Port Kembla Copper Site Demolition Project: Preparation for Future Use

Environmental Assessment

Prepared by Port Kembla Copper Pty Ltd

For the NSW Department of Planning

Submitted as final on 8 April 2009

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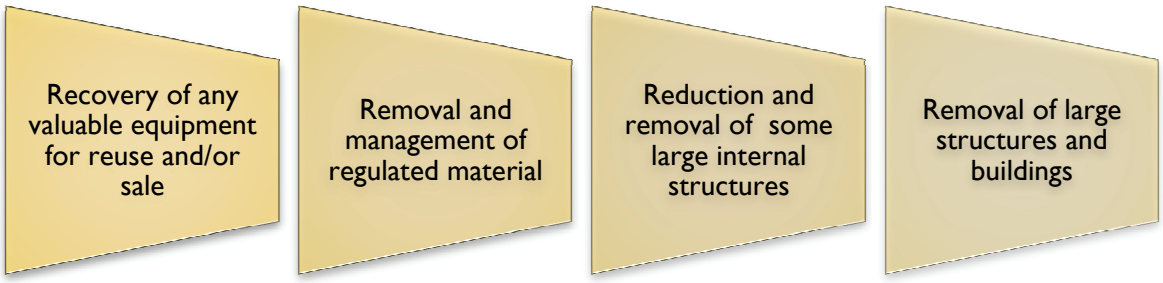
Executive Summary

Port Kembla Copper Pty Ltd (PKC) has applied to the NSW Department of Planning to demolish its former copper smelter and refinery, as a Major Project under Part 3A of the *Environmental Planning and Assessment Act 1979*.

The site ceased use as a copper smelter and refinery in 2003, during which time it has been managed under care and maintenance. Significant remediation has taken place during this time.

The project will take involve the following key steps.



The project is expected to take place from the second quarter of 2009 to mid-2010, assuming that the project will be approved in early 2009.

Alternatives to the project have been considered, and demolition is the only feasible option for facilitating reuse of the site for employment-generating development.

The project is consistent with the zoning of the site, and local and state government strategies.

The environmental risks of the project have been assessed, and all can be managed effectively. The main environmental aspects considered, and an outline of their proposed management, are as follows.

- Water management
- Biodiversity
- Air quality and odour
- Noise and blasting
- Contaminated soil and water management
- Hazard and safety
- Waste
- Traffic
- Heritage

PKC has undertaken extensive consultation regarding the project, and has considered the input from the community, local businesses, local government and state government agencies in this Environmental Assessment.

PKC has prepared a draft Statement of Commitments which will ensure the project is managed appropriately.

The proposed demolition of the PKC site is justified on economic, social and environmental grounds.

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Statement of Completeness

This Environmental Assessment (EA) has been prepared in accordance with the requirements provided by the NSW Department of Planning's Director-General on 22 October 2008. The required areas of study are listed in the table below, and referenced to the respective areas in which they are covered in this EA.

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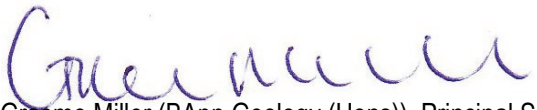
Statement by Authors

The authors of this Environmental Assessment certify that it has been prepared in good faith and based on information either accurately collected, or provided by suitably qualified expert consultants or the proponent directly, and the authors have no reason to doubt its veracity. The Environmental Assessment is not false or misleading.



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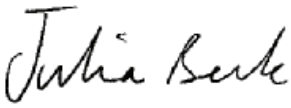

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1 Existing Development

1.1 Site History

1.1.1 General

Copper smelting has been carried out at the site at Port Kembla in New South Wales since 1908. In February 1995, the smelter (then owned by Southern Copper Ltd) closed and went into Care and Maintenance mode.

In February 1997, the site was acquired by the present owners, Port Kembla Copper Pty Ltd (PKC). A major upgrade to smelting, refining and environmental equipment was undertaken by PKC in October 1997 to enable production of 120 000 tonnes per annum of highly refined, high value copper (copper cathode).

Following a construction programme which lasted almost two and a half years, the plant started recommissioning in early 2000. However, in July 2003 due to a significant downturn in the international copper market, the plant was once again placed into Care and Maintenance. Smelting operations formally ceased in early August 2003, and commercial refining ceased in late August 2003.

A care and maintenance plan was developed to ensure ongoing maintenance of key items of plant and equipment and the management of ongoing environment issues. A team of approximately 11 personnel were retained to manage the site during this period, which continues.

1.1.2 Phase 1: operation of copper smelter and refinery

While the site was operational, smelting and refining of copper took place. The processes are highly complex, and do not directly pertain to this project application. A flow chart showing the processes which were previously carried out at the site, and the process elements, are shown in Appendix 1.

PKC has not operated of the copper smelter and refinery since 2003, as the site is under care and maintenance. A key aim of the care and maintenance has been material recovery and rehabilitation.

1.1.3 Phase 2: post-closure care and maintenance

The PKC Smelter/Refinery complex ceased operation due to the prevailing economic conditions in 2003. Expecting that the facility would be sold and re-started, the operation was very carefully decommissioned. The former process consisted of a chain of linked unit processes, where economic value was added at each processing step. During the plant decommissioning period (just prior to the care and maintenance period) all valuable materials were progressively treated to produce the high value refined copper final product. The result of this activity was that the burden of intermediate products (that are difficult to dispose of from a commercial or environmental perspective) was not increased and economic value was maximised.

A clean up of the site was identified as being necessary, regardless of the outcome for the business. It was recognised that the rate-determining step for site activities was management of long term environmental legacy issues. This meant that the most appropriate and efficient approach was not to dispose large quantities of material off-site, but rather to progressively sort materials on site, realise value where possible, reduce the characteristic of hazardous materials, and dispose only the minimum quantity of material offsite. This approach has been diligently followed since 2003, as such there is very little extraneous material now left on the site.

Moving forward, the PKC approach continues to be one of safely extracting as much economic value as possible. Accordingly, equipment that can be non-destructively removed is being sold and reused where the demand for the equipment exists. This is currently being evaluated through a discrete marketing program. Once demolition approvals are in obtained, a reputable and capable demolition contractor will be engaged to demolish and clear the remaining plant and equipment. The fabric of the site assets also contains significant quantities of valuable materials. These have been identified, quantified and will be economically extracted as a part of demolition. The intent of the demolition is to reduce all site structures down to existing slab levels. A significant quantity of concrete will be generated by this activity. As there are a number of pits and chambers on the site that are below the local ground level, it will be proposed that rather than bring fill to site or take concrete off site, the generated concrete will be used as local fill on site. Only concrete which has been sampled and verified as being suitable to remain on site will be used to fill.

The overall philosophical approach employed will ensure that at the conclusion of demolition and site clearance, as much economic value has been recovered from the asset as possible and off-site disposal minimised, in bringing a site of some notoriety to a state ready for redevelopment and job creating activities consistent with long range plans for the region.

1.2 Site Layout

The site has been progressively developed over its 100-year history. The following diagram (Figure 3 *Site location*) shows its current layout.

Figure 1 Site layout

1.3 Facilities

1.3.1 Gas Handling System and Stacks

The Smelter is attached to a ventilation system that delivered filtered air to the main 200m stack being the large prominent structure. The first part of the gas system managed off-gas emissions that were associated with low sulphur-bearing gases. These systems were designed to collect metal fumes emitted from various stages of the process due to the very high temperatures used. The baghouse was used to remove the metal fumes from the collected off-gases by two fabric filters, prior to release via the 200 metre tall stack.

