEY. VIC.

ORIGINAL

DATE 9 OCT 1964

PT-325-5129

SHOWS THE LOCATION OF THIS UNIT

18183
15225
18181

SMELTERS

FUME TREATMENT.

650' SMELTERS STACK.
OUTER SHELL RL 473' - 735'
DETAILS & SECTIONS

ELECTROLYTIC REFINING & SMELTING COMPANY OF AUSTRALIA PTY. LTD.

13-11-64	15226
16-11-64	
13/1/64	
DATE	SCALE

ARRANGEMENT OF OUTER
SHELL - RL 473' to RL 735'
FOR 667' R.C. CHIMNEY.
Electrolytic Refining & Smelting
Company of Australia Pty. Ltd.
Port Kembla. N. S. W.

C1031

DRAWING No.

756 2 of 2

Appendix 2

Analysis Report (Gaskets) - Clearsafe Environmental Solutions

Certificate of Analysis



304 Cordeaux Road, Mt Kembla NSW 2526
Tel. 02 4272 7114 Fax. 02 4272 8119
www.clearsafe.com.au

Report: 1007-05-ID

Job Number: 1007

URI Number: ID151982345

Date of Analysis: 18/05/2011

Date of Report: 18/05/2011

Client: Port Kembla Copper

Client Address: Military Road Port Kembla NSW 2505

Sampled By: As Received

Date Received: 17/05/2011

Client Contact: Ian Wilson

Site address: Military Road, Port Kembla NSW 2505

Test Method: Asbestos identification in bulk samples by polarised light microscopy and Dispersion Staining, in accordance with AS 4964-2004 Method for the Qualitative Identification of Asbestos in Bulk Samples and Clearsafe Method SOP.ID.01.

Notes:

- The results contained within this report relate only to the samples tested.
- This report should not be copied, presented or reviewed except in full.
- Detection Limit - 0.1g/kg (AS 4964)
- An independent analytical technique is recommended for the confirmation of vinyl and bituminous sample results

Sample No.	Sample Location	Sample Description	Analytical Result
1007 / 26	Main Stack Level 10	Fibrous Matt (150x500x5mm)	Ch
1007 / 27	Main Stack level 10 Mortar on Top of Seal	Dark Grey Mortar with Adhering Fibrous Matting (200x150x20mm)	Ch
1007 / 28	Main Stack Level 14	Brown Fibrous Matt (80x80x40mm)	Ch
1007 / 29	Main Stack Level 14	Light Brown Fibrous Matt with Refractory (150x100x50mm)	Ch
1007 / 30	Main Stack Level 15	Synthetic Material with Silky White Fibrous Contamination (200x150x20mm)	Ch SMF
1007 / 31	Main Stack Level 18	Off White Fibrous Mass with Refractory Products (150x100x5mm)	Ch

Analysed By:



Ryan Heckenberg

Approved By:



Ryan Heckenberg

Report Key:

NAD: No Asbestos Detected

Ch: Chrysotile Asbestos Detected

Am: Amosite Asbestos Detected

Cr: Crocidolite Asbestos Detected

Org: Organic Fibre

SMF: Synthetic Mineral Fibre

UMF: Unknown Mineral Fibre

FCS: Fibrous Cement Sheeting

VFT: Vinyl Floor Tile

Appendix 3

Clearance Certificate – Clearsafe Environmental Solutions

Asbestos Visual Clearance Certificate



Report No.: 1925-01-CL
Date of Report: 27 August 2013
Date of Inspection: 20 August 2013
Client: Precision Demolition
Client Address: PO Box 3178, Asquith NSW 2077
Client Contact: Sean Miller
Removal Contractor: Precision Demolition
Site Address: Port Kembla Copper Main Stack, Military Road, Port Kembla NSW 2505
Scope of Work:

- Removal of woven fibrous expansion joints from the inner-chimney interface between brickwork and supporting condrells, Levels 1 to 21 inclusive (refer to Figure 1).
- Removal of NW facing and SE facing ductwork packing sheets.

Area(s) Inspected:

- Upper horizontal surfaces of condrells, Levels 1 to 21 inclusive (refer to Figure 1).
- Mating surfaces of NW facing and SE facing ductwork flanges.

Inspection Details:

It is the opinion of the Consultant that the current scope of work has been completed to a satisfactory industry standard, and that the above mentioned area(s) inspected are considered safe for further work to continue.

Airborne fibre monitoring using the membrane filter method was undertaken during the removal works. The results of the monitoring were less than the minimum detection limit of the method, which is <0.01f/mL (refer to Clearsafe reports 1925-01-AM to 1925-27-AM).

Notes and Limitations:

The scope of the current commission was limited to the area inspected. Therefore this report does not constitute a thorough site survey for Asbestos. Unless specifically noted, this report expressly excludes any Asbestos contamination within soil, on or beneath the ground surface.

All work is conducted in a conscientious and professional manner, with due diligence and appropriate care. However due to the disproportionate cost of potential damages or liability relative to the cost of our services, Clearsafe cannot offer any guarantee that all hazards have been identified. Subsequently, Clearsafe's liability to the client or any other party resulting from the performance or non-performance of the service, whether under contract law, tort law or otherwise, is limited to a maximum of up to five (5) times the total fee excluding expenses.

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Ryan Heckenberg
Occupational Hygienist
Class A Asbestos Assessor (Lic. LAA000121)

Encl.:
Figure 1: Schematic indicative location of area inspected



ISO 9001:2008 Certified

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NATA Accredited Laboratory Number 18542
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PO Box 337, Unanderra NSW 2526
Tel. 1300 042 962 Fax. 02 4228 6275
Website: www.clearsafe.com.au Email: info@clearsafe.com.au



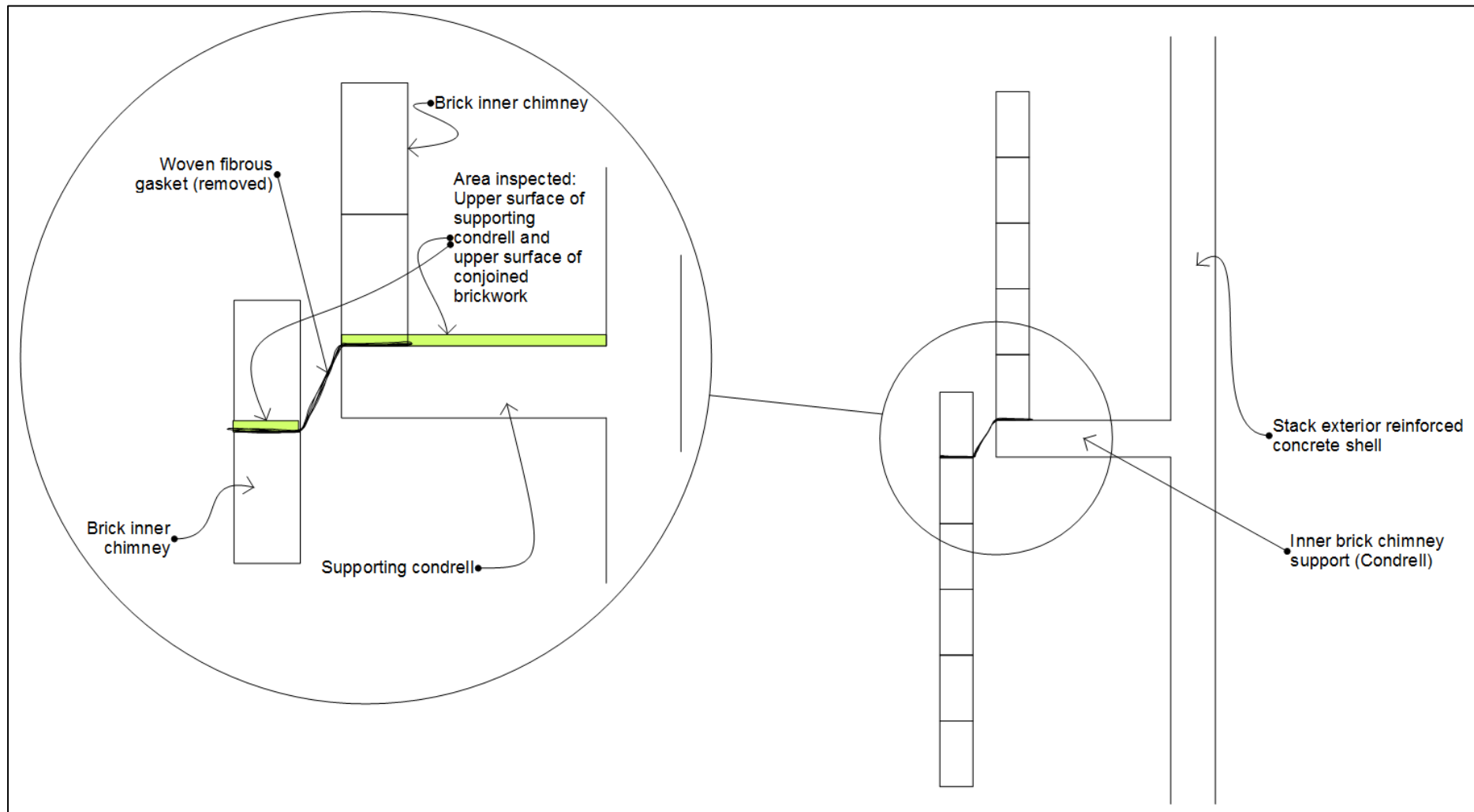


Figure 1: Schematic indicative location of area inspected, Levels 1 to 21 (NOT TO SCALE)

Appendix 4

Analysis Report (Brick) - Airsafe

TEST REPORT

August 22, 2013

Precision Demolition

PO Box 3178
ASQUITH NSW 2077

Your Reference: Port Kembla Copper Stack
Job Number: 20437

Attention: Sean Miller

Dear Sean,

In accordance with your instructions, Airsafe tested samples from the above site for asbestos content.

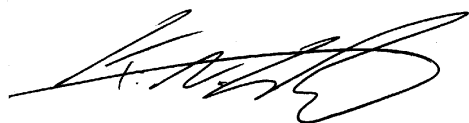
The following samples were processed on the dates indicated.

Samples:	2 Samples
Date of Sample Receipt:	22/08/13
Date of Sample Analysis:	22/08/13
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

A handwritten signature in black ink, appearing to read "K. White", written in a cursive, flowing style.

Kieran White
Approved Identifier and Signatory

PROJECT: Port Kembla Copper Stack**JOB NO: 20437**

Sample No	Location/Reference	Sample Description	Asbestos ID - Material
20437-1	Sample Brick 1 – Level 3	57g debris	No asbestos detected
20437-2	Sample Brick 2 – Level 8	64g debris	No asbestos detected

Method: Samples have been analysed using polarised light microscopy including dispersion staining in accordance with the Method for the qualitative identification of asbestos in bulk samples [AS 4964 – 2004] and in-house method AS102 - Method for the Qualitative Identification of Asbestos in Bulk Samples.

Sampling: Samples have been analysed on an “as received” basis. All sampling conducted by the customer. All data supplied by the customer.

Note: The results relate only to the samples tested.

Comment: Even after disintegration of certain bulk samples (vinyl tiles and bituminous type materials), the detection of fibres may be difficult when using Polarised Light Microscopy and Dispersion Staining Techniques. This may be due to the matrix of the sample (uneven distribution), or fine fibres that are difficult to detect and positively identify.

Appendix 5

Analysis Report (Concrete) - Airsafe

TEST REPORT

August 15, 2013

Precision Demolition

PO Box 3178
ASQUITH NSW 2077

Your Reference: Port Kembla Copper Stack
Job Number: 20356

Attention: Sean Miller

Dear Sean,

In accordance with your instructions, Airsafe tested samples from the above site for asbestos content.

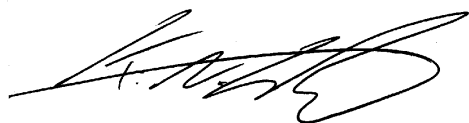
The following samples were processed on the dates indicated.

Samples:	6 Samples
Date of Sample Receipt:	14/08/13
Date of Sample Analysis:	15/08/13
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

A handwritten signature in black ink, appearing to read "K. White", written in a cursive style.

Kieran White
Approved Identifier and Signatory

PROJECT: Port Kembla Copper Stack**JOB NO: 20356**

Sample No	Location/Reference	Sample Description	Asbestos ID - Material
20356-1	Outside Concrete Shell – OS 1	73g debris	No asbestos detected
20356-2	Outside Concrete Shell – OS 2	75g debris	No asbestos detected
20356-3	Outside Concrete Shell – OS 3	69g debris	No asbestos detected
20356-4	Inside Concrete Shell – IS 1	71g debris	No asbestos detected
20356-5	Inside Concrete Shell – IS 2	84g debris	No asbestos detected
20356-6	Inside Concrete Shell – IS 3	70g debris	No asbestos detected

Method: Samples have been analysed using polarised light microscopy including dispersion staining in accordance with the Method for the qualitative identification of asbestos in bulk samples [AS 4964 – 2004] and in-house method AS102 - Method for the Qualitative Identification of Asbestos in Bulk Samples.

Sampling: Samples have been analysed on an “as received” basis. All sampling conducted by the customer. All data supplied by the customer.

Note: The results relate only to the samples tested.

Comment: Even after disintegration of certain bulk samples (vinyl tiles and bituminous type materials), the detection of fibres may be difficult when using Polarised Light Microscopy and Dispersion Staining Techniques. This may be due to the matrix of the sample (uneven distribution), or fine fibres that are difficult to detect and positively identify.

Certificate of Analysis

Report: 2294-01-ID

Job Number: 2294

URI Number: ID3125144657

Date of Analysis: 5/12/2013

Date of Report: 5/12/2013

Client: Port Kembla Copper

Client Address: Military Road Port Kembla NSW 2505

Sampled By: Ryan Heckenberg

Date Received: 5/12/2013

Client Contact: Ian Wilson

Site address: Port Kembla Copper Main Stack, Asbestos Analysis, Flintkote, December 2013

Test Method: Asbestos identification in bulk samples by polarised light microscopy and Dispersion Staining, in accordance with AS 4964-2004 Method for the Qualitative Identification of Asbestos in Bulk Samples and Clearsafe Method SOP.ID.01.

Notes:

- The results contained within this report relate only to the samples tested.
- This report should not be copied, presented or reviewed except in full.
- Detection Limit - 0.1g/kg (AS 4964)
- An independent analytical technique is recommended for the confirmation of vinyl and bituminous sample results



NATA ACCREDITED LABORATORY NO. 18542
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and / or measurements included in this document are traceable to Australian/national standards.

Sample No.	Sample Location	Sample Description	Analytical Result
2294 / 1	Level 2 inner chimney support condrel, upper surface coating	Black paint system - 20x20x0.5mm	No Asbestos Detected
2294 / 2	Level 3 inner chimney support condrel, upper surface coating	Black paint system - 20x20x0.5mm	No Asbestos Detected
2294 / 3	Level 4 inner chimney support condrel, upper surface coating	Black paint system - 20x20x0.5mm	No Asbestos Detected
2294 / 4	Level 5 inner chimney support condrel, upper surface coating	Black paint system - 20x20x0.5mm	No Asbestos Detected

Approved Identifier:



Ryan Heckenberg

Approved Signatory:



Ryan Heckenberg

Analytical Result Key:

Org: Organic Fibre

SMF: Synthetic Mineral Fibre

UMF: Unknown Mineral Fibre

FCS: Fibrous Cement Sheeting

VFT: Vinyl Floor Tile

07/02/2014

File Reference: 1007-03-LT

Ian Wilson
Port Kembla Copper
Military Road
Port Kembla NSW 2505

Re: Asbestos Analysis Report 1007-05-ID Dated 18/5/2011

Dear Ian,

Clearsafe Environmental Solutions Pty Ltd (Clearsafe) is pleased to provide our consulting and laboratory services to Port Kembla Copper with regard to the Main Stack Demolition Project.

With regard to the above analytical report, and specifically sample reference 1007/27 (Main Stack Level 10 Mortar on Top of Seal, Dark Grey Mortar with Adhering Fibrous Matting, Chrysotile Asbestos Detected):

- This sample was personally analysed by Ryan Heckenberg, the undersigned;
- My understanding at the time of analysis was that the suspected asbestos matting was a 'gas seal' between the distinct 'levels' of the stack, hence the word 'seal' has been used. The material in question though is without doubt the woven Chrysotile asbestos matting used as a gasket between each inner brick chimney level, that has been subsequently removed by Precision Demolition and with myself as the Licensed Asbestos Assessor providing final clearance;
- The sample consisted of mortar that had been in direct contact with the underlying gasket / seal, the mortar had visible fibres adhering to it, a likely consequence of that individual course of mortar being wet-laid directly on top of a Chrysotile asbestos matt / rope product;
- The 'adhering fibres' were not part of the matrix of the mortar, but rather appeared as a contaminant from the underlying gasket;
- I recall the analysis detecting Chrysotile asbestos within the 'fibrous matting' component of the sample;
- I do not recall any visible fibres being present within the 'mortar' component of the sample;
- This sample was basically of a piece of the asbestos gasket adhering to the adjoining mortar.