The remaining part of the system treated the medium to high sulphur bearing gases that are generated as a consequence of the smelting process. The sulphur in these process off-gases was removed in the Acid Plant, prior to release via a separate 100 metre tall stack. As part of the off-gas handling process, prior to the Acid Plants, two Waste Heat Boilers (WHB) were used. These units reduced the amount of liquid effluent, and reused waste heat. The remaining gas was then passed onto the Acid Plant and then (subsequently) the 100 m stack.

1.3.2 Billet Plant

The Billet Plant, built in the 1960's, is owned by and located on PKC land, and is currently operated under a lease by Metal Manufactures. Copper scrap and refined copper (previously supplied by PKC) are fed to an induction furnace. The resultant liquid copper is drained from the furnace and continuously fed into a vertical billet caster. Once cast and cooled, the solid billets are sawn into five foot lengths as it emerges from the continuous caster. The billets are then fed to a tube and pipe making facility (on the adjacent Metal Manufacturers plant).

1.3.3 Water Treatment Plant

The Water Treatment Plant was designed to treat waste water to produce clean water suitable for re-use within the plant as process water. "Process waste water" was generated from various processes in the PKC plant, including the acid plant gas scrubbing system and wash water from various cleaning operations. In addition, the first 10mm of rain falling on the site (the first flush) is captured as "storm water" in a system of collection pits for treatment in the Water Treatment Plant.

The wastewater treatment plant remains operational at the site, and treats the first flush of storm water runoff. The treated storm water from the plant is able to be discharged to a local storm water main under licence conditions prescribed in the Environmental Protection Licence for the site (Appendix 2).

1.3.4 Bulk Concentrate Store

The Bulk Concentrate Store housed the copper concentrate which was the main feed stock to the Smelter. It was in the form of a damp (about 6% moisture) powder. The Concentrate was of the sulphidic type (containing sulphur), which generally contained around 25-35% copper.

These concentrates were primarily composed of Copper (Cu), Iron (Fe), and Sulphur (S) in varying amounts. Associated with these concentrated compounds were varying amounts of other impurities and unseparated parent rock (gangue).

The most common ore found in the concentrates was Chalcopyrite (chemical formulae $CuFeS_2$) having a nominal content of 34.5% copper and 35.0% sulphur.

1.3.5 Blending Shed

The Blending shed was used to combine feeds from multiple sources into the target blend suitable for efficient furnace operation.

1.3.6 Smelter

During the time of the plant's operation, smelter feed was received onto site, stored, blended, in two large sheds, and fed to the Smelter. The Smelter consists of a number of large connected furnaces in the largest building on site.

The process of smelting Copper Concentrates (enriched ores) to produce anode copper (99%+ copper) was achieved by a unique blend of furnace technologies at PKC.

The anodes produced in the smelting process were loaded into the Tankhouse for the refining stage of the copper production process.

1.3.7 Refinery (Tankhouse)

The Smelter output (copper metal anodes) was transported by internal road to the Auxiliary Building, which is a large open shed for storage prior to being fed to the Refinery. The Refinery consists of a large open building filled with 480 large tanks, that contained copper electrolyte, and a number of dedicated cranes and machines that handled the anodes and produced the final product – sheets of pure copper cathode.

1.3.8 Auxiliary Building

The auxiliary building has been unused since smelting and refining activities have ceased on the site. During operation, the building was used to store copper anode and cathode, and to prepare product for sale. The building also housed the indirect cooling system for one of the furnaces and the small water softening plant.

1.3.9 Acid Plant

Sulphur, which was present in the smelter feed (concentrate), was recovered at the large Sulphuric Acid Plant, which is located to the east of the smelter.

2 Project Description

2.1 Project Overview

PKC intends to prepare the copper smelter and refinery site for divestment. This requires three key activities to be carried out:

1. Maximising recovery of equipment and materials at the site
2. Demolition of site structures
3. Material removal and disposal

This will involve removing all structures from the site. The processes associated with these works are outlined in further detail in section 2.6 *Description of Works* on page 12.

PKC is currently marketing useful plant and equipment for sale. By the conclusion of demolition and site clearance during 2010, it is anticipated that the site will have been sold for general industrial port related re-development.

Developments relating to other land owned by PKC do not form part of this application.

2.2 Need for the Project

PKC wishes to divest its interest in the now-disused copper smelter and refinery site. In its current state, it is not a going concern, and should to be demolished to make way for alternative value-adding developments.

PKC is the only viable party to undertake the demolition activities, given that the site has a history of environmental contamination which needs to be managed appropriately. PKC has both ethical and financial reasons to undertake environmentally sensitive works on the site. Its parent company is a large public Japanese company (Furukawa Metals & Resources Co Ltd) which has shouldered all regulatory, social and environmental responsibilities since ceasing operations in 2003, and fully intends to continue to honour all obligations through until the conclusion of demolition, site clearance and sale of all assets. It is also a financial imperative to ensure the ongoing environmental liability of the site is at a low risk level for future owners.

Furthermore, the current risk to public safety due to the condition of the 200 metre stack is unacceptable.

The stack has been thoroughly assessed to determine its current condition, and whether it complies with the necessary standards and regulations. The stack's two possible outcomes, demolition or management *ad infinitum*, have been considered in light of the assessment, and it is apparent that the public safety risk of retaining the stack is unacceptably high, and it must therefore be demolished.

Key findings from two expert reports include:

- The stack does not comply with the Concrete Code (URS, 2008);
- The stack does not comply with the Earthquake Code (URS, 2008);
- The stack's external structure is severely compromised due to carbonation. This is causing it to shed pieces of concrete as it deteriorates. It has been noted that the pieces "can travel relatively long distances from the chimney, particularly if dislodged during windy weather" (Southern Steeplejacks, 2008). The pieces can cause an especially high level of damage due to their acceleration during descent; and

- "Deterioration of some of the annular floors has now become severe. Since these floors support the heavy brick liner, the consequences of failure of these items could be catastrophic." (Southern Steeplejacks, 2008).

The stack cannot be renovated to a point where it complies with the Concrete or Earthquake Codes. The cost to render it a medium or better risk to public safety has been estimated by the two expert firms to be in the order of $1 000 000 (URS and Southern Steeplejacks). Ongoing maintenance would cost around $90 000 every 3 years to help prevent concrete from falling off the stack and onto the site or neighbouring sites.

PKC notes that the only viable option is to collapse the stack in a controlled manner to fell the stack within the PKC site.

2.3 Alternatives Considered

There are two alternatives to demolishing the site:

1) Recommission the site for its previous purpose of copper smelting and refining, or
2) Continue to keep the site closed under care and maintenance.

2.3.1 Recommissioning

While it was initially expected that the site would be prepared for sale and recommissioning, it has now been established that there are no suitable options for sale of the site as a copper smelter and refinery.

In a global market, a 120 000 tonne smelter refinery complex is too small. Successful copper smelting and refining complexes in Europe and Japan are now in the 400-500 000 tonne range which enables economies of scale with respect to operating costs.

Expansion plans for the complex were contemplated by the owners, but the excessive capital cost was a significant deterrent to internal approval, particularly considering the proximity of the site to residential areas. Even considering that compliance with consent and license conditions were largely achieved, the site had a difficult relationship with a small number of its neighbours.

The primary commercial determinants of revenue for PKC were the terms agreed between PKC and its raw material suppliers (Treatment Charge T/C, Refining Charge R/C). These are globally derived parameters, which had fallen to very low levels in 2002, 2003. Whilst T/C and R/Cs, which are largely independent of copper price, have recovered somewhat they are still at a level that would be considered sub economic for PKC to operate and generate acceptable returns.

The only serious purchase enquiries for PKC since 2004 have been for alternative development opportunities. There have been none to re-open the site as a copper smelter and refinery, despite a global marketing effort during 2003 and 2004.

2.3.2 Remain Closed

It is not viable for the site to remain closed. There are two practical reasons for this:

1) It prevents the site from being used for income- and employment-generating activities, and
2) It represents an unreasonable ongoing burden on the current owners from both a financial and liability perspective, especially given the unsound nature of the main 200 metre stack.

2.4 Staging

The project will be staged so as to ensure its objectives are met: to minimise any risk of harm to the environment and duration, and to maximise efficiency and cost effectiveness. The demolition activities will also be staged such that the buildings near the border of the site are demolished last, so that they can provide attenuation from environmental impacts offsite.

In practice, this will mean that the Blending Shed near the Military Road boundary of the site, and the nearest to potentially sensitive receivers, will remain in situ until the other site structures have been removed. This building will effectively act as a noise attenuation barrier between the works on site and the receivers, until the end of the project. Further noise mitigation measures are discussed in Section 4.4.4 on page 42.

Additionally, the extent of noise and dust impacts will be minimised by removing the contents of the buildings prior to demolition. This will include piping and non-structural steelwork which will be recovered for scrap. Major pieces of heavy equipment (such as smelters) will also be removed from the buildings where practical. Such equipment may include the two smelters, which represent the bulk of the building internals. PKC has sought buyers of this equipment and commercial negotiations are underway.

Where the large internal structures are able to be removed prior to demolition, the project objectives will be enhanced. Demolishing the emptied buildings will be much simpler, improving the health and safety of workers and reducing the duration of demolition activities and therefore their impacts.

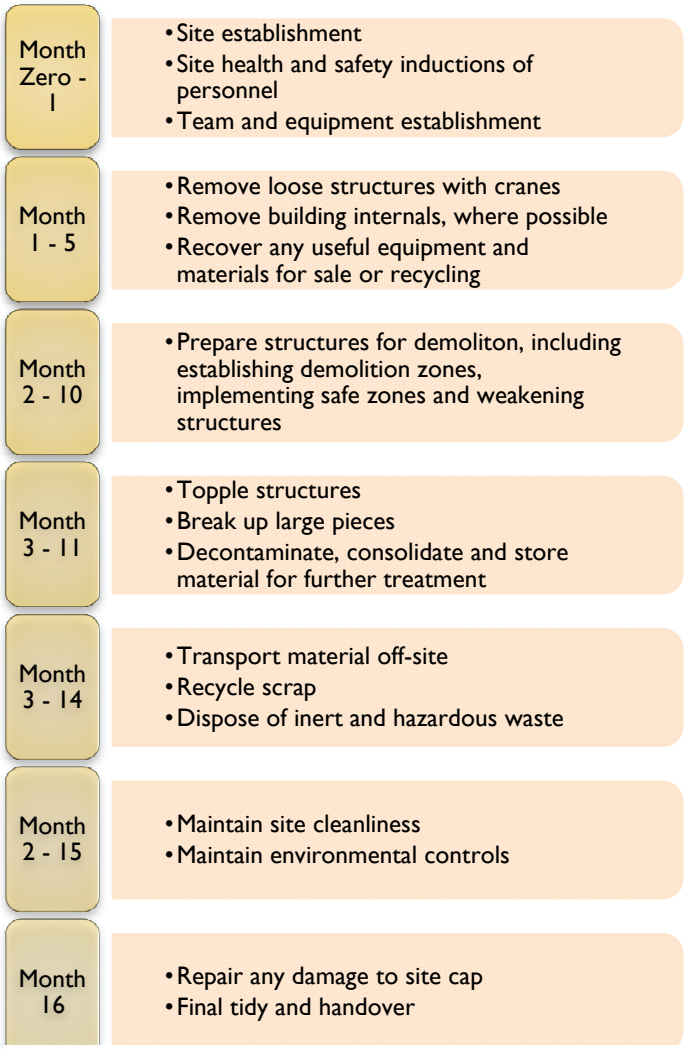


Figure 2 Project staging

It is likely that several stages will overlap as the site is divided into "zones" which become sub-projects. The Demolition Management Plan will provide the detailed timing of the project, including the staging and order of demolition of the zones, in order that the project progresses largely from a north-east to south-west direction to minimise impacts on nearby receivers.

Figure 2 indicates the timing should the entire site be demolished, and is subject to change. In particular, the stages will likely overlap for different zones. Please note that Month Zero indicates the time when the project approval is granted.

2.5 Location, Zoning and Nearby Land Use

The project site, for consideration under this application, is located in Port Kembla, south of the city of Wollongong, in the Wollongong Local Government Area. Its location is shown in the following map.

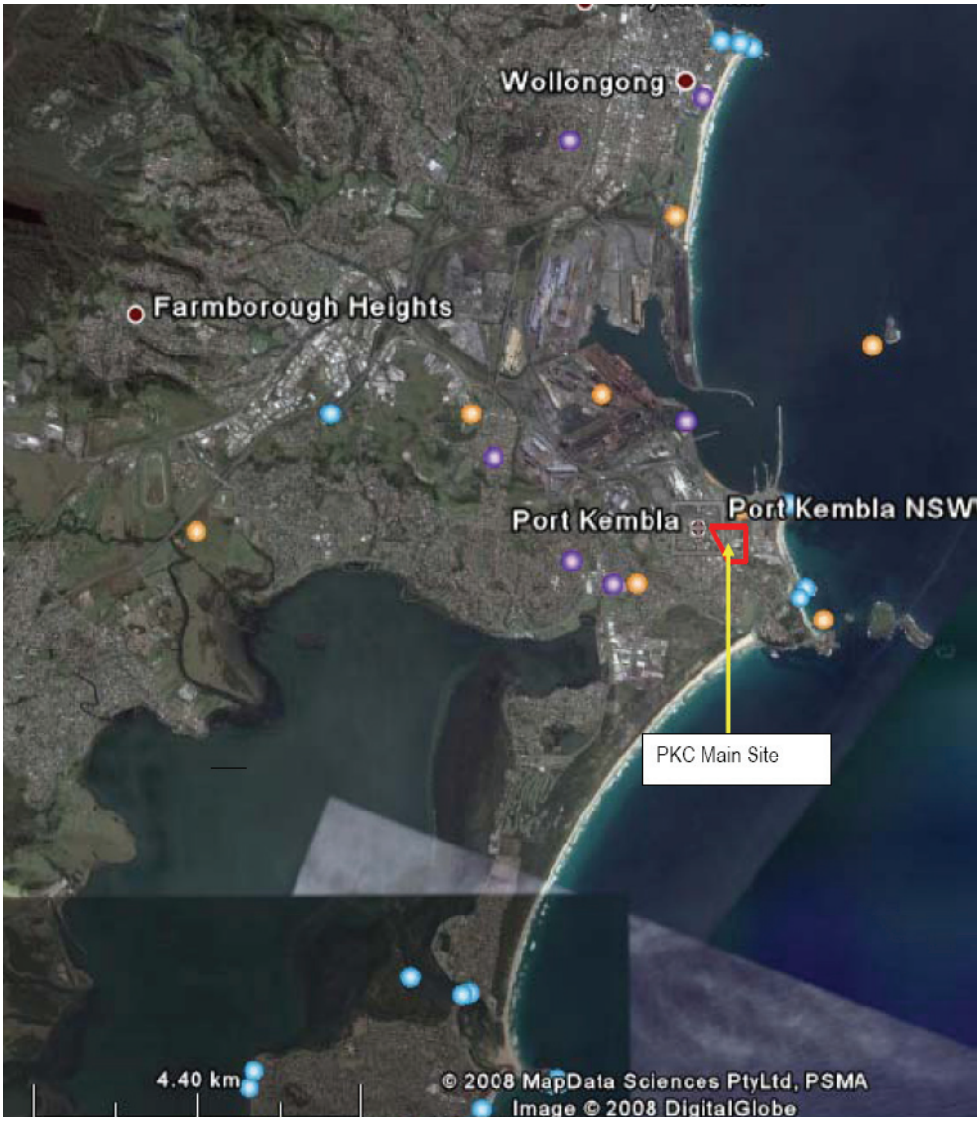


Figure 3 Site location

The site is situated in the Port Kembla industrial area, which is adjacent to commercial and residential areas. The site context is shown below.