For any queries or further information please contact the Clearsafe team on 1300 042 962 or info@clearsafe.com.au.

Kind Regards,



Ryan Heckenberg
Occupational Hygienist



ISO 9001:2008 Certified

Clearsafe Environmental Solutions Pty Ltd ABN: 31 146 947 766
NATA Accredited Laboratory Number 18542
16 Stewart St, Wollongong NSW 2500
PO Box 337, Unanderra NSW 2526
Tel. 1300 042 962 Fax. 02 4228 6275

Website: www.clearsafe.com.au Email: info@clearsafe.com.au



PORT KEMBLA COPPER CHIMNEY

Asbestos Investigation Report

Internal Brick Shell



PORT KEMBLA COPPER

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Airsafe Pty Ltd Report 7

Introduction

On receipt of an enquiry by a member of the public Mr. Ian Wilson of Port Kembla Copper Pty Ltd requested that testing be undertaken to determine if asbestos material had been incorporated in the brick matrix at the time of construction. Two samples were taken from the internal brick shell from Level 3 and Level 8 and tested for asbestos contamination.

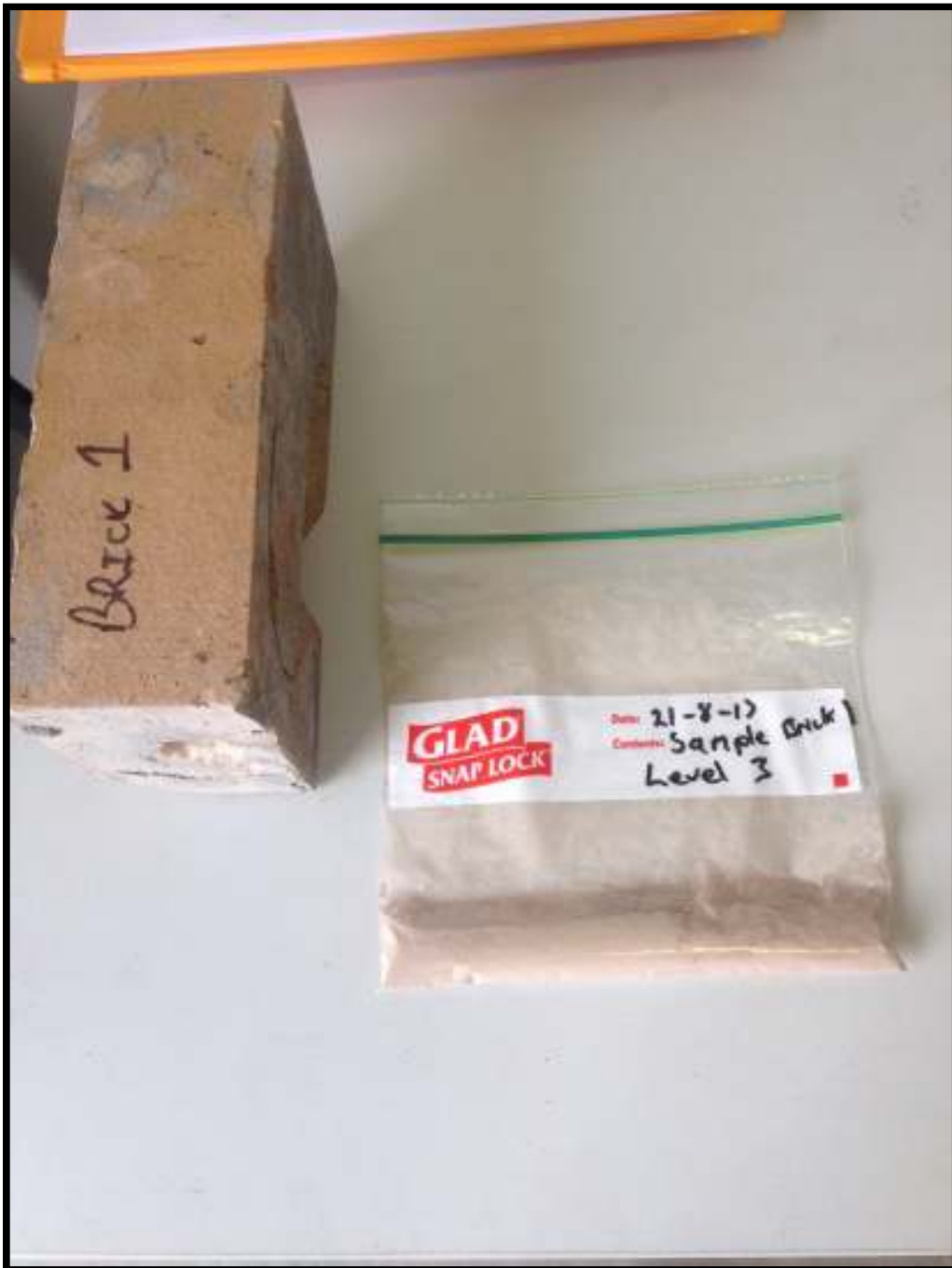
Intellectual Property

The content and intent of this report is the intellectual property of Precision Demolition and is issued for use on this project only.

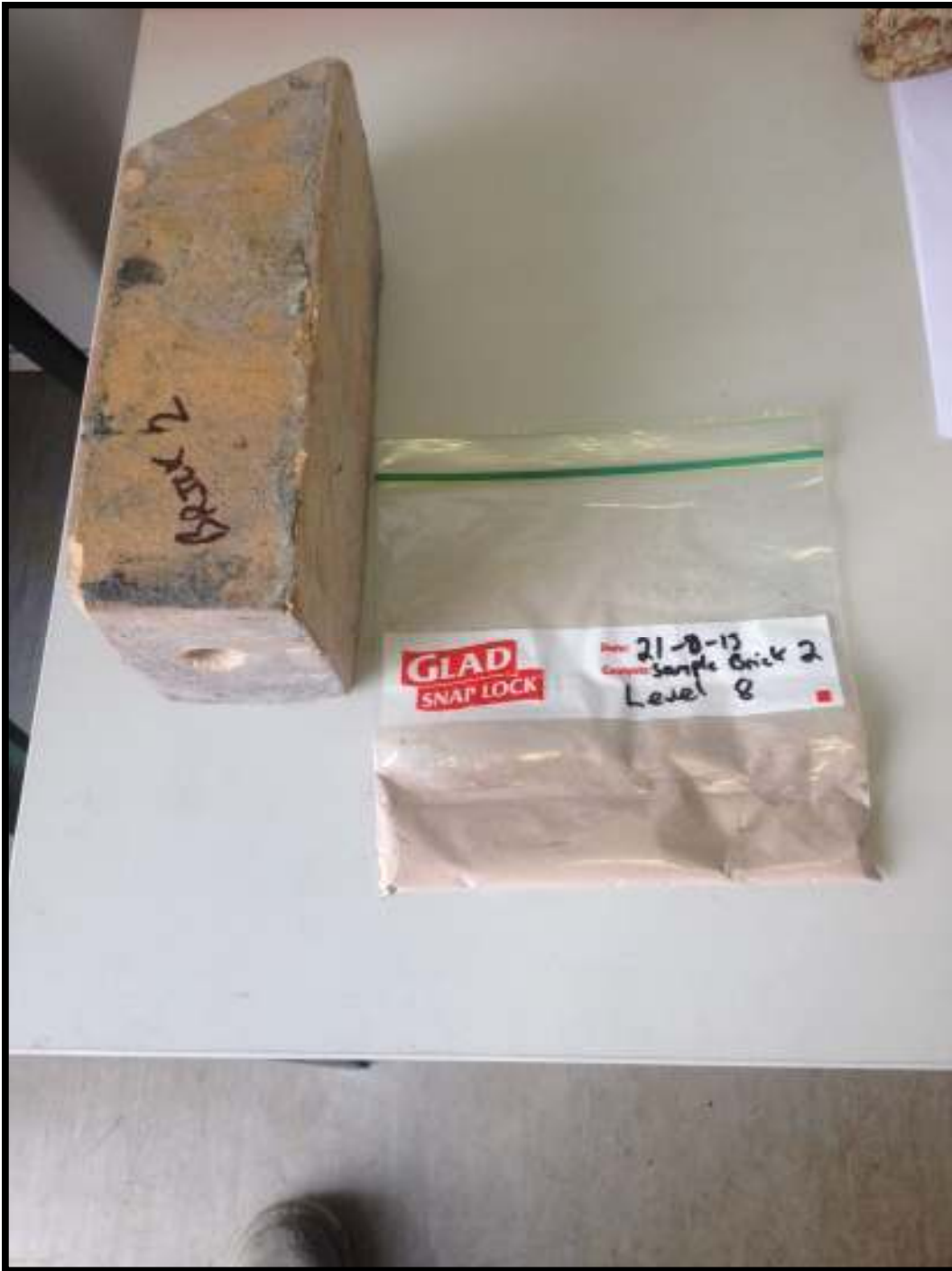
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Method

Bricks were collected from Level 3 and Level 8. The bricks were then drilled to a depth of 100mm and the drilled brick materials were collected and bagged for testing.



Level 3 brick sample.



Level 8 brick sample.

Conclusion

All collected samples were delivered to a NATA accredited laboratory, for testing for the presence of asbestos materials. All samples were tested and found not to contain any asbestos materials.

Attachment A shows the test results carried out by Airsafe Pty Ltd.

ATTACHMENT A

Airsafe Pty Ltd Report

TEST REPORT

August 22, 2013

Precision Demolition

PO Box 3178
ASQUITH NSW 2077

Your Reference: Port Kembla Copper Stack
Job Number: 20437

Attention: Sean Miller

Dear Sean,

In accordance with your instructions, Airsafe tested samples from the above site for asbestos content.

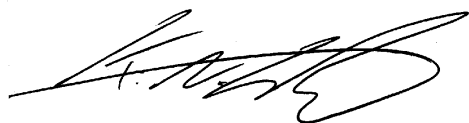
The following samples were processed on the dates indicated.

Samples:	2 Samples
Date of Sample Receipt:	22/08/13
Date of Sample Analysis:	22/08/13
Date of Preliminary Report Sent:	Not Issued

The results are contained in the following pages of this report.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
AIRSAFE OHC PTY LTD

A handwritten signature in black ink, appearing to read "K. White", written in a cursive style.

Kieran White
Approved Identifier and Signatory

PROJECT: Port Kembla Copper Stack**JOB NO: 20437**

Sample No	Location/Reference	Sample Description	Asbestos ID - Material
20437-1	Sample Brick 1 – Level 3	57g debris	No asbestos detected
20437-2	Sample Brick 2 – Level 8	64g debris	No asbestos detected

Method: Samples have been analysed using polarised light microscopy including dispersion staining in accordance with the Method for the qualitative identification of asbestos in bulk samples [AS 4964 – 2004] and in-house method AS102 - Method for the Qualitative Identification of Asbestos in Bulk Samples.

Sampling: Samples have been analysed on an “as received” basis. All sampling conducted by the customer. All data supplied by the customer.

Note: The results relate only to the samples tested.

Comment: Even after disintegration of certain bulk samples (vinyl tiles and bituminous type materials), the detection of fibres may be difficult when using Polarised Light Microscopy and Dispersion Staining Techniques. This may be due to the matrix of the sample (uneven distribution), or fine fibres that are difficult to detect and positively identify.

Table 1 - Brick Analytical Results (residue)
PKC - Stack Demolition

Golder Sample No			SBR03 L2 26/09/2013/ (South 2T) Scrape	SB03 L4 26/09/2013/ (East 4T) Scrape			
Side Sampled			Inside	Inside			
Method			Scrape	Scrape			
Sample Date			26/09/2013	26/09/2013			
Analyte	Unit	LOR			Concentrations		
Total Metals					Min.	Max.	Average
Antimony	mg/kg	5	<5	9	<5	9	7
Arsenic	mg/kg	5	95	3630	95	3630	1862.5
Cadmium	mg/kg	1	6	48	6	48	27
Chromium	mg/kg	2	4	5	4	5	4.5
Copper	mg/kg	5	177	1880	177	1880	1028.5
Iron	mg/kg	50	5070	2920	2920	5070	3995
Lead	mg/kg	5	15	841	15	841	428
Nickel	mg/kg	2	5	6	5	6	5.5
Selenium	mg/kg	5	42	33500	42	33500	16771
Vanadium	mg/kg	5	7	<5	<5	7	6
Zinc	mg/kg	5	522	2000	522	2000	1261
Mercury	mg/kg	0.1	0.1	<0.1	<0.1	0.1	0.1
Sample Preparation Method							
Amount	kg	0.01	1	1			

Legend:

LOR - Limit of Reporting

Inside: Expose to emissions

Table 2 - Brick Analytical Results (Exposed Bricks)
PKC - Stack Demolition

Golder Sample No			SBR01 L3 26/09/2013/ (East 3T)	SBR02 L3 26/09/2013/ (West 3T)	SBR03 L3 26/09/2013/ (South 3T)	SBR01 L4 26/09/2013/ (West 4T)	SB01 L4 26/09/2013/ (South 4T)			
Side Sampled			Inside	Inside	Inside	Inside/Outside	Inside/Outside			
Method			Crush	Crush	Crush	Crush	Crush			
Sample Date			26/09/2013	26/09/2013	26/09/2013	26/09/2013	26/09/2013			
Analyte	Unit	LOR						Concentrations		
Total Metals								Min.	Max.	Average
Antimony	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic	mg/kg	5	88	12	64	59	225	12	225	89.6
Cadmium	mg/kg	1	8	8	11	14	12	8	14	10.6
Chromium	mg/kg	2	83	58	106	104	56	56	106	81.4
Copper	mg/kg	5	130	40	126	382	406	40	406	216.8
Iron	mg/kg	50	5750	6710	6700	8270	9340	5750	9340	7354
Lead	mg/kg	5	13	<5	<5	8	<5	<5	13	7.2
Nickel	mg/kg	2	5	3	6	7	9	3	9	6
Selenium	mg/kg	5	185	45	12	101	48	12	185	78.2
Vanadium	mg/kg	5	7	9	8	10	14	7	14	9.6
Zinc	mg/kg	5	237	111	363	1140	633	111	1140	496.8
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sample Preparation Method										
Amount	kg	0.01	3.8	3.2	0.8	3.8	3.5			
Asbestos										
Asbestos detected	-	-	No	No	No	No	No			

Legend:

LOR - Limit of Reporting

Inside: Expose to emissions

Table 3 - Brick Analytical Results (Bricks Not Exposed)
PKC - Stack Demolition

Golder Sample No			SB02 L2 26/09/2013/ (West 2C)	SB03 L2 26/09/2013/ (South 2C)	SB01 L3 26/09/2013/ (East 3C)	SB02 L3 26/09/2013/ (West 3C)	SB03 L3 26/09/2013/ (South 3C)			
Side Sampled			Outside	Outside	Outside	Outside	Outside			
Method			Crush	Crush	Crush	Crush	Crush			
Sample Date			26/09/2013	26/09/2013	26/09/2013	26/09/2013	26/09/2013			
Analyte	Unit	LOR						Concentrations		
Total Metals								Min.	Max.	Average
Antimony	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic	mg/kg	5	<5	<5	9	18	23	<5	23	12
Cadmium	mg/kg	1	<1	2	10	6	12	1	12	6.2
Chromium	mg/kg	2	49	43	61	91	72	43	91	63.2
Copper	mg/kg	5	8	73	1170	208	416	8	1170	375
Iron	mg/kg	50	6780	6650	7040	5480	5750	5480	7040	6340
Lead	mg/kg	5	<5	<5	<5	12	<5	<5	12	6.4
Nickel	mg/kg	2	2	2	7	4	6	2	7	4.2
Selenium	mg/kg	5	<5	<5	5	<5	<5	<5	5	5
Vanadium	mg/kg	5	11	10	10	7	9	7	11	9.4
Zinc	mg/kg	5	15	264	1120	269	1100	15	1120	553.6
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sample Preparation Method										
Amount	kg	0.01	3.5	3.1	3.1	2.7	3.1			
Asbestos										
Asbestos detected	-	-	No	No	No	No	No			

Legend:

LOR - Limit of Reporting

Outside: Not expose to emissions

Table 4 - Bricks Analytical Results - Average Concentrations of Different Sample Types
PKC - Stack Demolition

			Scrape Bricks (Table 1)	Inside Bricks (Expose to emissions) Table 2	Outside Bricks (Not expose to emissions) Table 3
Analyte	Unit	LOR			
Total Metals			Average	Average	Average
Antimony	mg/kg	5	7	<5	<5
Arsenic	mg/kg	5	1862.5	89.6	12
Cadmium	mg/kg	1	27	10.6	6.2
Chromium	mg/kg	2	4.5	81.4	63.2
Copper	mg/kg	5	1028.5	216.8	375
Iron	mg/kg	50	3995	7354	6340
Lead	mg/kg	5	428	7.2	6.4
Nickel	mg/kg	2	5.5	6	4.2
Selenium	mg/kg	5	16771	78.2	5
Vanadium	mg/kg	5	6	9.6	9.4
Zinc	mg/kg	5	1261	496.8	553.6
Mercury	mg/kg	0.1	0.1	<0.1	<0.1