Figure 4 Site context

The project site is the land containing the disused smelting and refining equipment, which is to be demolished. This is located on the following Lots and DPs:

- Lot 21 on DP 546139
- Lot 127 on DP 257531

PKC has a number of other land holdings which are not considered in this Project Application. Some lots ajoin the site but do not contain any structures, and therefore will not be subject to any demolition works; they therefore do not require environmental assessment as part of the demolition project.

The project site is zoned 4B Industrial – Heavy. The zoning and surrounding land use is shown on the following diagram, Figure 5 *Site zoning - current*.

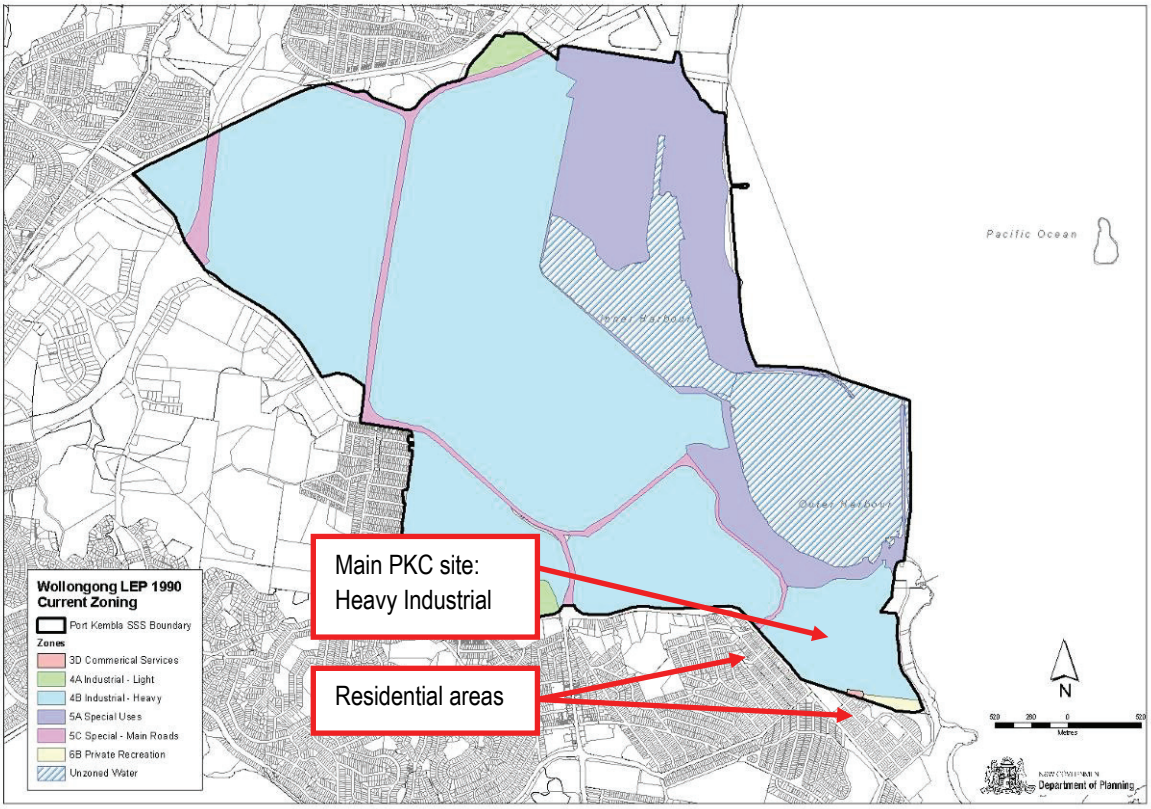


Figure 5 Site zoning - current

(Source: Three Ports Proposal, NSW Department of Planning)

The aims and objectives of the current zone under the Wollongong Local Environmental Plan 1990, 4B Heavy Industrial, are:

a) *To provide suitable areas for those industrial enterprises that should be kept well away from residential neighbourhoods, and*

b) *To make the best use of public utilities and infrastructure required by substantial enterprises, and*

c) *To allow some diversity of activities that will not prejudice achievement of the objectives referred to in paragraphs (a) or (b) or significantly detract from the operation of existing or proposed industrial enterprises.*

Reopening the copper smelter would not be possible under the current zoning, as the site immediately adjoins residential areas, thus failing objective (a).

It is important to note that the site falls within the jurisdiction of the proposed State Environmental Planning Policy, "Three Ports State Significant Site Proposal", prepared by the NSW Department of Planning. This aims to enhance the Port's employment and income generating capabilities. It is proposed the PKC site be rezoned IN1 General Industrial.

The new zoning's aims and objectives are:

- *To provide a wide range of industrial and warehouse land uses*
- *To encourage employment opportunities*
- *To minimise any adverse effect of industry on other land uses*

Permitted uses with consent are:

> *Depots; Freight transport facilities; Light industries; Neighbourhood shops; Standard industries; Warehouse or distribution centres*

Definitions of these activities are:

> ***standard industry*** *means an industry not being a heavy, light, offensive, hazardous or extractive industry or a mine.*
>
> ***light industry*** *means an industry, not being a hazardous or offensive industry or involving use of a hazardous or offensive storage establishment, in which the processes carried on, the transportation involved or the machinery or materials used do not interfere with the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil, or otherwise.*
>
> ***warehouse*** *or* ***distribution centre*** *means a building or place used mainly or exclusively for storing or handling items (whether goods or materials) pending their sale, but from which no retail sales are made.*

Approval of this Project would enable the site to be used for any of the purposes outlined as meeting the aims and objectives of the proposed zoning of IN1 General Industrial.

2.6 Description of Works

Readying the site for future use will involve removing all structures from the site down to slab level.

PKC will clear the site in the most environmentally, socially and economically responsible way. In practice, this will mean that works are prioritised to have the highest level of efficiency, and therefore least possible impact. In practice, the staging of the project will depend heavily on the contractor selected, and the extent to which equipment may be able to be sold for other purposes.

The total cost of the demolition and site clearance is in the order of $7-10 million.

PKC will select a demolition contractor with the necessary skills and experience for the project, in an open tender process. It is expected the contract will be awarded by early 2009, at which time PKC will begin working closely with the contractor to plan the operation in detail.

2.6.1 Material Recovery and Management

Maximising recovery of valuable or reusable material from the site is a high priority for the demolition project. The reasons are twofold: firstly, there is a high intrinsic value in the plant and equipment retained in the site, and secondly, the environmental impact of the project will be minimised through careful dismantling rather than traditional demolition. For these reasons, any equipment that can be economically removed and sold for re-use will be.

There is a strong market for this high-value equipment, and PKC is actively seeking buyers through several means.

In addition to equipment which will be sold for reuse, it is estimated that some 15 000 tonnes of ferrous scrap will be recovered for recycling. It is further estimated that non-ferrous scrap such as stainless steel and copper will be recovered for recycling. There are also several thousand tonnes of clean concrete on site, which will be crushed and made available for recycling for various uses, such as road base. This material could alternatively be used on site to aid in its final levelling.