Legend:

LOR - Limit of Reporting

Inside: Expose to emissions

Outside: Not expose to emissions

Table 3 - Brick Analytical Results (Bricks Not Exposed)
PKC - Stack Demolition

Golder Sample No			SB02 L2 26/09/2013/ (West 2C)	SB03 L2 26/09/2013/ (South 2C)	SB01 L3 26/09/2013/ (East 3C)	SB02 L3 26/09/2013/ (West 3C)	SB03 L3 26/09/2013/ (South 3C)			
Side Sampled			Outside	Outside	Outside	Outside	Outside			
Method			Crush	Crush	Crush	Crush	Crush			
Sample Date			26/09/2013	26/09/2013	26/09/2013	26/09/2013	26/09/2013			
Analyte	Unit	LOR						Concentrations		
Total Metals								Min.	Max.	Average
Antimony	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic	mg/kg	5	<5	<5	9	18	23	<5	23	12
Cadmium	mg/kg	1	<1	2	10	6	12	1	12	6.2
Chromium	mg/kg	2	49	43	61	91	72	43	91	63.2
Copper	mg/kg	5	8	73	1170	208	416	8	1170	375
Iron	mg/kg	50	6780	6650	7040	5480	5750	5480	7040	6340
Lead	mg/kg	5	<5	<5	<5	12	<5	<5	12	6.4
Nickel	mg/kg	2	2	2	7	4	6	2	7	4.2
Selenium	mg/kg	5	<5	<5	5	<5	<5	<5	5	5
Vanadium	mg/kg	5	11	10	10	7	9	7	11	9.4
Zinc	mg/kg	5	15	264	1120	269	1100	15	1120	553.6
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sample Preparation Method										
Amount	kg	0.01	3.5	3.1	3.1	2.7	3.1			
Asbestos										
Asbestos detected	-	-	No	No	No	No	No			

Legend:

LOR - Limit of Reporting

Outside: Not expose to emissions

Table 4 - Bricks Analytical Results - Average Concentrations of Different Sample Types
PKC - Stack Demolition

			Scrape Bricks (Table 1)	Inside Bricks (Expose to emissions) Table 2	Outside Bricks (Not expose to emissions) Table 3
Analyte	Unit	LOR			
Total Metals			Average	Average	Average
Antimony	mg/kg	5	7	<5	<5
Arsenic	mg/kg	5	1862.5	89.6	12
Cadmium	mg/kg	1	27	10.6	6.2
Chromium	mg/kg	2	4.5	81.4	63.2
Copper	mg/kg	5	1028.5	216.8	375
Iron	mg/kg	50	3995	7354	6340
Lead	mg/kg	5	428	7.2	6.4
Nickel	mg/kg	2	5.5	6	4.2
Selenium	mg/kg	5	16771	78.2	5
Vanadium	mg/kg	5	6	9.6	9.4
Zinc	mg/kg	5	1261	496.8	553.6
Mercury	mg/kg	0.1	0.1	<0.1	<0.1

Legend:

LOR - Limit of Reporting

Inside: Expose to emissions

Outside: Not expose to emissions

CERTIFICATE OF ANALYSIS

Work Order	: EB1323666	Page	: 1 of 5
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: MR GRAEME MILLER	Contact	: Rebecca Kleinschmidt
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: grmiller@golder.com.au	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 3552 8668
Facsimile	: +61 02 9478 3901	Facsimile	: +61 7 3352 3662
Project	: 107623114	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 27-SEP-2013
Sampler	: Carolina	Issue Date	: 04-OCT-2013
Site	: Port Kembla (200m Stack)		
Quote number	: EN/002/12	No. of samples received	: 12
		No. of samples analysed	: 12

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Jonathon Angell	Inorganic Coordinator	Brisbane Acid Sulphate Soils
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- A portion of the crush for samples 2-11 was pulverised to ~75µm and again received barren rinses between each sample of washed, clean Sand. The Pulverised samples have been analysed for Metals only.
- EA200 Legend
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres detected at levels below 0.1g/kg. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Samples 1 and 12 have been scraped as requested and this service will be covered by the EN84 Dry and Pulverise code. Metals analysis has been carried out on these samples only on a dry weight basis.
- Samples 2-11 have been Dried at 80°C before Crushing to ~6mm. Each sample received a barren Quartz rinse between to prevent cross contamination between each sample. The resulting bulk material was riffle split and a analysed by ALS Newcastle for Asbestos.



Analytical Results

Sub-Matrix: BRICK (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	SBR03 L2 26/09/2013 (South 2T) Scrape	SB02 L2 26/09/2013 (West 2C)	SB03 L2 26/09/2013 (South 2C)	SBR01 L3 26/09/2013 (East 3T)	SBR02 L3 26/09/2013 (West 3T)
				26-SEP-2013 13:50	26-SEP-2013 13:50	26-SEP-2013 13:50	26-SEP-2013 12:25	26-SEP-2013 12:25
				EB1323666-001	EB1323666-002	EB1323666-003	EB1323666-004	EB1323666-005
EG005T: Total Metals by ICP-AES								
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	95	<5	<5	88	12
Cadmium	7440-43-9	1	mg/kg	6	<1	2	8	8
Chromium	7440-47-3	2	mg/kg	4	49	43	83	58
Copper	7440-50-8	5	mg/kg	177	8	73	130	40
Iron	7439-89-6	50	mg/kg	5070	6780	6650	5750	6710
Lead	7439-92-1	5	mg/kg	15	<5	<5	13	<5
Nickel	7440-02-0	2	mg/kg	5	2	2	5	3
Selenium	7782-49-2	5	mg/kg	42	<5	<5	185	45
Vanadium	7440-62-2	5	mg/kg	7	11	10	7	9
Zinc	7440-66-6	5	mg/kg	522	15	264	237	111
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Sample Preparation Method								
Amount	----	0.01	kg	1.00	3.50	3.10	3.80	3.20



Analytical Results

Sub-Matrix: BRICK (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	SBR03 L3 26/09/2013 (South 3T)	SB01 L3 26/09/2013 (East 3T)	SB02 L3 26/09/2013 (West 3T)	SB03 L3 26/09/2013 (South 3T)	SBR01 L4 26/09/2013 (West 4T)
				26-SEP-2013 12:25	26-SEP-2013 12:25	26-SEP-2013 12:25	26-SEP-2013 12:25	26-SEP-2013 12:08
EG005T: Total Metals by ICP-AES				EB1323666-006	EB1323666-007	EB1323666-008	EB1323666-009	EB1323666-010
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	64	9	18	23	59
Cadmium	7440-43-9	1	mg/kg	11	10	6	12	14
Chromium	7440-47-3	2	mg/kg	106	61	91	72	104
Copper	7440-50-8	5	mg/kg	126	1170	208	416	382
Iron	7439-89-6	50	mg/kg	6700	7040	5480	5750	8270
Lead	7439-92-1	5	mg/kg	<5	<5	12	<5	8
Nickel	7440-02-0	2	mg/kg	6	7	4	6	7
Selenium	7782-49-2	5	mg/kg	12	5	<5	<5	101
Vanadium	7440-62-2	5	mg/kg	8	10	7	9	10
Zinc	7440-66-6	5	mg/kg	363	1120	269	1100	1140
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Sample Preparation Method								
Amount	----	0.01	kg	0.80	3.10	2.70	3.10	3.80



Analytical Results

Sub-Matrix: BRICK (Matrix: SOIL)

Client sample ID

Client sampling date / time

				SB01 L4 26/09/2013 (South 4T) 26-SEP-2013 12:08 EB1323666-011	SB03 L4 26/09/2013 (East 4T) Scrape 26-SEP-2013 12:08 EB1323666-012	----	----	----
Compound	CAS Number	LOR	Unit					
EG005T: Total Metals by ICP-AES								
Antimony	7440-36-0	5	mg/kg	<5	9	----	----	----
Arsenic	7440-38-2	5	mg/kg	225	3630	----	----	----
Cadmium	7440-43-9	1	mg/kg	12	48	----	----	----
Chromium	7440-47-3	2	mg/kg	56	5	----	----	----
Copper	7440-50-8	5	mg/kg	406	1880	----	----	----
Iron	7439-89-6	50	mg/kg	9340	2920	----	----	----
Lead	7439-92-1	5	mg/kg	<5	841	----	----	----
Nickel	7440-02-0	2	mg/kg	9	6	----	----	----
Selenium	7782-49-2	5	mg/kg	48	33500	----	----	----
Vanadium	7440-62-2	5	mg/kg	14	<5	----	----	----
Zinc	7440-66-6	5	mg/kg	633	2000	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
Sample Preparation Method								
Amount	----	0.01	kg	3.50	1.00	----	----	----

QUALITY CONTROL REPORT

Work Order	: EB1323666	Page	: 1 of 5
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: MR GRAEME MILLER	Contact	: Rebecca Kleinschmidt
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: grmiller@golder.com.au	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 3552 8668
Facsimile	: +61 02 9478 3901	Facsimile	: +61 7 3352 3662
Project	: 107623114	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Port Kembla (200m Stack)	Date Samples Received	: 27-SEP-2013
C-O-C number	: ----	Issue Date	: 04-OCT-2013
Sampler	: Carolina	No. of samples received	: 12
Order number	: ----	No. of samples analysed	: 12
Quote number	: EN/002/12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



NATA Accredited
Laboratory 825

Accredited for
compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jonathon Angell	Inorganic Coordinator	Brisbane Acid Sulphate Soils
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC



Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 3085337)									
EB1323666-001	SBR03 L2 26/09/2013 (South 2T) Scrape	EG005T: Cadmium	7440-43-9	1	mg/kg	6	6	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	95	96	0.0	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	177	176	0.9	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	15	15	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	42	45	7.6	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	522	516	1.2	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	5070	5570	9.4	0% - 20%
EB1323666-011	SB01 L4 26/09/2013 (South 4T)	EG005T: Cadmium	7440-43-9	1	mg/kg	12	12	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	56	56	0.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.0	No Limit
		EG005T: Antimony	7440-36-0	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	225	232	2.8	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	406	418	2.8	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	48	48	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	14	14	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	633	655	3.4	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	9340	9590	2.6	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3085338)									
EB1323666-001	SBR03 L2 26/09/2013 (South 2T) Scrape	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.0	No Limit
EB1323666-011	SB01 L4 26/09/2013 (South 4T)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005T: Total Metals by ICP-AES (QCLot: 3085337)								
EG005T: Antimony	7440-36-0	5	mg/kg	<5	----	----	----	----
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	119	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	112	88	118
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	117	73	127
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	114	86	122
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	106	70	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	116	84	121
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	113	89	126
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	123	91	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	120	87	127
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3085338)								
EG035T: Mercury	7439-97-6	0.10	mg/kg	<0.1	2.57 mg/kg	104	78	114

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3085337)							
EB1323666-002	SB02 L2 26/09/2013 (West 2C)	EG005T: Arsenic	7440-38-2	50 mg/kg	107	70	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	115	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	120	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	114	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	117	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Vanadium	7440-62-2	50 mg/kg	116	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	116	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3085338)							
EB1323666-002	SB02 L2 26/09/2013 (West 2C)	EG035T: Mercury	7439-97-6	5.0 mg/kg	102	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report



The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EG005T: Total Metals by ICP-AES (QCLot: 3085337)										
EB1323666-002	SB02 L2 26/09/2013 (West 2C)	EG005T: Arsenic	7440-38-2	50 mg/kg	107	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	25 mg/kg	115	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	120	----	70	130	----	----
		EG005T: Copper	7440-50-8	50 mg/kg	114	----	70	130	----	----
		EG005T: Lead	7439-92-1	50 mg/kg	117	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	106	----	70	130	----	----
		EG005T: Vanadium	7440-62-2	50 mg/kg	116	----	70	130	----	----
		EG005T: Zinc	7440-66-6	50 mg/kg	116	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3085338)										
EB1323666-002	SB02 L2 26/09/2013 (West 2C)	EG035T: Mercury	7439-97-6	5.0 mg/kg	102	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: EB1323666	Page	: 1 of 5
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: MR GRAEME MILLER	Contact	: Rebecca Kleinschmidt
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: grmiller@golder.com.au	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 3552 8668
Facsimile	: +61 02 9478 3901	Facsimile	: +61 7 3352 3662
Project	: 107623114	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: Port Kembla (200m Stack)	Date Samples Received	: 27-SEP-2013
C-O-C number	: ----	Issue Date	: 04-OCT-2013
Sampler	: Carolina	No. of samples received	: 12
Order number	: ----	No. of samples analysed	: 12
Quote number	: EN/002/12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG005T: Total Metals by ICP-AES									
Pulp Bag (EG005T) SBR03 L2 26/09/2013 - (South 2T) Scrape, SB03 L2 26/09/2013 - (South 2C), SBR02 L3 26/09/2013 - (West 3T), SB01 L3 26/09/2013 - (East 3T), SB03 L3 26/09/2013 - (South 3T), SB01 L4 26/09/2013 - (South 4T),		SB02 L2 26/09/2013 - (West 2C), SBR01 L3 26/09/2013 - (East 3T), SBR03 L3 26/09/2013 - (South 3T), SB02 L3 26/09/2013 - (West 3T), SBR01 L4 26/09/2013 - (West 4T), SB03 L4 26/09/2013 - (East 4T) Scrape	26-SEP-2013	01-OCT-2013	25-MAR-2014	✓	03-OCT-2013	25-MAR-2014	✓
EG035T: Total Recoverable Mercury by FIMS									
Pulp Bag (EG035T) SBR03 L2 26/09/2013 - (South 2T) Scrape, SB03 L2 26/09/2013 - (South 2C), SBR02 L3 26/09/2013 - (West 3T), SB01 L3 26/09/2013 - (East 3T), SB03 L3 26/09/2013 - (South 3T), SB01 L4 26/09/2013 - (South 4T),		SB02 L2 26/09/2013 - (West 2C), SBR01 L3 26/09/2013 - (East 3T), SBR03 L3 26/09/2013 - (South 3T), SB02 L3 26/09/2013 - (West 3T), SBR01 L4 26/09/2013 - (West 4T), SB03 L4 26/09/2013 - (East 4T) Scrape	26-SEP-2013	01-OCT-2013	24-OCT-2013	✓	04-OCT-2013	24-OCT-2013	✓
Sample Preparation Method									
Snap Lock Bag (EN84) SBR03 L2 26/09/2013 - (South 2T) Scrape, SB03 L2 26/09/2013 - (South 2C), SBR02 L3 26/09/2013 - (West 3T), SB01 L3 26/09/2013 - (East 3T), SB03 L3 26/09/2013 - (South 3T), SB01 L4 26/09/2013 - (South 4T),		SB02 L2 26/09/2013 - (West 2C), SBR01 L3 26/09/2013 - (East 3T), SBR03 L3 26/09/2013 - (South 3T), SB02 L3 26/09/2013 - (West 3T), SBR01 L4 26/09/2013 - (West 4T), SB03 L4 26/09/2013 - (East 4T) Scrape	26-SEP-2013	----	----	----	01-OCT-2013	26-SEP-2013	✗



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Dry and Crush	EN84	SOIL	In House
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)



Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- For all matrices, no Method Blank value outliers occur.
- For all matrices, no Duplicate outliers occur.
- For all matrices, no Laboratory Control outliers occur.
- For all matrices, no Matrix Spike outliers occur.

Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: SOIL

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
Sample Preparation Method							
Snap Lock Bag							
SBR03 L2 26/09/2013 - (South 2T) Scrape,	SB02 L2 26/09/2013 - (West 2C),	----	----	----	01-OCT-2013	26-SEP-2013	5
SB03 L2 26/09/2013 - (South 2C),	SB01 L3 26/09/2013 - (East 3T),						
SBR02 L3 26/09/2013 - (West 3T),	SBR03 L3 26/09/2013 - (South 3T),						
SB01 L3 26/09/2013 - (East 3T),	SB02 L3 26/09/2013 - (West 3T),						
SB03 L3 26/09/2013 - (South 3T),	SB01 L4 26/09/2013 - (West 4T),						
SB01 L4 26/09/2013 - (South 4T),	SB03 L4 26/09/2013 - (East 4T) Scrape						

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.



AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref: ASET35429/ 38609 / 1 - 10

Your ref: EB1323666

NATA Accreditation No: 14484

2 October 2013

Australian Laboratory Services Pty Ltd
32 Shand Street
Stafford QLD 4053

Attn: Mr Matt Goodwin

Dear Matt

Asbestos Identification

This report presents the results of ten samples, forwarded by Australian Laboratory Services Pty Ltd on 2 October 2013, for analysis for asbestos.

1.Introduction:Ten samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Safer Environment Method 1.**)

3. Results : **Sample No. 1. ASET35429 / 38609 / 1. EB1323666 - 002 - SB02_L2_26/09/13 (West 2C)**

Approx dimensions 15.5 cm x 14.5 cm x 5.2 cm

The sample consisted of fragments of a refractive brick like material.

No asbestos detected.

Sample No. 2. ASET35429 / 38609 / 2. EB1323666 - 003 - SB03_L2_26/09/13 (South 2C)

Approx dimensions 16.0 cm x 15.0 cm x 5.1 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 3. ASET35429 / 38609 / 3. EB1323666 - 004 - SBR01_L3_26/09/13 (East 3T)

Approx dimensions 15.5 cm x 15.0 cm x 5.1 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 4. ASET35429 / 38609 / 4. EB1323666 - 005 - SBR02_L3_26/09/13 (West 3T)

Approx dimensions 16.5 cm x 15.5 cm x 5.0 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 5. ASET35429 / 38609 / 5. EB1323666 - 006 - SBR03_L3_26/09/13 (South 3T)

Approx dimensions 11.0 cm x 10.0 cm x 5.5 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635

PHONE: (02) 99872183 FAX: (02)99872151 EMAIL: aset@bigpond.net.au WEBSITE: www.Ausset.com.au

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Sample No. 6. ASET35429 / 38609 / 6. EB1323666 - 007 - SB01_L3_26/09/13 (East 3T)

Approx dimensions 18.0 cm x 17.5 cm x 4.1 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 7. ASET35429 / 38609 / 7. EB1323666 - 008 - SB02_L3_26/09/13 (West 3T)

Approx dimensions 20.0 cm x 18.5 cm x 6.4 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 8. ASET35429 / 38609 / 8. EB1323666 - 009 - SB03_L3_26/09/13 (South 3T)

Approx dimensions 21.0 cm x 20.0 cm x 8.0 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 9. ASET35429 / 38609 / 9. EB1323666 - 010 - SBR01_L4_26/09/13 (West 4T)

Approx dimensions 20.0 cm x 17.5 cm x 7.5 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Sample No. 10. ASET35429 / 38609 / 10. EB1323666 - 011 - SB01_L4_26/09/13 (South 4T)

Approx dimensions 20.0 cm x 18.5 cm x 6.9 cm

The sample consisted of fragments of refractive brick like material.

No asbestos detected.

Analysed and reported by,

A handwritten signature in black ink, appearing to read 'Nisansala Maddage', written over a light blue horizontal line.

**Nisansala Maddage. BSc(Hons)
Environmental Scientist/Approved Identifier
Approved Signatory**



**This document is issued in accordance with
NATA's Accreditation requirements. Accredited
for compliance with ISO/IEC 17025.**

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet of

107623114		ALS Environmental		GOLDER ASSOCIATES PTY LTD 124 Pacific Highway, Greenwich Project Manager: <u>Gracine Miller</u> Job Contact: <u>Carolina Olmos</u>		Phone: (02) 9478 3900 Fax: (02) 9478 3901 Email: <u>colmos@golder.com.au</u>		 Golder Associates											
Port Kembla (200m Stack)		89 / 784 / 13																	
Carolina Olmos (Golder), (Work Cover)																			
24hrs ☒ 48hrs ☐ Standard ☐		36hrs ☐ 5 Days ☐ Date Required By:																	
HARD ☐ FAX ☐ DISK ☐ EMAIL ☒ BULLETIN BOARD ☐		PDF ☒ EXCEL ☐ ESDAT ☒ EQUIS ☒		ANALYSIS REQUIRED															
Comments/Special Instructions: Please email report to <u>gmliller@golder.com.au</u> , <u>lquistos@golder.com.au</u> and <u>colmos@golder.com.au</u> Please crush and homogenise the individual brick samples prior to analysis. Please send to ALS Brisbane ASAP				No CONTAINERS	Level of Contamination (Low/High/Unknown)	Arsenic	Antimony	Cadmium	Copper	Lead	Mercury	Vanadium	Zinc	Selenium	Chromium	Iron	Nickel	Asbestos	HOLD
LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX															
Scrape	SBR01 L2 26/09/2013			Brick															
	SBR02 L2 26/09/2013	26/9/13	13:50	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR03 L2 26/09/2013			Brick															
	SBR01 L2 26/09/2013			Brick															
C+H	SBR02 L2 26/09/2013	26/9/13	13:50	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR03 L2 26/09/2013		13:50	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
C+H	SBR01 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR02 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR03 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
C+H	SBR01 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR02 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR03 L3 26/09/2013		12:25	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
C+H	SBR01 L4 26/09/13		12:08	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR02 L4 26/09/13		12:08	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X
	SBR03 L4 26/09/13		12:08	Brick	1	U	X	X	X	X	X	X	X	X	X	X	X	X	X

Environmental Division
Brisbane
Work Order
EB1323666

Telephone: +61-7-3243 7222

SAMPLE MATRIX = Soil/Sediment/Fill/Water/Other		SAMPLE TYPE = Composite/Cy/Discrete/DC/Disturbed/DS/Cover/CR/Grab Sample (GS)		HIGH CONCENTRATION: circle expected parameters in analysis list			
SIGNATURE	COMPANY	DATE	TIME	SIGNATURE	COMPANY	DATE	TIME
RELEASED BY: <u>CAROLINA OLMS</u>	Golder Associates/WorkCover NSW	26/09/13	2:50pm				
RECEIVED BY: <u>Aneta</u>	ALS	26/9/13	14:50				
RELEASED BY:							
RECEIVED BY:							

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EB1323666**

Client : **GOLDER ASSOCIATES**
 Contact : **MR GRAEME MILLER**
 Address : **LEVEL 1, 124 PACIFIC HIGHWAY**
ST LEONARDS NSW, AUSTRALIA
2065

Laboratory : Environmental Division Brisbane
 Contact : **Rebecca Kleinschmidt**
 Address : **2 Byth Street Stafford QLD Australia**
4053

E-mail : **grmiller@golder.com.au**
 Telephone : **+61 02 9478 3900**
 Facsimile : **+61 02 9478 3901**

E-mail : **rebecca.kleinschmidt@alsglobal.com**
 Telephone : **+61 3552 8668**
 Facsimile : **+61 7 3352 3662**

Project : **107623114**
 Order number : **----**
 C-O-C number : **----**
 Site : **Port Kembla (200m Stack)**
 Sampler : **Carolina**

Page : **1 of 3**
 Quote number : **ES2012GOLASS0442 (EN/002/12)**
 QC Level : **NEPM 2013 Schedule B(3) and ALS**
QCS3 requirement

Dates

Date Samples Received : **27-SEP-2013**
 Client Requested Due Date : **04-OCT-2013**

Issue Date : **30-SEP-2013 15:03**
 Scheduled Reporting Date : **04-OCT-2013**

Delivery Details

Mode of Delivery : **Carrier**
 No. of coolers/boxes : **----**
 Security Seal : **Intact.**

Temperature : **----**
 No. of samples received : **12**
 No. of samples analysed : **12**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample receipt time has been allocated as when ALS Brisbane received samples from ALS Sydney.**
- **Please be advised that samples 1 and 12 will be scraped as requested and this service will be covered by the EN84 Dry and Pulverise code. Metals analysis will be added to these samples only.**
- **Samples 2-11 will be Dried at 80°C before Crushing to ~6mm. Each sample will receive a barren Quartz rinse between to prevent cross contamination of samples. The resulting bulk material will be riffle split and a portion sent to ALS Newcastle for Asbestos and a portion sent to be Pulverised.**
- **Samples 2-11 will then be pulverised to ~75µm and again will receive a barren rinse between samples of washed, clean Sand. The resulting Pulverised sample will be analysed for Metals only as Specified.**
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Asbestos analysis will be subcontracted to Asset.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Matt Goodwin.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958),
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EB1323666-001	: 26-SEP-2013 13:50	: SBR03 L2 26/09/2013 - (South 2T) Scrape
EB1323666-002	: 26-SEP-2013 13:50	: SB02 L2 26/09/2013 - (West 2C)
EB1323666-003	: 26-SEP-2013 13:50	: SB03 L2 26/09/2013 - (South 2C)
EB1323666-004	: 26-SEP-2013 12:25	: SBR01 L3 26/09/2013 - (East 3T)
EB1323666-005	: 26-SEP-2013 12:25	: SBR02 L3 26/09/2013 - (West 3T)
EB1323666-006	: 26-SEP-2013 12:25	: SBR03 L3 26/09/2013 - (South 3T)
EB1323666-007	: 26-SEP-2013 12:25	: SB01 L3 26/09/2013 - (East 3T)
EB1323666-008	: 26-SEP-2013 12:25	: SB02 L3 26/09/2013 - (West 3T)
EB1323666-009	: 26-SEP-2013 12:25	: SB03 L3 26/09/2013 - (South 3T)
EB1323666-010	: 26-SEP-2013 12:08	: SBR01 L4 26/09/2013 - (West 4T)
EB1323666-011	: 26-SEP-2013 12:08	: SB01 L4 26/09/2013 - (South 4T)
EB1323666-012	: 26-SEP-2013 12:08	: SB03 L4 26/09/2013 - (East 4T) Scrape

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - ASB-SOL (Subcontracted) Asbestos - Count (Solid)	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EN84 Dry and Crush
EB1323666-001	26-SEP-2013 13:50	SBR03 L2 26/09/2013 ...		✓	✓	✓
EB1323666-002	26-SEP-2013 13:50	SB02 L2 26/09/2013 ...	✓	✓	✓	✓
EB1323666-003	26-SEP-2013 13:50	SB03 L2 26/09/2013 ...	✓	✓	✓	✓
EB1323666-004	26-SEP-2013 12:25	SBR01 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-005	26-SEP-2013 12:25	SBR02 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-006	26-SEP-2013 12:25	SBR03 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-007	26-SEP-2013 12:25	SB01 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-008	26-SEP-2013 12:25	SB02 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-009	26-SEP-2013 12:25	SB03 L3 26/09/2013 ...	✓	✓	✓	✓
EB1323666-010	26-SEP-2013 12:08	SBR01 L4 26/09/2013 ...	✓	✓	✓	✓
EB1323666-011	26-SEP-2013 12:08	SB01 L4 26/09/2013 ...	✓	✓	✓	✓
EB1323666-012	26-SEP-2013 12:08	SB03 L4 26/09/2013 ...		✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

MR GRAEME MILLER

- *AU Certificate of Analysis - NATA (COA)	Email	grmiller@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	grmiller@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	grmiller@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	grmiller@golder.com.au
- A4 - AU Tax Invoice (INV)	Email	grmiller@golder.com.au
- Chain of Custody (CoC) (COC)	Email	grmiller@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	grmiller@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	grmiller@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	grmiller@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	grmiller@golder.com.au

MS CAROLINA OLMOS

- *AU Certificate of Analysis - NATA	Email	colmos@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	colmos@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	colmos@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT	Email	colmos@golder.com.au
- Chain of Custody (CoC)	Email	colmos@golder.com.au
- EDI Format - ENMRG	Email	colmos@golder.com.au
- EDI Format - EQUIS V5 Generic	Email	colmos@golder.com.au
- EDI Format - ESDAT	Email	colmos@golder.com.au
- EDI Format - GOLDER_EXCEL	Email	colmos@golder.com.au

MS FABIANA QUINTON

- *AU Certificate of Analysis - NATA	Email	fquinton@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	fquinton@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	fquinton@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT	Email	fquinton@golder.com.au
- Chain of Custody (CoC)	Email	fquinton@golder.com.au
- EDI Format - ENMRG	Email	fquinton@golder.com.au
- EDI Format - EQUIS V5 Generic	Email	fquinton@golder.com.au
- EDI Format - ESDAT	Email	fquinton@golder.com.au
- EDI Format - GOLDER_EXCEL	Email	fquinton@golder.com.au

THE ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	auaccountspayable@golder.com.au
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APPENDIX F

Dust Suppression Device Specifications



www.dustboss.com

DB-60 FAQ's >

WATER REQUIREMENTS

> HOW MANY GALLONS PER MINUTE DOES THE DB-60 USE?

To estimate your flow rates at different water pressures, please see the table below:

ENGLISH UNITS	WITHOUT BOOSTER PUMP				WITH BOOSTER PUMP		
Water Pressure, psi	40	60	80	100	160	180	200
Water Flow, gpm	12	14.6	16.9	18.9	23.9	25.4	26.7
METRIC UNITS							
Water Pressure, bar	2.8	4.14	5.5	6.89	11	12.4	13.8
Water Flow, lpm	45.3	55.4	64.0	71.8	90.5	96.0	101.2
1-1/2" FIRE HOSE WATER SUPPLY							

> IS THERE A MINIMUM AMOUNT OF WATER PRESSURE NEEDED?

The DB-60 requires a minimum of 10PSI (0.69 BAR) constant pressure to be delivered to the booster pump.

> IS THERE A MAXIMUM WATER PRESSURE?

The DB-60 should not be used at water pressures above 100 PSI (6.89 BAR).

> WHAT KIND OF HOSE CONNECTION DO I NEED?

The DB-60 comes with a 1-1/2" (38.10 mm) cam quick release. Keep in mind that all areas have unique fittings, so be aware of what your area uses. We provide the most universal fit.

> CAN I USE WATER FROM A LAKE OR POND?

Yes. The unit comes with a pre-filter so that non-potable water may be used. You will need to provide a high volume/low pressure pump (trash pump) to move the water to the machine if you are pulling water from a lake or pond.

ELECTRICAL REQUIREMENTS

> WHAT KIND OF POWER IS NEEDED FOR A DB-60?

U.S. specs: 3 Phase / 25 HP fan / 480 Volt / 60 Hertz.
Full load current is 46 amps. 60 Kw gen set is recommended.

> CAN THE DUSTBOSS BE USED OVERSEAS?

Yes, international motors are available. Please let us know your requirements and we will quote you a price.



GENERAL INFORMATION

> HOW MUCH COVERAGE DOES A DB-60 PROVIDE?

The DB-60 can cover up to 21,000 sq. ft. (1,950 sq. meters).

> HOW FAR DOES THIS UNIT THROW?

The DB-60 can throw up to 200 ft. (60 m.).

> HOW POWERFUL IS THE FAN?

The fan generates 30,000 CFM (849.50 CMM).

> WHAT IS THE DROPLET SIZE OF THE DB-60?

The DB-60 sprays a mist of water droplets measuring 50–200 microns in size.

> HOW BIG IS THE DB-60?

The DB-60 is 6.83 ft. (81 in., or 2.08 m.) wide x 9 ft. (108 in., or 2.97 m.) long x 6 ft. (72 in., or 1.80 m.) tall.

> HOW MUCH DOES THE DB-60 WEIGH?

The DB-60 weighs 1800 lbs. (816.50 kg).

> CAN THE CARRIAGE BE USED TO TRANSPORT THE UNIT?

The carriage is perfect to move the DustBoss anywhere around your job site. It may not, however, be used for highway transport. The DustBoss needs to be loaded on a trailer for highway transport.

OVER FOR MORE FAQ's >



DustControlTechnology®

> CALL: 1 (800) 707-2204 (U.S.)
+1 (309) 693-8600 (Int'l)

> 24 HR Technical Support: 309-645-3691
www.dustboss.com

MORE FAQ's >

GENERAL QUESTIONS

> HOW LONG DOES IT TAKE TO GET A UNIT?

If you are considering renting or purchasing a DB-60, it is best to get the ball rolling as soon as possible. This is a high-quality product that takes time to build.

> WHAT IS THE DUST CONTROL GUARANTEE?

We stand behind our units 100% — that's why our units come with the best warranty in the industry. We guarantee both the technology and the quality of the DustBoss.

OUR TECHNOLOGY GUARANTEE: Rent the DustBoss, and we'll give you one week to try the proven worldwide leader in dust suppression. If you are not completely satisfied that this is the best dust and/or odor controller that you have ever used, you may return the machine, and we will not charge you the rent. You will, however, be responsible for freight in and freight back.

OUR QUALITY GUARANTEE: All electrical DustBoss units are covered by a FULL 3-YEAR/3,000-HOUR WARRANTY.

> HOW ARE THE UNITS SHIPPED TO THE CUSTOMERS?

The machines are shipped to you by common carrier, flatbed, or FedEx Freight. The customer is responsible for freight in and freight out, or the customer may arrange for shipping of the unit themselves.

> WHAT KIND OF MAINTENANCE IS REQUIRED?

The DustBoss requires very little maintenance. The fan motor and high pressure pump should be greased every 10,000 hours and the oscillator should be greased regularly, or as needed. If using potable water, the nozzles should be inspected once a year.

Maintenance for below freezing conditions is simple and involves disconnecting the black hose from misting ring and allowing it to drain, and releasing the drain valve under the high pressure pump and turning the lever to its vertical position to drain.

> WILL THE UNIT MAKE SNOW IN COLD WEATHER?

NO. It can perform odor and dust control below freezing weather.

> CAN THE UNITS BE USED INDOORS?

Transfer stations have had tremendous success using the smaller DB-30 units indoors at facilities. The DB-60 is generally used in outdoor applications.

> HOW CAN I GET TECHNICAL SUPPORT?

Be sure to read the operating and parts manual first to find related information. For 24/7 tech support, call (309) 645-3691.

ODOR CONTROL

> HOW DOES THE DUSTBOSS CONTROL ODOR?