2.6.2 Management of Regulated Materials

Prior to demolition, all regulated materials will be managed. This will involve the removal, handling, characterisation, transportation, and disposal/recycling of including, but not limited to, the following items:

- 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)
- Pressurized gas cylinders
- Tanks and vessels containing chemical substances and acids
- Building control and process piping residuals

Further decommissioning and decontamination will progress along the following lines:

- Decommissioning of aboveground building control systems, including draining and proper management of fluids and solids (where applicable) in order to render these systems free of residuals prior to demolition. Any piping related to potentially flammable materials shall be rendered inert by purging in an appropriate and approved manner.
- Decommissioning and staging of all electrical transformers.
- Decommissioning of below-ground utility lines or process lines in order to render them free of residual material as described in this document. This may include cleaning of process lines and sewer systems, including horizontal lines and vertical leads within the project area. All residual materials and rinsate shall be collected and properly handled, characterised and disposed of in the appropriate manner. The site wastewater treatment system may be able to receive certain washing effluent. PKC will approve all

effluents that the demolition contractor wishes to dispose of in the site's wastewater treatment plant to ensure it will meet existing licence conditions.

- Purging and decontamination of sub-grade pits, if the demolition contractor intends to dispose of the concrete as construction debris or as recyclable material. Each concrete surface that contains oily or other residual accumulations of an extent greater than 50 square meters in area (if concrete will be disposed) or 25 square meters in area (if concrete will be recycled) shall be decontaminated as appropriate and validated by PKC.
- On building surfaces such as walls and ceilings:
  a) Where significant accumulations (spadeable amounts) 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 disposed of appropriately (see Section 4.7 on page 46. Furthermore, demolition of structures which are likely to contain 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. Spading and storage of this dust will not be possible, so 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.

2.6.3 Demolition

The following principles will be followed prior to and during demolition.

- All structures on the PKC main site will be demolished to slab level.
- The Site 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.
- All site curbing will be retained as it is an inherent part of the environmental protection measures (control of surface water run-off) for the site.
- Any material which is potentially contaminated will be staged on-site in the Bulk Storage Building prior to further management.
- Following validation testing, contaminated material will be loaded, transported and disposed of at a licensed [and approved] off-site facility.
- The Site contains structures that are heritage listed. All works will protect these structures from all damage.
- The Site contains a network of groundwater monitoring and pumping wells that are to be protected during the project.

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 gear suitable for individual structures. These highly mechanised techniques ensure optimum operator safety through separation from the work faces. 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 will be designed, evaluated and approved 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", every step of the demolition process will be planned and scheduled using Work Method statements which form the basis for Job Hazardous Analysis and Demolition Risk Assessment Workshops which are essential to guarantee public and operator safety. The contractor engaged for demolition shall hold a Demolition Class 1 licence that conforms with the requirements of *AS 2601-2001 – The demolition of structures*.

2.6.3.1 The 200m main stack

The stack consists of an internal brick and external steel reinforced concrete partitions. It will be demolished by a specialised stack demolition contractor who is suitably qualified and experienced in similar techniques and applications.

The stack will be felled using an explosive technique, which was assessed to be the only practical and safe technique for a project of this size. Initially, the stack will be drilled with holes which will receive the explosive material.

The hole pattern will be set out in accordance with AS2187.1, AS2187.2 and the engineer's experience. The purpose of situating the holes as such is to insert the explosives at the points in the base of the stack at the front and side which will enable it to be felled in a controlled direction within the felling zone. This pattern also minimises risk to the workers as it does not itself weaken the structure. The drill points have been used by the contractor in about 15 other stack demolitions, and have been able to achieve an accurate fall path in 100% of cases.

The type and quantity of explosives will be determined in accordance with AS2187.1, AS2187.2 and the engineer's experience. The quantity used will be the minimum estimated to ensure a complete collapse of the base of the stack at the fell side. Explosives will only be handled by licensed contractors who have suitable experience with similar structures and hold a NSW Explosives Unsupervised Handling Licence.

Electronic detonators will be attached to the explosive charges in order that all personnel are able to stay in a safe area during the detonation. It may be necessary for these personnel to be situated within the exclusion zone area, located in a safe and well-covered area of the site as deemed safe by the explosives engineer and as per the activity specific risk assessment.

The explosives are placed to sequentially detonate in accordance with the blast design, which minimises the quantity of explosives used and ensures that the section of stack at the base is removed allowing the stack to fall in the planned direction. The stack remains structurally sound during its fall which enhances the accuracy of the fall path.

Previous stack demolitions by this contractor and of this type of stack have all been successful on both accuracy and safety criteria. For example, the Swanbank stack demolition project involved the dropping of three 123m stacks of similar construction and design to the PKC stack, with a mass of 3500t each.

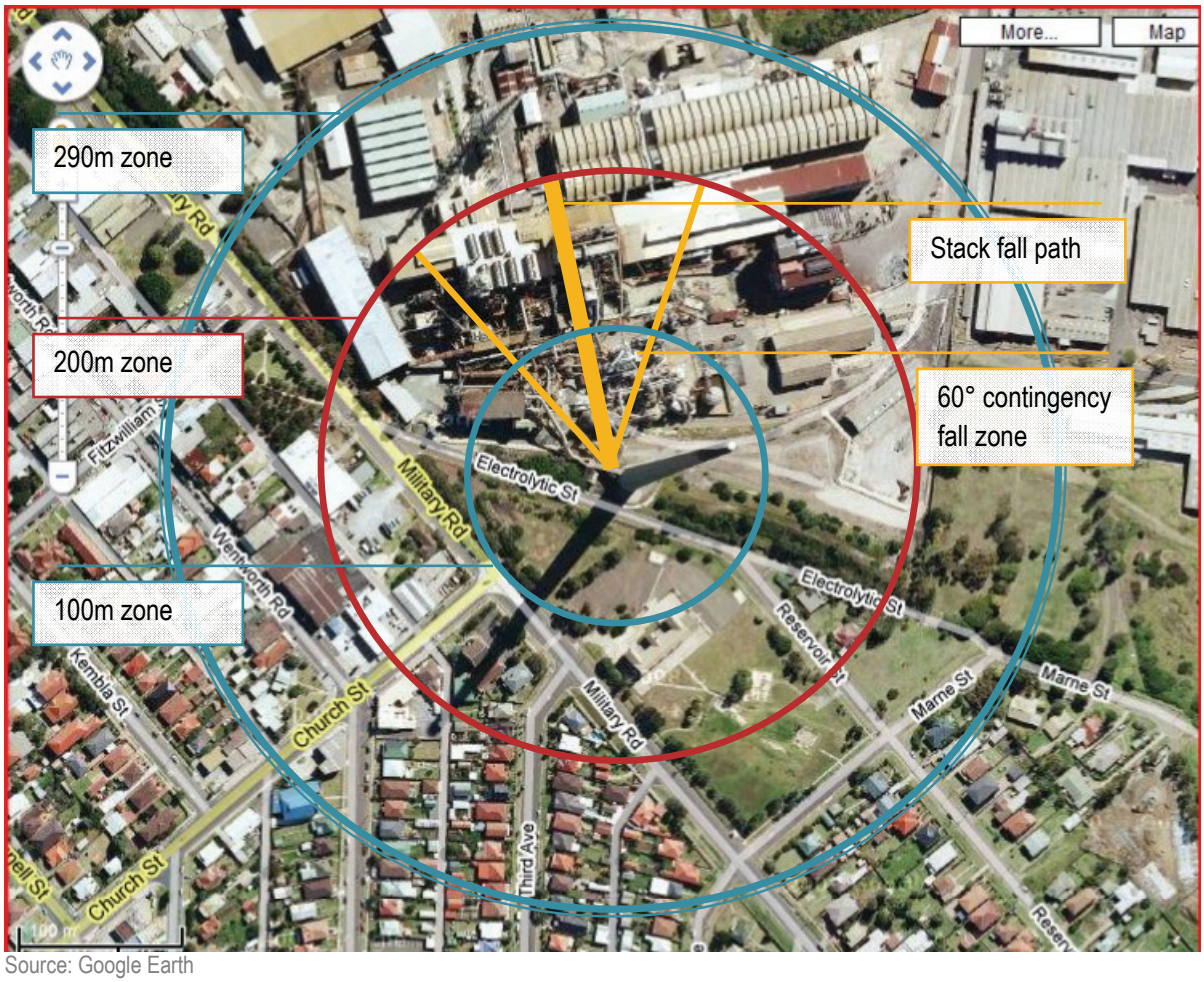
At the point of detonation, a time call will be announced. The stack will fall into a sheet of water to minimise any dust emissions as it falls.

There is an extremely low risk that the stack will fall outside the estimated fall zone. The consequences of this will depend on how far outside the predicted fall path it falls. The fall path will lie in the middle of the site, so a variation in fall path by up to 30 degrees in each direction (as per AS2601 -2001 Demolition of

Structures) will still result in the stack falling within the site boundaries. The main effect of such an outcome is that the stack will not fall into the water sheet, and the dust emissions will therefore be higher. Given that the stack was internally washed and capped at the time of decommissioning in 2003, any dust emissions are unlikely to be contaminated. It is considered practically impossible for the stack to fall outside this range of error.

An indicative fall path and proximity zones are shown in the following figure, Figure 6. A detailed plan which shows the proximity zones will be prepared as part of the Demolition Management Plan.

Figure 6 200m Stack Fall Path and proximity zones (indicative, not to scale)



Source: Google Earth

Further management measures for the demolition of the stack will include:

- Establishing an exclusion zone for around 4 hours which will require evacuation of the nearby residences and businesses for that period. The zone dimensions will be detailed as part of the DMP, and will ensure there are no persons present within at least 200 metres from the base of the stack
- Acquiring permits to close the roads within the exclusion zone, and implementing the closures utilising specialist traffic contractors
- Minimising dust generation through the use of water cannons directed along the length of the stack and drop zone
- Minimising vibration through strategically emplacing rubble piles around the felling path
- Using appropriate physical barriers, such as existing buildings or container wall/s, to suppress fly material

- Making good any damage to buildings or other improvements which can be attributed to the stack's demolition – as outlined in Section 8.1 *Community Notification* on page 66

Further management measures are described in Section 4 *Existing Environment and Mitigation of Potential Impacts* on page 26.

The demolition of the stack will be subject to the standard risk assessment and management procedures. The Demolition Management Plan (DMP) will include details of any additional measures required to minimise the environmental effects and workplace exposures.

2.6.3.2 Gas Handling System and 100m stacks

The Gas Handling System consists of large ducts and fans, most of which are clad in synthetic mineral fibre, and may contain some dusts and residues. Specialist contractors will be engaged to remove any identified residual industrial materials within the ducts before standard demolition of the main structures.

2.6.3.3 Billet Plant

The billet plant is currently operated under lease by Metal Manufacturers Ltd. There are two options for the demolition of the plant:

1. Sale of equipment to the present owners for reinstatement on their adjacent site, which is further removed from existing residences. Then demolition of the remaining building
2. Removal of equipment by sale or alternate disposal, and demolition of the remaining structure

Discussions between the parties will determine the most appropriate outcome; however, PKC will be seeking approval for both options as part of this project application.

2.6.3.4 Bulk Concentrate Store and Blending Shed

The equipment essentially consists of conveyor belts and trippers. The mechanical equipment is specialised, consisting largely of heavy steel, which will be removed prior to the main building being removed by standard demolition techniques.

2.6.3.5 Smelter

The smelter is the largest building on site, and contains the most equipment, including the six furnaces and related service equipment. Large items such as furnaces and boilers will likely be removed by heavy-lift cranes and standard demolition practices. Removal of the large plinths may require the use of small-scale explosive assistance.

2.6.3.6 Refinery (Tankhouse)

Refinery equipment will be removed by crane prior to standard demolition of the main structure.

2.6.3.7 Auxiliary Building

The auxiliary building is largely empty; the process equipment within the building will be easily removed before the building is removed using standard demolition practice.

2.6.3.8 Acid Plant

The Acid Plant consists of large ducts and steel vessels. Specialist contractors will be engaged to remove any identified residual industrial materials within the ducts, and sulfuric acid in the converters. The main structures will be removed using standard demolition practice.

2.6.3.9 Water Treatment Plant

It is anticipated that the Water Treatment Plant will be required to treat run-off and storm water during and following demolition. Any discharge of storm water off site will be in accordance with the Environmental Protection Licence. The Water Treatment Plant, which consists of a few tanks and pipes, will be removed once it is no longer required – this may occur some time after demolition of the other site structures.

2.6.4 Site Surfacing and Final Landform

An integral part of the site Voluntary Remediation was capping of otherwise uncapped areas. This work is underway and will be completed by end 2008. Any damage caused to the site cap during demolition will be made good at the conclusion of demolition activities.

Once the demolition of the structures has taken place, the slabs will be exposed. These slabs will form part of the surface cap. Any pits which sit below the final level will be filled with appropriately treated demolition waste, such as concrete, and then sealed.

Where buildings and structures act a boundary walls or fencing, fencing is to be erected in its place following demolition of these structures.

The site is built in a stepped configuration. Railing protection of an appropriate characteristic is to be installed in designated areas to mitigate the risk of accidental falls.

The final profile of the site will ensure the protection of the existing cap and minimise any disturbance to underlying contaminated soil. The cap also forms part of the remedial approach for groundwater under the Voluntary Remediation Agreement. The property shall be graded to allow adequate storm water drainage to the water treatment plant. Graded areas shall be properly sloped. Sedimentation and erosion controls are to be installed, where required. A final site grading plan will be developed in conjunction with the demolition contractor that illustrates final site contours and erosion control measures.

The following figure shows the contours of the site, which will be maintained as a result of the project.

3 Environmental Risk Assessment

The assessment and management of risk is a crucial part of industrial operations to identify and minimise major risk contributors in an industrial environment. The main steps involved in a risk analysis are: incident identification, consequence analysis, probability and frequency estimations, and lastly a quantitative risk assessment.

The potential environmental risks resulting from the demolition works at the Port Kembla Copper site are discussed further in the following sections. As outlined in Section 2.6 *Description of Works* on page 12 above, the proposed demolition works will comprise three key components; the non-destructive removal of plant and equipment, the felling of large structures (including some equipment) and the recovery or disposal of materials on-site and off-site. 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.

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 and management practices. The risk ratings will likely further reduce after the management practices are further developed, and these will be reflected in the management plans (see section 8.4 *Management Plans* on page 68).