The DB-60 can be equipped with a dosing pump to use with odor control chemicals for odor control. The dosing pump is not a standard feature, so please ask about pricing it when requesting a quote.

> CAN I USE OTHER ADDITIVES FOR DUST CONTROL?

The dosing pump can also be used with surfactants to improve binding of dust particles or with tactifying agents to seal the ground and help prevent dust from becoming airborne.

NOISE LEVELS

> WHAT ARE THE NOISE LEVELS OF THIS UNIT?

If you are standing 150 feet away facing the front of the machine, the DBA is 67.

If you are standing 75 feet away facing the side of the machine, the DBA is 65.

Hearing protection is recommended when the unit is in operation.

OPTIONS

> ARE THERE OTHER AVAILABLE OPTIONS?

A dosing pump can be added to unit for chemical applications.



the original

BIG GUN® SPRINKLER



NELSON

WWW.NELSONIRRIGATION.COM

NELSON BIG GUN® SPRINKLERS

The Leader in Quality, Performance & Support



In the field of large-volume sprinklers, Nelson Big Guns® are recognized the world over as the leader in quality, performance and technical support. They are engineered and precision manufactured for heavy-duty reliability and long wear life. Every Nelson Big Gun® is subjected to the toughest inspection testing and quality control standards in the industry — including individual water testing of every gun at the factory.



Durable and reliable with
engineered simplicity.

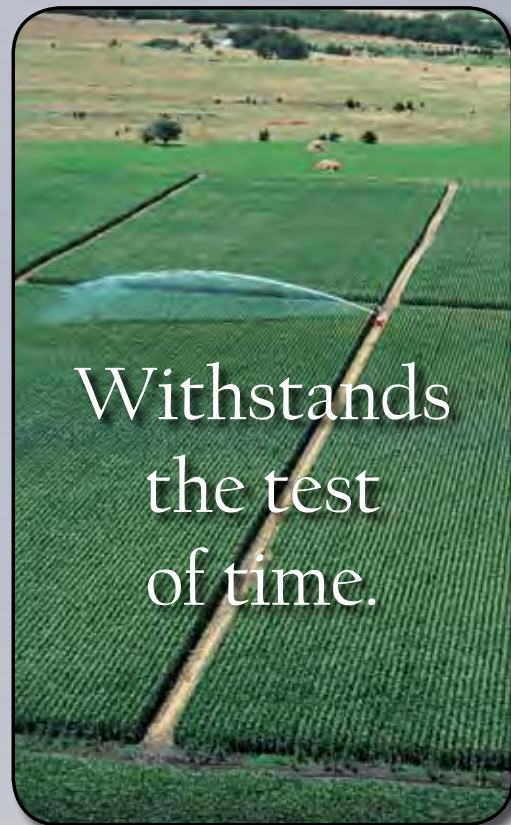


The preferred choice for tough applications.

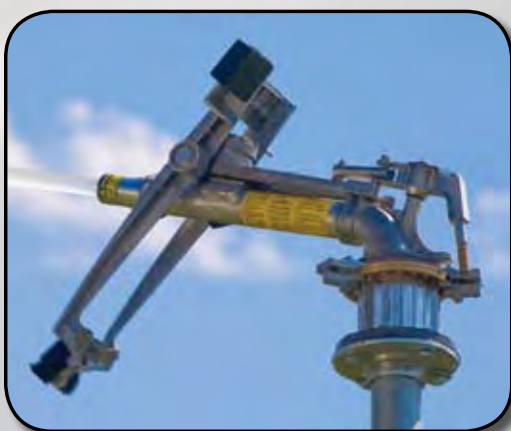


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The Big Gun® Family



The only gun for hour after hour,
year after year operation.



SET IT AND FORGET IT. A simple, positive, reliable adjustment allows for setting the arc to within 1 degree, without overriding the stops. The setting will not change over time, a concept proven with years in the field.

WORKS RIGHT OUT OF THE BOX. Nelson pioneered the concept of a slow, steady and uniform forward and reverse drive action. The drive vane automatically compensates through the full range of nozzle sizes and pressures.



APPLICATIONS

- Pivot End Gun Irrigation
- Traveler Irrigation
- Solid Set Irrigation
 - Corn, Sugar Cane, Pineapple, Pastures, etc.
- Environmental Applications
 - Feedlot Dust Suppression & Cooling
 - Wastewater Applications
 - Mining Dust Suppression
- Sports Field Applications
 - Turf Irrigation
 - Synthetic Turf Cooling & Conditioning



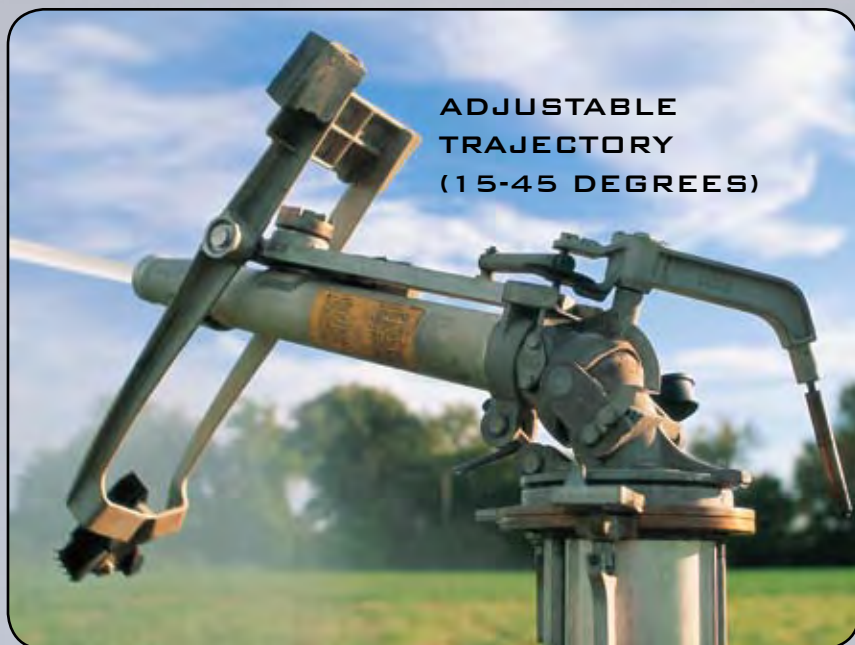
43° BIG GUN
FOR DUST
SUPPRESSION



OPTIONS

- Adjustable Trajectory
- 800 Series Valve/Big Gun® Combination
- Nozzle Valve
- Quick Coupling Valve
- Special Coatings
- Add-on Kits: Secondary Nozzle, Wedge and Counterbalance

(See Big Gun® Add-on Kits literature for details.)



**ADJUSTABLE
TRAJECTORY
(15-45 DEGREES)**



**ANODIZED
& POWDER
COATED
BIG GUN**



NOZZLE VALVE



**WEDGE INSERT TO
MODIFY TRAJECTORY**



COUNTERBALANCE KIT



**QUICK
COUPLING
VALVE FOR
PORTABLE 75 &
100 SERIES BIG
GUN SPRINKLERS**



**800P END GUN
CONTROL VALVE***

*No electric solenoid required
for Big Gun® control when
used with a booster pump

HEAVY DUTY — PRECISION

THE BIG GUN® NAME has a world-wide reputation for quality, performance and support in a number of heavy-duty agricultural and industrial applications.

GREATEST RANGE OF OPTIONS. Full & part-circle sprinklers available in a variety of trajectory, nozzle & coating options.

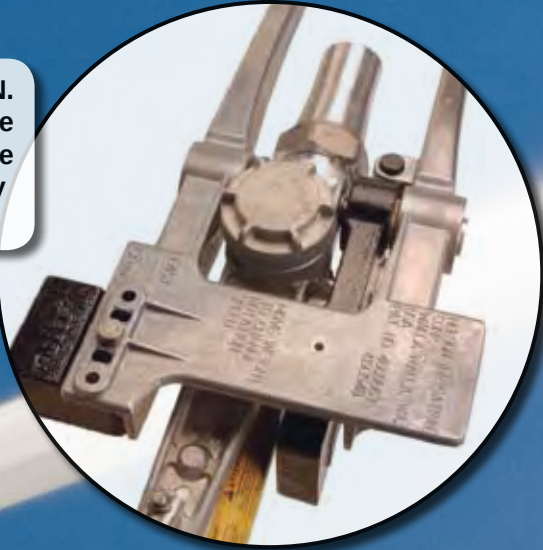


HAND ADJUSTABLE STOPS for Precise Arc Control.

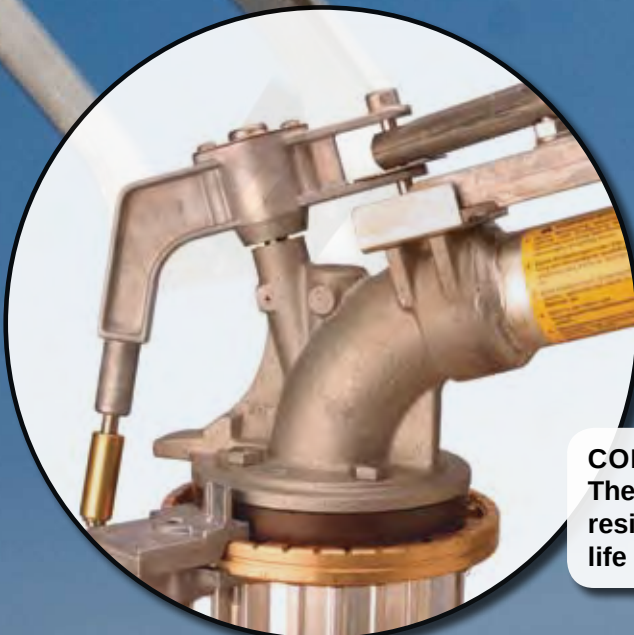
TWIN BALL BEARING IN LOWER BEARING UNIT. Gun has a total of 9 ball bearings — all sealed and lifetime lubricated for long wear life and reliability.

SION MANUFACTURED

EXCELLENT DRIVE ACTION.
The SR Series has the same slow forward and reverse speeds, increasing stability and improving uniformity.

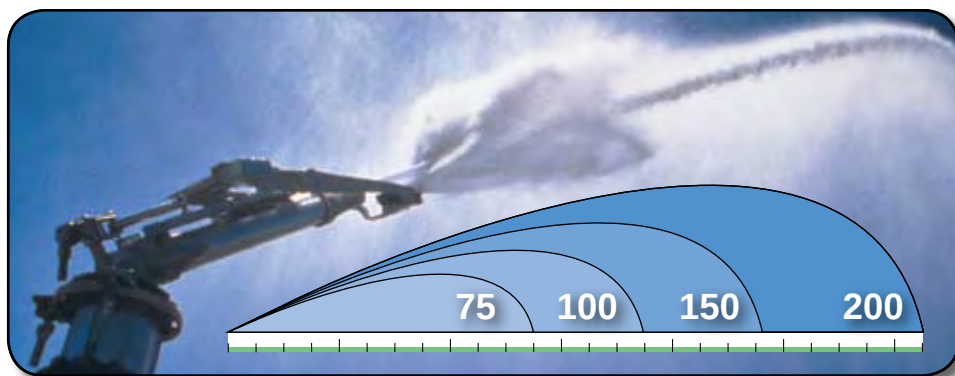


PATENTED PRESSURE AND FLOW COMPENSATING DRIVE SPOON eliminates need for adjustments throughout the full range of nozzle sizes and pressures.



CONSISTENT BRAKE LOAD.
The brake provides a consistent resistance to rotation over the life of the gun.

BIG GUN® OPTIONS AVAILABLE



TO ORDER BIG GUNS® SPECIFY THE FOLLOWING:

Model No., Trajectory, Connection Size & Type, Nozzle Size & Type, Optional Coatings (Anodized or Anodized and Powder Coated) NOTE: Extended lead time may be necessary for large quantities of anodized or anodized and powder coated products.

Specification Example:
SR100 (24°), 2" FNPT, 100T-0.8"

	75 SERIES		100 SERIES			150 SERIES			200 SERIES	
PERFORMANCE	30-160 GPM (6.8-36.3 M ³ /H)  25-80 PSI (1.75-6 Kg/cm ²)		50-300 GPM (10-70 M ³ /H)  40-110 PSI (3.5-8 Kg/cm ²)			100-630 GPM (23-150 M ³ /H)  50-120 PSI (3.5-9 Kg/cm ²)			250-1200 GPM (55-275 M ³ /H)  60-130 PSI (4-9 Kg/cm ²)	
MODEL & TRAJECTORY	Full Circle F75		Full Circle F100	Part Circle SR100	Part Circle SRA100	Full Circle F150	Part Circle SR150	Part Circle SRA150	Full Circle F200	Part Circle SR200
	21°, 24°		18°, 21°, 24°, 43°		15-45° Adjustable	21°, 24°	21°, 24°, 27°, 43°	15-45° Adjustable	21°, 24°, 27°	
NOZZLE OPTIONS	TAPER RING		TAPER RING			TAPER RING			TAPER RING	
	RING		RING			RING			RING	
	0.4-0.8" (10.2-20.3 mm)		0.5-1.0" (12.7-25.4 mm)			0.7-1.4" (17.8-35.6 mm)			1.05-1.9" (26.7-48.3 mm)	
	Not Available		100T (Specify Size)			150T (Specify Size)			200T (Specify Size)	
	TR75 (Specify Size)		100TR (Specify Size)		NA for SRNV	150TR (Specify Size)			Not Available	
	Not Available		100R (Includes Set of Rings)		NA for SRNV	150R (Includes Set of Rings)			200R (Includes Set of Rings)	
SPECIAL OPTIONS	Not Available		Anodized & Powder Coated, Vaneless Range Tube*			Anodized & Powder Coated, Stainless Steel (SRA150 N/A), Vaneless Range Tube			Anodized & Powder Coated	
ADD-ON KITS	HD Lower Bearing, 12° Wedge Kit, Counterbalance Kit, Stream Straightener Vane		Low-Pressure Drive Vane Kit, Counterbalance Kit, Secondary Nozzle Kit, 12° Wedge Kit, Stream Straightener Vane			Counterbalance Kit, Secondary Nozzle Kit, Stream Straightener Vane			Secondary Nozzle Kit (standard), 12° Wedge Kit (SR200 only)	
MOUNTING DETAILS	Fits QC** & 2" 800 Series Valve		Fits QC** & 2" 800 Series Valve (QC NA for SRNV100)			Substantial thrust on riser, use 3" valve minimum			Substantial thrust on riser, use 4" valve minimum	
CONNECTION OPTIONS	1 1/2" or 2" FNPT or FBSP ANSI/DIN Nelson or Euro Flange		2" FNPT or FBSP, 2 1/2" FNPT ANSI/DIN, Nelson or Euro Flange		2" FNPT or FBSP for SRNV	Nelson, Euro or ANSI/DIN Flange Also, Nelson Flange to Female Adapters			Nelson, Euro or ANSI/DIN Flange Also, Nelson Flange to Female Adapters	

*Vaneless Range Tube option is for wastewater applications containing hair, straw, etc.

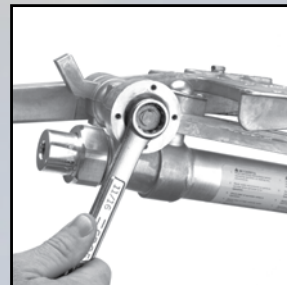
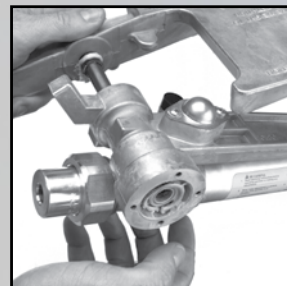
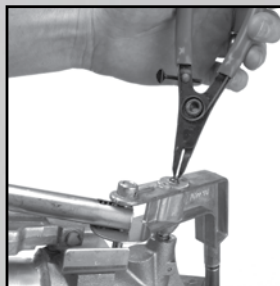
** The "Quick Coupling Valve" inlet is available in both 2" and 3" FNPT and FBSP for connection to the piping system. The "Quick Coupling Key" outlet is available in 2" FNPT, 2" FBSP, and Nelson Flange Connection for connection to the Big Gun.