Table 1 Potential environmental risks from the project

Environmental Aspect	Activity	Environmental Impact	Original Environmental Risk Rating	Managed Environmental Risk Rating
Hazard and safety	• Dismantling of absorption towers on acid plant	• Residual sulphuric acid in absorption towers will be removed with excess amounts of water resulting in an exothermic reaction and potential generation of acid mist	High	**Medium**
Air emissions	• Dismantling equipment, including the absorption towers on the acid plant • Felling of large structures • Size reduction and sorting of demolition materials	• Potential release of dust into the atmosphere from process areas and areas where building materials may be present in small quantities • Potential impacts on air quality and stormwater (through deposition)	High	**Medium**
Noise and vibration	• 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 • Moving materials around site from demolition activities	• Spillage of material during transport impacting on stormwater or soil • Impact on road network and road safety	Medium	**Low**
Wastewater	• General demolition activities and release of dust and hazardous material into the air • Hosing down equipment • Spillage of water from plant • Hosing down recovered scrap	• Generation of wastewater contaminated from wash down of equipment and dust release • Escape of wastewater to environment and impacting on stormwater, surface water bodies and potentially soil	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	• 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	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	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**

3.1 Medium Environmental Risks

The environmental risk assessment identified three aspects associated with the demolition activities as posing a medium environmental risk after standard mitigation measures. These aspects are:

- Hazard and safety;
- Air emissions; and
- Noise and vibration.

3.1.1 Hazard and Safety

The primary hazard for a demolition project is the risk of falling objects striking a worker or passer by. This risk is usual for projects of this kind, and management measures will include those outlined in Section 4.9.2 *Occupational Health and Safety Hazard* on page 55.

To reduce any potential for sulfuric acid mist to be generated from the dismantling of the absorption towers associated with the acid plant at the site, the absorption towers will be washed with excess quantities of water to remove any residual sulfuric acid coated on the inner surface of the towers.

The dismantling and washing of the absorption towers will be managed appropriately and in accordance with recognised procedures, and will be detailed in the DMP.

3.1.2 Air Emissions

The proposed demolition activities may result in the disturbance and release of some 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 and acid mist 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.

A demolition air quality strategy will be applied to minimise the impact of airborne dust. The demolition contractor will prepare an Air Quality and Dust Management Plan, which will be based on a risk study on the procedures required to control the generation of dust from the demolition process. The proposed demolition will involve a number of steps to mitigate and monitor possible air quality impacts. Operational areas and major access roads will be watered down during demolition. During strong winds felling operations will cease and commencement of works will be reassessed. Dust generation is best managed through the day-to-day assessment of operations. The effects of dust on health and amenity resulting from demolition activities will be communicated within the demolition team to minimise potential dust causing activities. Other methods of mitigating the generation of dust emissions proposed for the works are outlined in Section 4.1.1 on page 26.

Dust levels including PM_{10} and Total Suspended Particulates (TSP) will be measured throughout the demolition process and monitored against benchmarks.

With regard to the 200m stack, the risk of contaminated emissions has been assessed and rated as low. The stack's surface has previously been decontaminated by low pressure internal washing, which took place shortly before the plant was decommissioned in 2003. The stack was then capped. As a result, there will be minimal or no surface dust in the stack.

Given the potential for dust emissions to be generated during the felling of the stack, its interior was recently subject to an assessment by specialist steeplejacks, who were engaged by PKC to assess the presence and thickness of visible residue on the interior of the stack. This assessment found that the thickest residue (approximately 1 mm) was present in the upper sections of the stack. Samples of bricks and mortar (coated in the residue) were taken from this and other levels with the stack for physical inspection and chemical analysis. Photographs of the bricks are attached in Appendix 4. These photographs show the condition of the interior bricks and the minimal penetration of the residue/scale in the brickwork.

Chemical analysis of samples of residue from the bricks and mortar (attached in Appendix 5) indicated that it is enriched in selenium, copper, lead and arsenic. However, the total mass of these contaminants (based on conservative calculations using the highest concentrations and assuming a uniform residue thickness through the entire stack) is small. The total mass of selenium (which had the highest reported concentrations) is estimated to be approximately 15 kg. This is very low when compared with the mass of the stack, and its presence within the interior of the stack will further mitigate dispersion on demolition.

The demolition process will be a carefully planned and staged activity and include several layers of protection to ensure the health and safety of the workers and residents of Port Kembla, including:

- Maintaining a large exclusion zone around the property to mitigate hazards associated with flying debris and dust inhalation.
- Felling the stack into an area of the site where water sprays will be in operation. The specialist demolition contractor has predicted that felling of the stack is likely to occur within 5 degrees of the planned fall line, and therefore location of the sprays to mitigate the dust can be suitably planned.

On the basis of the condition of the stack and the proposed management of the demolition process outlined above, the potential for dust emissions from the felling of the stack posing a risk to the health of surrounding occupants is considered to be low.

Air quality management will be an inherent part of the Demolition Management Plan.

3.1.3 Noise and Vibration

Noise and vibrations will be generated from the proposed demolition activities potentially impacting on nearby locations. Previous mitigation works which were implemented at the site will minimise impact on neighbouring residences, including the noise wall. Additionally, demolition works will be staged in order to retain structures along the site boundaries (southern) nearest to the most sensitive receptors to further mitigate potential impacts from noise.

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. The number of truck movements is expected to be between 40 and 50 per week, on average. This is much less than the trucking numbers which applied during PKC's operational phase and therefore the noise impacts are considered likely to be low. The trucks travelling to (and from) 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.

Vibration due to the felling of structures will be minimised as part of the standard demolition practices. Management practices will include the strategic felling of structures to utilise existing buildings as noise shields, as well as emplacement of rubble material to cushion the impact of falling material.

The contractor will follow a demolition noise mitigation strategy for the site to minimise the social impact of noise. This includes informing potentially affected residences in advance as to the extent and timing of noisy activities, scheduling demolition activities such that the concurrent operation of noisy plant and/or activities is limited, limiting noisy activities to set times from Monday to Friday, using existing noise walls such as blending shed, offices and land profiles as temporary noise shields. In addition, the strategy includes noise control inductions of all employees, properly maintained equipment, controlled heavy vehicle movements, provision of a noise hotline, and an open dialogue with the community to explain the noise mitigation concept and community gains from the completion of the project.

The ground vibration will be monitored at strategic perimeter locations during felling of the main stack, which will cause the most significant vibration impact throughout the project. The volume of explosives required for the felling will be calculated by the specialist explosives contractor uniquely to the construction of the stack and in accordance with the engineering handbook formulae. Expected ground vibration due to impact will be predicted using empirical formula. Indications are that the amplitude is considered to be low compared to the relevant code criteria. The detonation of the charge will also cause minor ground vibration. Values will be converted into imperial units and plotted into diagrams to demonstrate that vibrations are expected to be well within the safe range. Seismographic vibration monitoring will be executed at defined location(s) and results will be recorded.

Vibration monitoring and noise management will be inherent parts of the Demolition Management Plan.

3.2 Low Environmental Risks

The remaining nine environmental aspects associated with the demolition activities have been identified as posing a low risk. These aspects are outlined below.

3.2.1 Generation of Waste

Lubricants and materials generated from the demolition activities which cannot be recycled will be managed and disposed of appropriately, in accordance with the DECC Resource Recovery Guidelines. In particular, hazardous building materials will be carefully and appropriately categorised and managed. As part of the demolition works, materials will be recovered and recycled where possible in accordance with DECC guidelines to minimise the environmental impact of the proposed project.

Appropriate and adequate management and mitigation measures are critical to the prevention or reduction of adverse environmental impacts. The generation, management and disposal of wastes from the demolition works will be carried out in accordance with all DECC guidelines. Any potential reuse options or improvements to management procedures will be identified, which will ensure that the effect of the demolition on resource consumption and landfilling will be minimised.

3.2.2 Generation of Wastewater

Wastewater will be generated from the hosing down of equipment and scrap materials, and may also be generated from spillages of water 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 all stormwater and run-off is directed to the Water Treatment Plant (WTP), there is little potential for this wastewater to escape to the environment through contaminated stormwater, surface water bodies and soil.