BIG GUN® FLANGE DETAILS

	75 & 100 SERIES	150 SERIES	200 SERIES
NELSON FLANGE	5/16-18 UNC 2B Threaded Through 2.3" (59mm) 4.0" (102mm) 4.6" (117mm) Use 5/16-18 Bolts Connects to 2" Nelson Flange Bolt Pattern	.406" (10.3mm) Hole Drilled Through 3.2" (81mm) 5.75" (146mm) 6.5" (165mm) Use 3/8-16 Bolts & Nuts or M10 Bolts & Nuts Connects to 3" Nelson Flange Bolt Pattern	3/8-16 UNC Thread .75" (19mm) Deep 4.35" (111mm) 5.75" (146mm) 7.6" (193mm) Use 3/8-16 Bolts & Nuts Connects to 4" Nelson Flange Bolt Pattern (F200 has same bolt pattern as SR150.)
ANSI/DIN COMPATIBLE FLANGE	1/2-13 UNC 2B Threaded Through 2.32" (59mm) 4.62" (117mm) 5.72" (145mm) Use 1/2-13 Bolts Connects to 2" ANSI or 50mm DIN Flanges	1/2-13 UNC 2B Threaded Through 3.2" (81mm) 5.88" (149mm) 6.9" (175mm) Use 1/2-13 Bolts Connects to 3" ANSI or 80mm DIN Flanges	1/2-13 UNC 2B Threaded Through 4.35" (111mm) 7.74" (197mm) 8.9" (226mm) Use 1/2-13 Bolts Connects to 4" ANSI or 100mm DIN Flanges
EURO FLANGE	9.1mm Hole Drilled Through 56mm 130mm 150mm Use M8 Bolts & Nuts Connects to European Traveler Flange	M8 x 1.25 - 6H Threaded Through 81mm 130mm 165mm Use M8 x 1.25 Bolts Connects to European Traveler Flange	M8 x 1.25 - 6H Thread .75" (19mm) Deep 111mm 130mm 193mm Use M8 x 1.25 Bolts Connects to European Traveler Flange

Contact the factory or go to www.nelsonirrigation.com for Parts Lists, Operation & Maintenance Guides, Repair Kits, Dimensional Drawings, Add-on Kit literature & Thrust Force information.

Nelson Big Guns
are easy to repair
with readily
available parts.



BIG GUN® PERFORMANCE (U.S. UNITS)

Flow and diameter (feet) information at various pressures with different nozzle sizes. (See information at bottom of page 11.)

75 TAPER RING NOZZLE — 24° TRAJECTORY

PSI	0.4"		0.45"		0.5"		0.55"		0.6"		0.65"		0.7"		0.75"		0.8"	
	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.
25*	—	—	—	—	—	—	42	146	50	155	59	161	69	167	80	174	91	182
30*	—	—	—	—	37	158	45	158	55	165	64	172	75	182	87	187	99	192
35	—	—	32	154	40	164	49	172	59	178	69	191	81	196	93	202	106	208
40	27	149	35	160	43	171	52	180	63	190	74	198	87	204	98	213	112	221
45	29	155	37	167	46	180	56	189	67	198	79	206	91	214	104	223	118	230
50	30	161	39	174	48	186	59	195	70	203	83	212	95	220	109	230	123	237
55	32	165	41	179	50	193	62	203	74	213	87	221	100	230	115	239	130	247
60	33	169	42	184	53	198	64	208	77	220	91	228	104	237	120	245	136	254
65	35	172	44	189	55	205	67	216	80	227	95	237	109	247	125	254	142	263
70	36	175	45	194	57	210	69	221	83	232	98	243	113	254	129	260	147	270
75	37	179	47	201	59	217	72	228	86	239	101	250	117	261	134	268	153	277
80	39	182	49	207	61	222	74	234	89	244	105	256	121	266	138	274	158	283

*Operating at pressures above 30 PSI provides better performance.

100 TAPER BORE NOZZLE — 24° TRAJECTORY

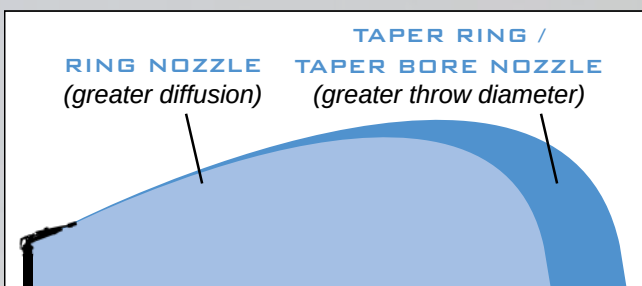
PSI	0.5"		0.55"		0.6"		0.65"		0.7"		0.75"		0.8"		0.85"		0.9"		1.0"	
	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.
40	47	191	57	202	66	213	78	222	91	230	103	240	118	250	134	256	152	262	—	—
50	50	205	64	215	74	225	87	235	100	245	115	256	130	265	150	273	165	280	204	300
60	55	215	69	227	81	240	96	250	110	260	126	270	143	280	164	288	182	295	224	316
70	60	225	75	238	88	250	103	263	120	275	136	283	155	295	177	302	197	310	243	338
80	64	235	79	248	94	260	110	273	128	285	146	295	165	305	189	314	210	325	258	354
90	68	245	83	258	100	270	117	283	135	295	155	306	175	315	201	326	223	335	274	362
100	72	255	87	268	106	280	123	293	143	305	163	316	185	325	212	336	235	345	289	372
110	76	265	92	278	111	290	129	303	150	315	171	324	195	335	222	344	247	355	304	380

150 TAPER BORE NOZZLE — 24° TRAJECTORY

PSI	0.7"		0.8"		0.9"		1.0"		1.1"		1.2"		1.3"		1.4"	
	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.
50	100	250	130	270	165	290	205	310	255	330	300	345	350	360	408	373
60	110	265	143	285	182	305	225	325	275	345	330	365	385	380	446	396
70	120	280	155	300	197	320	245	340	295	360	355	380	415	395	483	412
80	128	290	165	310	210	335	260	355	315	375	380	395	445	410	516	427
90	135	300	175	320	223	345	275	365	335	390	405	410	475	425	547	442
100	143	310	185	330	235	355	290	375	355	400	425	420	500	440	577	458
110	150	320	195	340	247	365	305	385	370	410	445	430	525	450	605	471
120	157	330	204	350	258	375	320	395	385	420	465	440	545	460	632	481

200 TAPER BORE NOZZLE — 27° TRAJECTORY

PSI	1.05"		1.1"		1.2"		1.3"		1.4"		1.5"		1.6"		1.75"		1.9"	
	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.	GPM	DIAM. FT.
60	250	345	285	355	330	375	385	390	445	410	515	430	585	445	695	470	825	495
70	270	360	310	380	355	395	415	410	480	430	555	450	630	465	755	495	890	515
80	290	375	330	395	380	410	445	430	515	450	590	470	675	485	805	515	950	535
90	310	390	350	410	405	425	475	445	545	465	625	485	715	505	855	535	1005	555
100	325	400	370	420	425	440	500	460	575	480	660	500	755	520	900	550	1060	575
110	340	410	390	430	445	450	525	470	605	495	695	515	790	535	945	565	1110	590
120	355	420	405	440	465	460	545	480	630	505	725	530	825	550	985	580	1160	605
130	370	425	425	445	485	465	565	485	655	515	755	540	860	560	1025	590	1210	620



See opposite page for nozzle descriptions.



BIG GUN® PERFORMANCE (METRIC)

Flow and diameter (meters) information at various pressures with different nozzle sizes. (See information at bottom of page.)

75 TAPER RING NOZZLE TR75 — 24° TRAJECTORY

Kg/cm ²	10.2 mm			11.4 mm			12.7 mm			14.0 mm			15.2 mm			16.5 mm			17.8 mm			19.1 mm			20.3 mm		
	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M
1.75*	—	—	—	—	—	—	—	—	—	2.64	9.5	44	3.17	11.4	48	3.72	13.4	49	4.30	15.5	51	4.91	17.7	54	5.59	20.1	56
2.00*	—	—	—	—	—	—	2.33	8.4	48	2.82	10.2	48	3.39	12.2	51	3.98	14.3	52	4.59	16.5	56	5.25	18.9	58	5.97	21.5	59
2.50	—	—	—	2.11	7.6	47	2.61	9.4	50	3.16	11.4	53	3.79	13.6	55	4.45	16.0	58	5.14	18.5	60	5.87	21.1	62	6.68	24.0	64
3.00	1.83	6.6	47	2.32	8.3	50	2.86	10.3	53	3.46	12.4	57	4.15	14.9	59	4.88	17.6	61	5.63	20.3	63	6.43	23.1	66	7.32	26.3	69
3.50	1.98	7.1	49	2.50	9.0	52	3.09	11.1	57	3.74	13.4	60	4.48	16.1	62	5.27	19.0	64	6.08	21.9	67	6.95	25.0	70	7.90	28.4	73
4.00	2.11	7.6	50	2.67	9.6	54	3.30	11.9	59	3.99	14.4	62	4.79	17.2	65	5.63	20.3	67	6.50	23.4	71	7.43	26.7	73	8.45	30.4	76
4.50	2.24	8.1	52	2.84	10.2	57	3.50	12.6	62	4.24	15.2	66	5.08	18.3	68	5.97	21.5	71	6.89	24.8	75	7.88	28.4	78	8.96	32.3	80
5.00	2.36	8.5	53	2.99	10.8	60	3.69	13.3	64	4.46	16.1	68	5.35	19.3	70	6.30	22.7	74	7.26	26.1	78	8.30	29.9	80	9.45	34.0	84
5.50	2.48	8.9	55	3.13	11.3	62	3.87	13.9	66	4.68	16.9	70	5.61	20.2	73	6.60	23.8	77	7.62	27.4	81	8.71	31.3	83	9.90	35.7	86
6.00	2.59	9.3	56	3.27	11.8	63	4.04	14.6	68	4.89	17.6	72	5.86	21.1	74	6.90	24.8	79	7.96	28.6	84	9.09	32.7	85	10.3	37.2	87

*Operating at pressures above 2 Kg/cm² provides better performance.

100 TAPER BORE NOZZLE — 24° TRAJECTORY

Kg/cm ²	12.7 mm			14.0 mm			15.2 mm			16.5 mm			17.8 mm			19.1 mm			20.3 mm			21.6 mm			22.9 mm			25.4 mm		
	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M
3.0	3.00	10.8	59.5	3.73	13.4	62.6	4.33	15.6	66.1	5.09	18.3	66.8	5.84	21.0	71.4	6.71	24.1	74.5	7.64	27.5	77.5	8.74	31.5	79.5	9.67	34.8	81.4	11.9	42.8	88.1
4.0	3.40	12.2	64.3	4.25	15.3	67.8	5.00	18.0	71.8	5.86	21.1	74.8	6.82	24.6	77.8	7.73	27.8	81.0	8.66	31.2	82.8	10.1	36.2	86.4	11.2	40.4	88.6	13.8	49.5	94.8
5.0	3.79	13.6	69.0	4.72	17.0	72.7	5.59	20.1	76.4	6.56	23.6	80.2	7.62	27.5	84.4	8.66	31.2	86.7	9.91	34.9	90.4	11.3	40.5	92.5	12.5	45.2	94.7	15.5	55.6	103
6.0	4.17	15.0	73.4	5.14	18.5	77.3	6.12	22.1	80.7	7.19	25.9	85.0	8.35	30.1	88.7	9.51	34.3	91.8	10.9	38.2	94.7	12.4	44.5	97.7	13.7	49.5	101	16.8	60.5	109
7.0	4.53	16.3	77.6	5.52	19.9	81.6	6.61	23.8	85.0	7.75	27.9	89.3	9.02	32.5	93.0	10.3	37.0	96.1	11.7	41.3	99.0	13.3	48.0	102.2	14.8	53.5	105	18.2	65.5	113
8.0	4.89	17.6	81.7	5.84	21.0	85.7	7.07	25.5	89.3	8.25	29.7	93.1	9.64	34.8	97.3	11.0	39.4	99.7	12.5	44.1	103	14.2	51.2	105.8	15.9	57.2	109	19.5	70.2	116

150 TAPER BORE NOZZLE — 24° TRAJECTORY

	17.8 mm			20.3 mm			22.9 mm			25.4 mm			27.9 mm			30.5 mm			33.0 mm			35.6 mm		
Kg/cm ²	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M
3.5	6.39	23.0	76.0	8.29	29.8	82.0	10.5	37.8	88.0	13.0	46.9	95.0	15.9	57.1	101	19.0	68.3	105	22.3	80.1	110	25.8	92.9	114
4.0	6.83	24.6	79.6	8.86	31.9	85.6	11.2	40.4	91.6	13.9	50.1	97.8	16.9	61.0	104	20.3	73.0	109	23.8	85.7	114	27.4	98.6	118
5.0	7.63	27.5	85.4	9.91	35.7	91.6	12.6	45.2	98.6	15.6	56.0	105	18.9	68.2	111	22.7	81.7	117	26.6	95.8	121	30.8	111	126
6.0	8.36	30.1	89.7	10.9	39.1	96.7	13.8	49.5	104	17.0	61.3	110	20.8	74.7	117	24.9	89.5	123	29.1	105	128	33.6	121	133
7.0	9.03	32.5	95.0	11.7	42.2	101	14.9	53.5	108	18.4	66.3	114	22.4	80.7	122	26.8	96.6	128	31.5	113	134	36.4	131	139
8.0	9.66	34.8	99.3	12.5	45.1	105	15.9	57.2	112	19.7	70.8	118	24.0	86.3	126	28.7	103	132	33.7	121	138	38.9	140	145
9.0	10.2	36.9	104	13.3	47.9	110	16.8	60.6	117	20.9	75.1	123	25.4	91.5	131	30.4	110	137	35.7	129	143	41.1	148	149

200 TAPER BORE NOZZLE — 27° TRAJECTORY

Kg/cm ²	26.7 mm			27.9 mm			30.5 mm			33.0 mm			35.6 mm			38.1 mm			40.6 mm			44.5 mm			48.3 mm		
	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M	L/S	M ³ /H	DIAM. M
4.0	15.5	55.7	104	17.8	63.9	106	20.3	73.1	112	23.8	85.8	117	27.5	98.9	123	32.2	116	129	36.1	130	134	42.9	154	141	50.7	183	149
5.0	17.3	62.3	111	19.9	71.5	117	22.7	81.7	121	26.7	96.0	126	30.7	111	132	36.0	130	138	40.3	145	143	48.0	173	152	56.7	204	158
6.0	19.0	68.2	115	21.8	78.3	121	24.9	89.5	126	29.2	105	132	33.7	121	138	39.4	142	144	44.2	159	149	52.6	189	158	62.1	224	164
7.0	20.5	73.7	122	23.5	84.6	128	26.9	96.7	134	31.5	114	140	36.3	131	146	42.6	153	152	47.7	172	159	56.8	204	168	67.1	241	175
8.0	21.9	78.8	126	25.1	90.4	132	28.7	103	138	33.7	121	144	38.9	140	152	45.5	164	159	51.0	184	165	60.7	218	174	71.7	258	182
9.0	23.2	83.6	130	26.6	95.9	136	30.4	110	142	35.8	129	148	41.2	148	157	48.3	174	164	54.1	195	170	64.4	232	180	76.0	274	188

Diameters are based on a 24° trajectory for the 75, 100 and 150 Series and a 27° trajectory for the 200 Series. The lower trajectory angles result in better wind fighting ability, but reduced throw distances. Throw reduction depends upon nozzle flow rate. In general, the throw distance is reduced approximately 3% with each 3° drop in trajectory angle. Use of the wedge insert to modify trajectory will affect distance. Big Gun® performance data has been obtained under ideal test conditions and may be adversely affected by wind, poor hydraulic entrance conditions or other factors. Test riser height of 3 feet (0.91 meters) above measurement surface. No representation regarding droplet condition, uniformity, application rate, or suitability for a particular application is made herein.

Additional nozzle options and sizes available. Go to www.nelsonirrigation.com or contact the factory for nozzle performance.

TAPER BORE NOZZLE. Most common nozzle type. Used where the available water flow and pressure are consistent. A nozzle size must be specified when ordering a Big Gun with a Taper Bore Nozzle. *The Nozzle Valve End Gun requires a Taper Bore Nozzle.*

RING NOZZLE SET. The Ring Nozzle Set is an easy and economic way of changing nozzles to match the available water flow and pressure. These are commonly used where the available water flow and pressure are variable and or when the Big Gun is shifted between various water sources with different capacities. The abrupt orifice of the nozzle is less efficient so the radius of throw is less than that achieved with an equivalent diameter Taper Bore nozzle. The abrupt orifice of the Ring Nozzle does break the stream of water up more, which can be an advantage in low pressure applications. The Ring Nozzle comes with a set of rings. *The Ring Nozzle should not be used with the Nozzle Valve End Gun.*

TAPER RING NOZZLE. This nozzle combines the changeability of a Ring Nozzle with some of the efficiency of a Taper Bore Nozzle. When ordering the Taper Ring Nozzle, specify the size as only one Taper Ring comes with the nozzle body and cap. Additional taper ring sizes can be purchased. *The Taper Ring Nozzle should not be used with the Nozzle Valve End Gun.*



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Nelson is proud of its reputation for quality and integrity. We work hard to make our products the best, and we stand behind them with a one-year warranty.

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Tel: +61 7 3715 8555 Fax: +61 7 3715 8666 info@nelsonirrigation.com.au

WARRANTY AND DISCLAIMER: Nelson Big Gun® Sprinklers are warranted for one year from date of original sale to be free of defective materials and workmanship when used within the working specifications for which the products were designed and under normal use and service. The manufacturer assumes no responsibility for installation, removal or unauthorized repair of defective parts. The manufacturer's liability under this warranty is limited solely to replacement or repair of defective parts and the manufacturer will not be liable for any crop or other consequential damages resulting from defects or breach of warranty. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSES AND OF ALL OTHER OBLIGATIONS OR LIABILITIES OF MANUFACTURER. No agent, employee or representative of the manufacturer has authority to waive, alter or add to the provisions of this warranty, nor to make any representations or warranty not contained herein.

This product may be covered by one or more of the following U.S. Patent Nos. D297,453, 3,559,887, 3,744,720, 4,193,548, 4,669,663 and other U.S. Patents pending or corresponding issued or pending foreign patents.

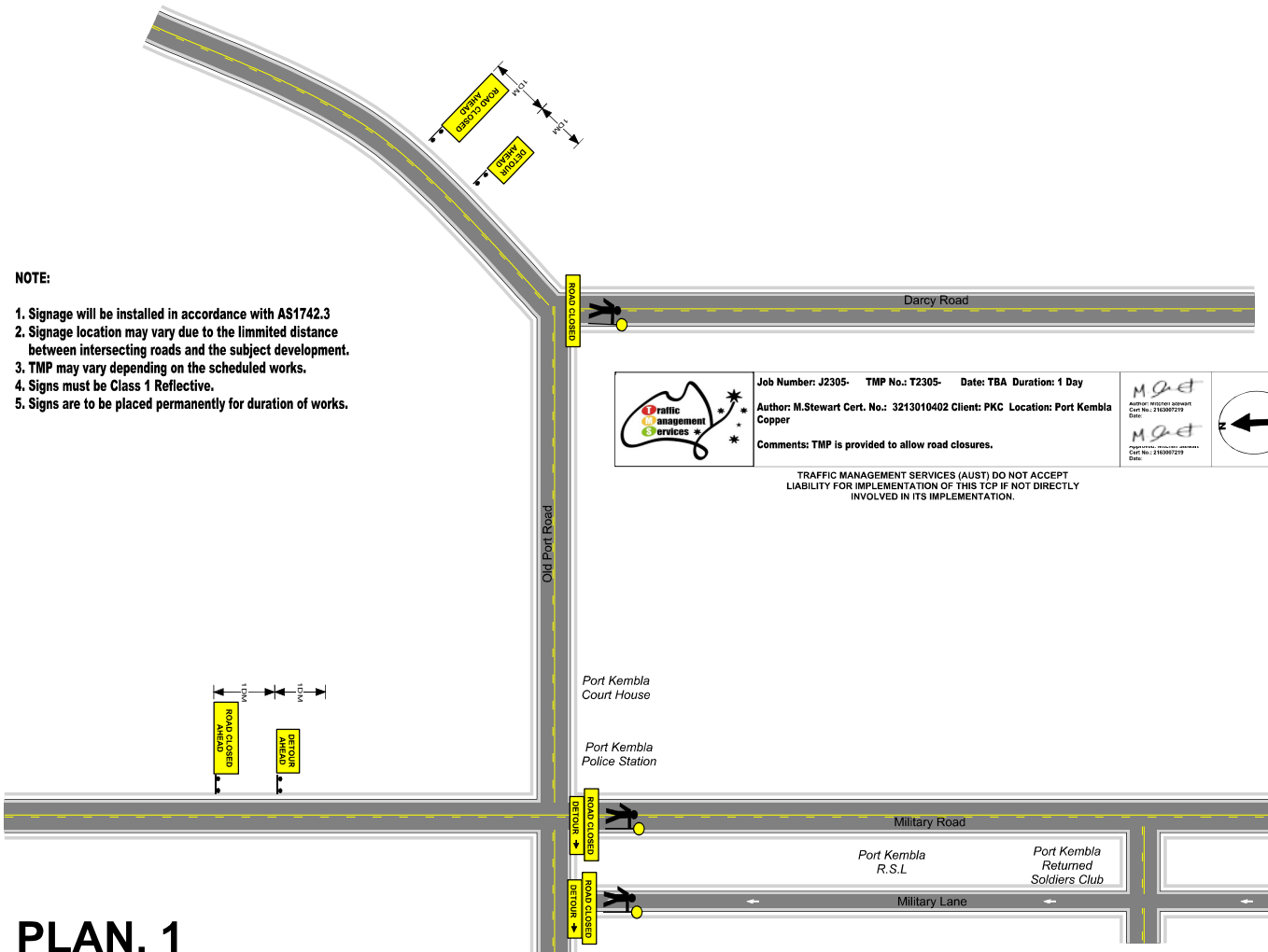


APPENDIX G

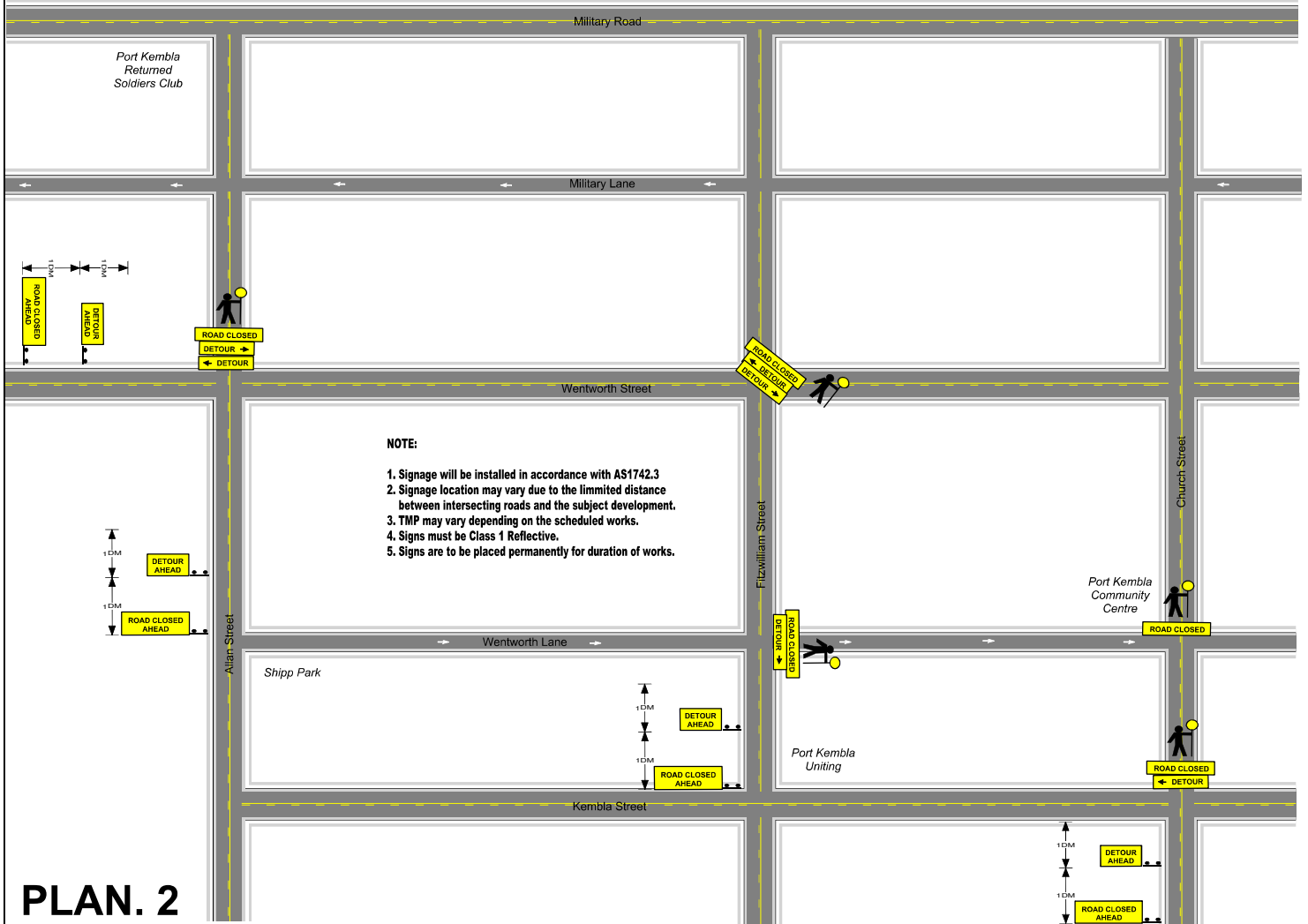
Traffic Management Information

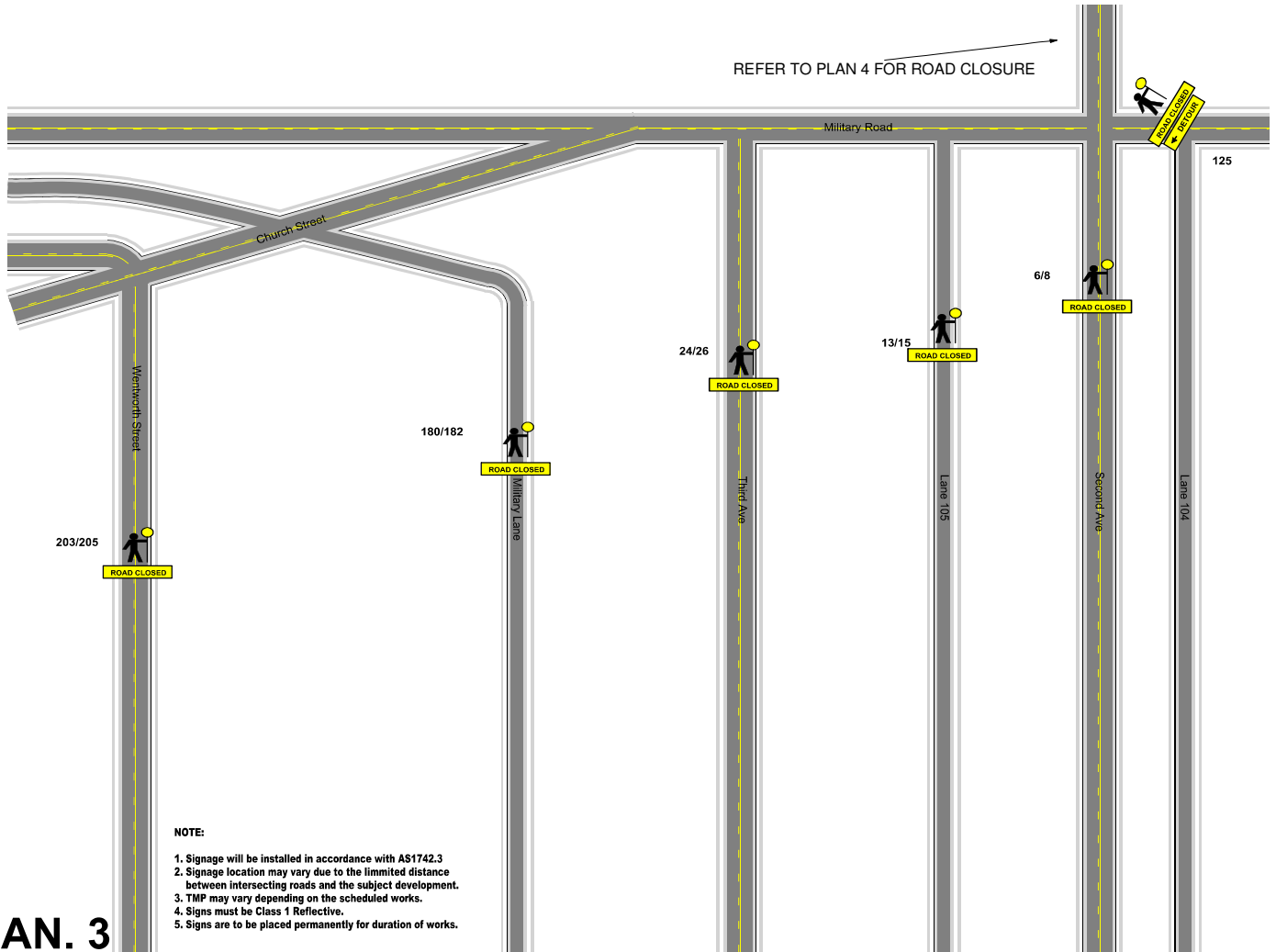
NOTE:

1. Signage will be installed in accordance with AS1742.3
2. Signage location may vary due to the limited distance between intersecting roads and the subject development.
3. TMP may vary depending on the scheduled works.
4. Signs must be Class 1 Reflective.
5. Signs are to be placed permanently for duration of works.

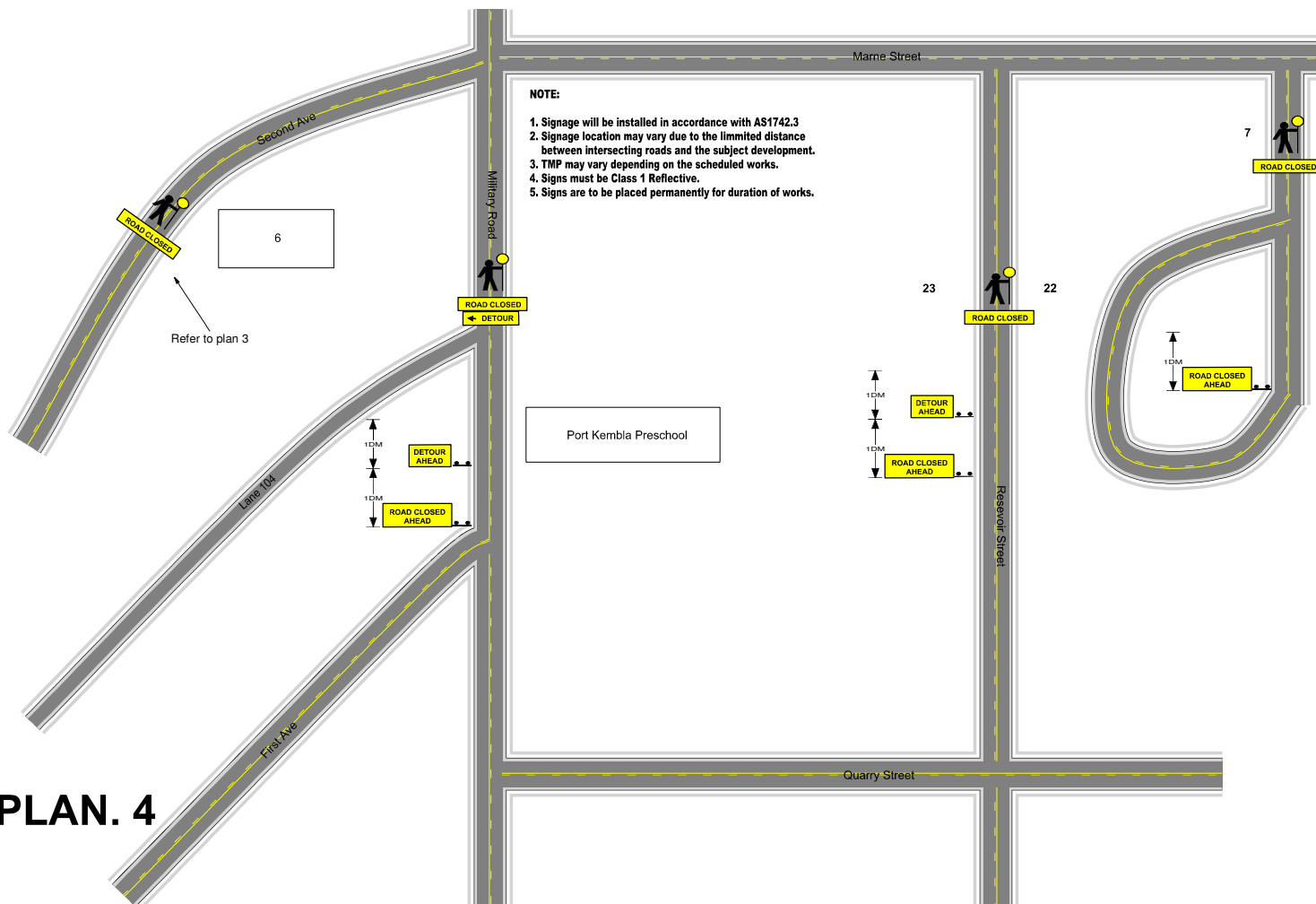


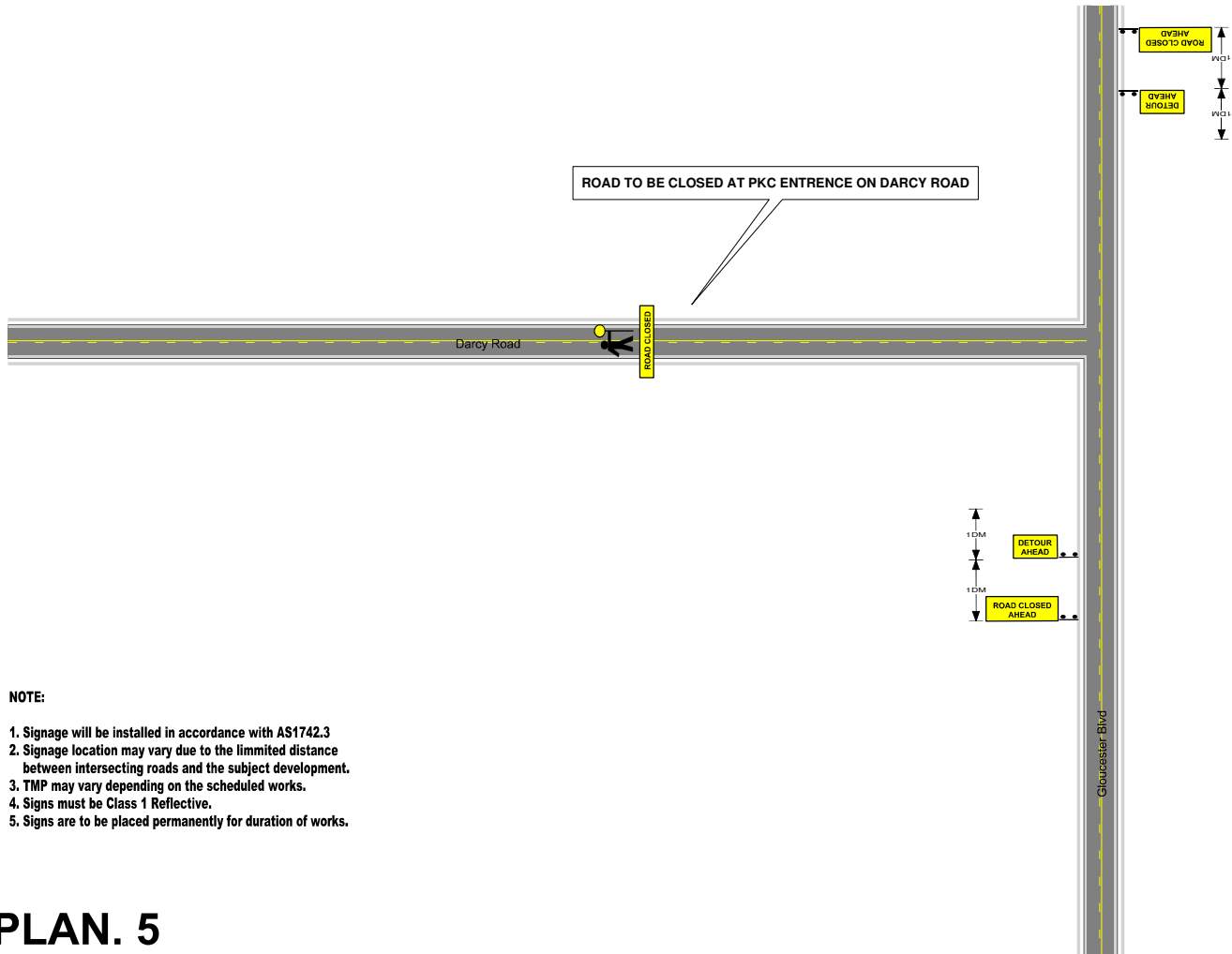
PLAN. 1





PLAN. 3





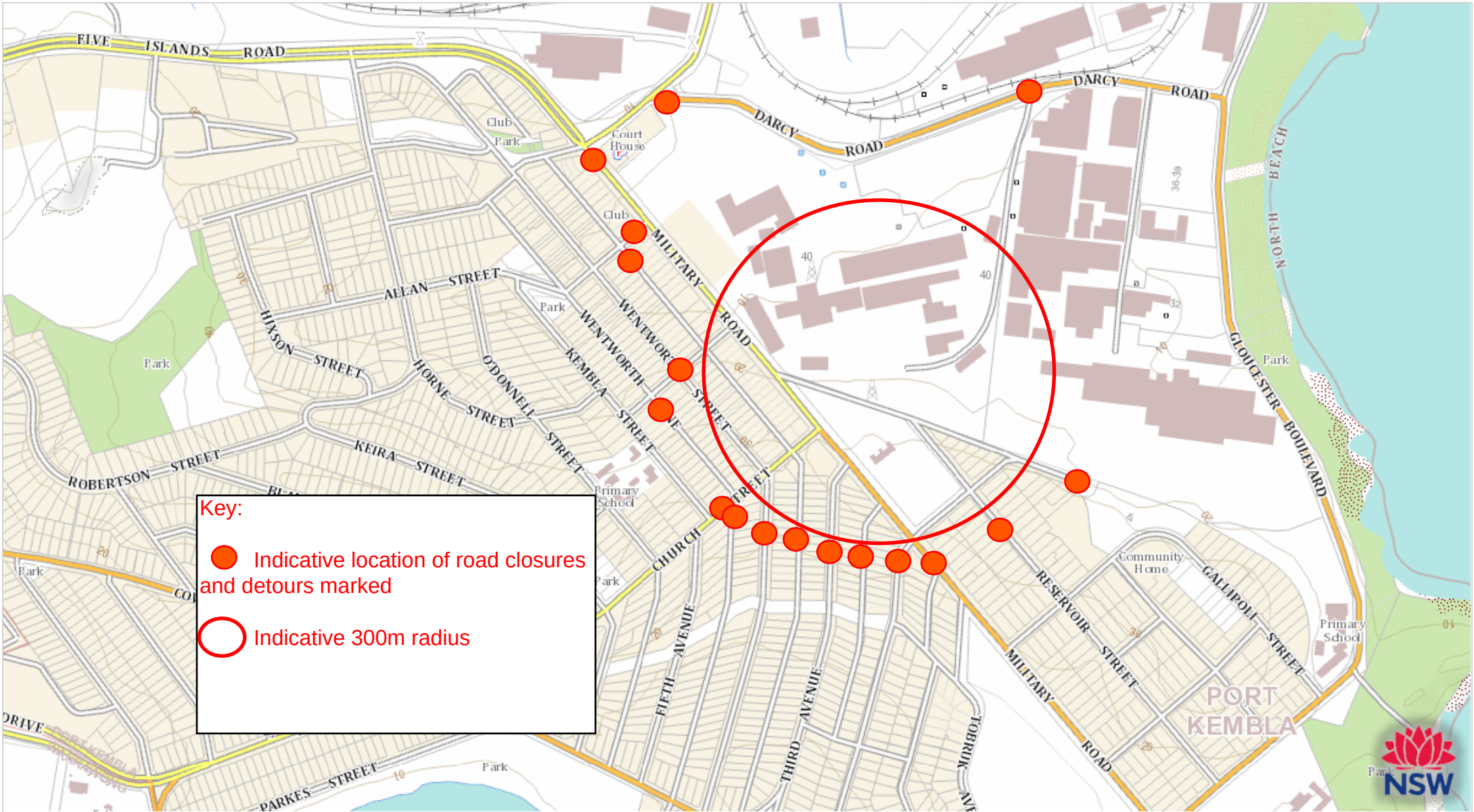
NOTE:

1. Signage will be installed in accordance with AS1742.3
2. Signage location may vary due to the limitted distance between intersecting roads and the subject development.
3. TMP may vary depending on the scheduled works.
4. Signs must be Class 1 Reflective.
5. Signs are to be placed permanently for duration of works.

PLAN. 5

PKC Detour Plan

Traffic Management Plan



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APPENDIX H

Media Strategy



PORT KEMBLA COPPER STACK DEMOLITION

LANGUAGE COMMUNICATIONS STRATEGY



PREPARED BY CATCH COMMUNICATIONS PTY LTD

January 2014

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INTRODUCTION

Formerly a copper refining operation, Port Kembla Copper (PKC) is in the process of readying its site for redevelopment. The removal of a 200 metre high concrete stack on 20 February 2014 is critical to future use of the site for the industrial purposes for which the site is zoned.

During the demolition of the stack a 300 metre Exclusion Zone will be in place as a safety precaution. The Exclusion Zone was developed in consultation with WorkCover NSW and is consistent with the requirements of the relevant Australian Standards for demolition. It is necessary that residents, workers and school students in and near the Exclusion Zone are fully informed of the arrangements for the day of the stack removal, how they can be prepared and what precautions they can take.

Port Kembla has some residents who would be better served by communications in Macedonian, Italian or Greek rather than English alone, which is why this dedicated Language Communications Strategy has been developed.

The location of the stack and the 300 metre Exclusion Zone is shown in the attached figure. The locations of schools within (Port Kembla Preschool) or in close vicinity to the Exclusion Zone (St Patricks Catholic Parish Primary School and Port Kembla Public School) are also shown in this figure.

GOALS

1. To ensure the safe demolition of the stack on the set date with a minimum of disruption to residents and businesses in the 300 metre Exclusion Zone
2. To inform non-English speaking residents of Port Kembla of the planned removal of the stack and arrangements for the day

KEY MESSAGES

Primary

1. The Port Kembla Copper stack is being demolished on 20 February 2014
2. The demolition of the stack and the plans for demolition have been approved by the consent authority (the Department for Planning and Infrastructure)
3. There will be a 300 metre Exclusion Zone around the stack as a safety precaution
4. Homes and businesses within the Exclusion Zone will need to be vacated for a few hours on the morning
5. Information will continue to be circulated in the lead up to and following the demolition
6. We apologise for the inconvenience caused

Secondary

Language

1. The most critical brochures have and will continue to include translations into Macedonian, Greek and Italian
2. Translators can be arranged upon request for anyone in the Exclusion Zone wishing to discuss the stack demolition with PKC

General

1. The stack will fall to the north, in what's known as a "felling" demolition. The fall zone for the stack is shown on the attached figure.
2. The demolition is being carried out by Australia's experts; this will be their 16th stack, so we're in safe hands
3. Clearing of the Port Kembla Copper site has been underway since 2010
4. We're working closely with the Illawarra Emergency Management Committee on all arrangements

Consultation

1. PKC staff will be on site (weekdays only) and available to answer questions until the day of demolition.
2. Ongoing consultation will occur with residents and local businesses up to and following the date of demolition through letter drops, home visits, media releases, community liaison group meetings and via the project website (www.stackinfo.com.au).
3. PKC will continue to liaise with the regulatory stakeholders up to and following demolition. This will include meetings with, and submission of supplementary information to, the Department of Planning and Infrastructure, Environment Protection Authority, Wollongong City Council, NSW Department of Health and WorkCover NSW. PKC has and will continue to consult with the regulatory stakeholders in relation to information provided to the public

Health

1. The demolition will make a noise comparable to a loud thunder clap
2. The stack has been cleaned of industrial traces but any remaining dust disturbed is expected to settle within the boundaries of the PKC site. However, it is possible that in the circumstance of unfavourable wind conditions, dust may move over and settle on the suburb of Port Kembla.
3. PKC is taking precautions to manage and monitor environmental factors including dust, vibration and noise. The locations of these monitors are illustrated in the attached figure.
4. Residents can take their own additional precautions in the lead up to the demolition, which could include the following:
 - a. Staying inside and closing doors and windows
 - b. Removing washing from lines
 - c. Parking cars under cover
 - d. Washing home grown produce consumed after the demolition event
 - e. Disconnecting water tanks.
5. If you are concerned about potential health impacts associated with dust or debris that may leave the site, the following should be contacted.

Agency/Organisation	Name	Phone
Project Team		
Project Manager	Ian Wilson	0419 612 305
Health and Safety Management	Ian Wilson	0419 612 305
Community Liaison Manager	Ian Wilson	0419 612 305
Environmental Management	Graeme Miller	0458 598 671
Regulatory Authorities		
Department of Planning and Infrastructure	Head Office	(02) 9228 6111
EPA	Wollongong Office	(02) 4224 4100
	Environment Line	131 555
Wollongong City Council	General Enquiries	(02) 4227 7111

Exclusion zone businesses and residents

1. We are personally visiting the homes and businesses of everyone in the Exclusion Zone
2. We will send you regular updates in the lead up to the demolition
3. A Reception Centre will be set up at the Port Kembla Leagues Club while the Exclusion Zone is in place
4. We will make arrangements for anyone in the Exclusion Zone with special needs. This will include transport to and from your home to the reception centre or another nominated location within the area. Arrangements will be made for transport during home visits made in the weeks prior to demolition
5. Arrangements will be made for pets to be relocated
6. You do not have to go to the Reception Centre, you can go anywhere outside the Exclusion Zone
7. You will be visited on the morning to be told it's time to depart the Exclusion Zone
8. You can drive out of the Exclusion Zone when it's time to depart and drive back in when the all clear is given
9. You will receive a text message to your nominated mobile number when the all clear is given

Port Kembla whole

1. If you are not visited by a Port Kembla Copper representative it means you can safely stay in your home on the morning
2. Roads will be closed in the Exclusion Zone and Police barricades set up at nearby intersections
3. Some buses will have minor diversions
4. More information is available at www.stackinfo.com.au

STAKEHOLDERS

Residents within the Exclusion Zone who aren't fluent in English

Those living and working within the Exclusion Zone will be the most disrupted. They will be required to leave their premises for several hours on the day of the demolition and they may feel worried or stressed in the lead up to the demolition.

To minimise concern and ensure their needs are met, these locals will be personally visited by PKC representatives, who will check for special needs, language barriers, pets, children and so on.

Translators will be arranged as required for conversations with Exclusion Zone residents.

Port Kembla residents who aren't fluent in English

Residents outside the Exclusion Zone will be less disrupted by the demolition but would be quite startled if they were previously unaware of the demolition when it took place. They may also wish to take some precautions for dust (refer to information provided in above sections).

The PKC Health and Environment brochure has been sent to residents within a 600 metre radius of the stack and includes Macedonian, Italian and Greek translations.

Translated materials are also available in a special section of the www.stackinfo.com.au website.

Field Code C

Local language media

PKC's media release list includes local language media, specifically:

Community Radio Vox FM (Macedonian and Greek programs):
office@voxfm.org.au

Field Code C

Macedonian Radio Hertz 100.7 FM: 4276 3939 Goce

Australian Macedonian Weekly: amw@westnet.com.au

Italian Social Welfare newsletter: coordina1@itsowel.com.au

Greek Radio 2mm (Wollongong 99.3FM): tc@2mm.com.au

TACTICS

Direct mail

Letters have been and will be sent to residents within 600 metres of the stack. Homes and businesses in the Exclusion Zone will receive additional letters.

Media releases and interviews

Regular media releases will be issued to provide updates, reinforce key messages and prevent an information vacuum. Ian Wilson will be PKC's sole spokesperson and will be available for reactive and proactive interviews.

Personal visits

Homes and businesses in the Exclusion Zone will be personally visited. Subsequent visits may be required for residents with special needs or who require the assistance of a translator.

Freecall number

PKC will operate a freecall number, 1800 688 587 to respond to additional public enquiries.

Event website

A dedicated event website (www.stackinfo.com.au) houses a brief overview, FAQs, media releases, the freecall number and additional information as required, including documents in language.

MATRIX

Week beginning	Tactic	Message
	21-Oct	Direct mail Personal visits Information Centre
		Health, environment and safety preparedness brochure New Exclusion Zone survey and offer of dilapidation survey Continues to operate
	28-Oct	Information Centre Direct mail
		Continues to operate Letter to missed new Exclusion Zone residents to complete online or phone survey
	4-Nov	Media Information Centre
		[Respond to enquiries] Continues to operate
	Date announced	Media release Personal visits Direct mail Website Information Centre
		Date announced Date announced, confirm details with Exclusion Zone residents Date and critical timings on a flyer for the home fridge Updated with details Q&A Continues to operate
	Week before demolition	Media release Information Centre
		Recap arrangements Continues to operate
Week of demolition	Direct mail	Flyer to Exclusion Zone the day before demolition, what will happen when
	Media release	Restrictions of viewing locations, recommendations
	Information Centre	Continues to operate
	Media interviews	On the day weather updates with broadcast media, dust management recommendations

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STACK DEMOLITION MANAGEMENT PLAN

PORT KEMBLA COPPER PTY LTD

NOISE AND DUST MONITORING LOCATIONS

- ### LEGEND
- Noise Monitoring Location
 - Air Quality Sample Location
 - Dust Deposition Sample Location
 - Possible Attended Noise and Dust Monitoring Location
 - Stack
 - Drop Zone
 - Exclusion Zone

COPYRIGHT

Aerial Photography Copyright NearMap Pty Ltd. Image Date 05.07.2013, Sourced 16.08.2013.

Street data sourced from Mapinfo StreetPro.

0 25 50 100 150 200 metres

SCALE (at A3) 1:6,000

DATUM GDA 94, PROJECTION MGA Zone 56

PROJECT: 087663019
DATE: 29 JAN 2014
DRAWN: KB
CHECKED: GM





APPENDIX I

Documentation on TENORMS

EPA Radioactivity Testing - PKC smelter stack

The EPA tested bricks taken from the PKC smelter stack to determine whether elevated levels of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORMs) were present in the inner wall of the inner stack that was exposed to previous smelting emissions.

No elevated levels of radioactivity were detected in the testing.

Brick samples previously collected by the EPA for metals and asbestos testing were used for the purposes of this test and these were compared with surfaces not exposed and background from normal bricks and concrete materials unrelated to the site.

All samples were tested in December 2013 for gross alpha, beta and gamma radiation by the EPA. As there was no discernible difference between bricks from within the stack and the natural level in common building materials, the EPA concluded there was no basis for further EPA investigation of these materials from within the stack .

In relation to any waste materials generated on the site, the EPA requires all wastes to be assessed, classified and managed in accordance with the EPA *Waste Classification Guidelines*.



APPENDIX J

Limitations

LIMITATIONS

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