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 site WTP:

- Washing down of plant and equipment at dedicated wash bays;
- Plant upgrades and replacement; and
- General run off from site areas during rain events.

During operation of the site, these activities would have generated in the order of 20 m^3 per hour of sulfuric acid of 7% 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 sulfuric acid plant). The small amount of water collected within this bund is likely to be contaminated by diesel. The diesel tanks, and the bunds around them, will be dismantled and/or demolished either prior to or during the proposed demolition. This water will be tested, and if it is of poor quality which is not able to be treated in the WTP, it will be pumped out and disposed of off site at a licensed facility (as water potentially impacted by oil and grease) prior to demolition of the bund structures. If the level of contaminants in the water is low and within the design of the WTP, the water will be pumped to the WTP.

The bunds at the WTP form part of the plant infrastructure and will be retained. Water which collects in these bunds is processed at the WTP before release.

As indicated in Section 4.3.1.2, the volume of water requiring treatment at the WTP during demolition is unlikely to be significantly greater than the current conditions (or previously operating conditions), and would therefore be able to be captured and effectively treated by the WTP.

On this basis, and based on the requirements of Schedule 1 of the Protection of the Environment Operations Act, an amendment to the licence is not considered to be required to allow treatment of potentially contaminated run off generated during demolition.

All wastewater will be neutralised and treated at, and released from, the on-site WTP in accordance with the existing Environmental Protection Licence. Once the project is completed, the WTP will only treat surface runoff from the site. This runoff will continue to be monitored, and if it is consistently of adequate quality to be directly discharged, a Licence will be applied for which will facilitate the closure of the WTP.

3.2.3 Water usage

Water will be consumed for the wash down of plant and equipment and in dust suppression. The former PKC copper smelting operations required large quantities of water; the proposed demolition works are expected to use significantly less water than the former PKC operations.

Water will be treated in the WTP and reused to the maximum possible extent. As with water release from site WTP (to stormwater), treated water proposed for reuse on site (for dust suppression and wash-down activities) will be analysed and assessed prior to use to assess its suitability for the proposed applications. Minimal top-up water will therefore be required.

Where water recycled from the WTP is to be reused on site, it will be conveyed in pipes and fittings with appropriate and clear marking to designate that it is non-potable and not suitable for drinking. Further, during

site inductions, all site contractors will be informed that the recycled water is for washdown only. Potable water will be marked as such.

3.2.4 Traffic and transport

The proposed demolition works will generate some traffic above current levels to transport wastes and demolition equipment, and from the temporary increased employment. The local road network is adequate for the high levels of traffic associated with the smelter operation, as per the existing consent, and this project will have an insignificant impact on the network's capacity.

A short-term road closure will likely be necessary while the main stack is being demolished, for the course of one afternoon, to establish the exclusion zone. This will be targeted for a weekend so as to minimise the impact on residents and businesses.

3.2.5 Soil

It is possible that some minor disturbance to the site cap may take place during demolition activities, in the form of cracking or shearing of the bitumen surface. This would not expose contaminated soil, but may render the cap permeable. Should water ingress be possible, the cap would be repaired immediately to ensure its integrity is maintained.

All building slabs will remain intact during the project, and remain intact at the conclusion of works.

The risk of exposing contaminated soil is therefore considered very low, and the environmental or health impact of any minor exposure is negligible.

3.2.6 Energy and Greenhouse

Energy will be used at the site for the mechanical demolition, dismantling and sorting of plant and equipment. Fossil fuels will be consumed at the site during the demolition works and greenhouse gases will be emitted, however these impacts will not be significant, especially compared with the emissions and energy when the site was operating as a smelter.

3.2.7 Visual Amenity

Visual impacts associated with the proposed demolition works including temporary structures and demolition equipment, will be temporary. The removal of the existing structures will provide probable improvements to the visual amenity at the site.

3.2.8 Socio Economic

The proposed demolition works will generate a positive temporary increase in employment opportunities and the long term impact of the works will be to provide land for the attraction of new industry to the area.

3.2.9 Cumulative Impacts

Given the site location and proposed activities there is a low risk of cumulative impacts on the community and environment. The proposed facility will only generate short term air or noise impacts, and the traffic movements due to the project will not be at levels likely to impact substantially on existing flows. As such, measurable cumulative impacts are not expected to result.

Relevant matters are addressed in the following section, in the accordance with their assessable risk and potential impact on the environment.

4 Existing Environment and Mitigation of Potential Impacts

4.1 Air Quality and Odour

There is the potential for air borne dust, heavy metal pollution and odours to be generated as a result of demolition, materials handling (crushing, sorting, etc) and vehicle movements during site works. Accordingly, the demolition will be managed to limit these potential impacts on air quality, including implementation of general and targeted (for specific tasks or activities) mitigation measures. To verify that these mitigation measures are effective – and that demolition is not adversely impacting on air quality beyond the boundaries of the site - an air quality monitoring program will be conducted for the duration of the demolition works. The following sections outline the proposed monitoring program and mitigation measures for the demolition.

4.1.1 Management and Monitoring

Dust management will be performed through the implementation of an Air Quality and Dust Management Plan. The plan will provide the necessary framework and strategies to enable the demolition process to be completed efficiently and with minimal environmental impact in accordance with the environmental objectives for this project. Dust management activities may include: wetting down of structures and surfaces, using covers, use of Hessian sheeting, sealing dust generating materials into bags, the use of damp sawdust, good housekeeping procedures, and use of controlled demolition techniques.

In general, the contractor will 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.

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 requirements for the air quality monitoring will be documented in an Air Quality and Dust Management Plan, which will be prepared prior to commencement of demolition and implemented by the demolition contractor or appointed environmental consultant, in consultation with DECC. The monitoring program will, at a minimum, comprise the following elements:

- 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. These 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 these stations are illustrated in Figure 8 on page 28. The location of the air sampling stations will be reviewed and may be amended as the works progress, and may include additional monitoring locations within the residential area downwind of the smelter site to assess off-site impacts if the results of monitoring at the boundary locations are elevated above the air quality targets. The location 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 for dust deposition, TSP, PM_{10} and metals (arsenic, antimony, cadmium, lead, mercury and vanadium). Monitoring of TSP, PM_{10} 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. It is proposed that the nature and monitoring frequency of the pollutants be agreed with the DECC during consultation for the development of the Plan;
- Boundary monitoring for airborne asbestos fibres during asbestos removal works;
- 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 Figure 8 on page 28; and
- Preparation of a monthly summary report outlining the results of the air quality monitoring.

The Air Quality and Dust Management Plan will also include the following:

- Calibration requirements and records;
- Data retention requirements;
- Potential mitigation and management measures in the event that the assessment criteria are exceeded at any of the proposed monitoring stations. Possible mitigation measures are identified in Section 4.1.2,
- A notification protocol for the notification of the DECC and other relevant stakeholders of exceedances of the assessment criteria; and
- Community consultation and complaint resolution procedures.

The locations of the proposed monitoring stations and the monitoring and analytical methods outlined above are consistent with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007) (Approved Methods).

Portable PM_{10} dust monitors will be used to supplement the results from permanent monitoring stations during demolition. These portable PM_{10} dust loggers will not be used for compliance purposes, but rather as a management tool for dust suppression. The location of the portable PM_{10} dust monitors will be varied according to location of the site works, the nearest sensitive receptor and the forecast daily wind conditions.

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*. Monthly assessments will be performed at the proposed air sampling locations.

Acceptance criteria for air quality monitoring will be 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).

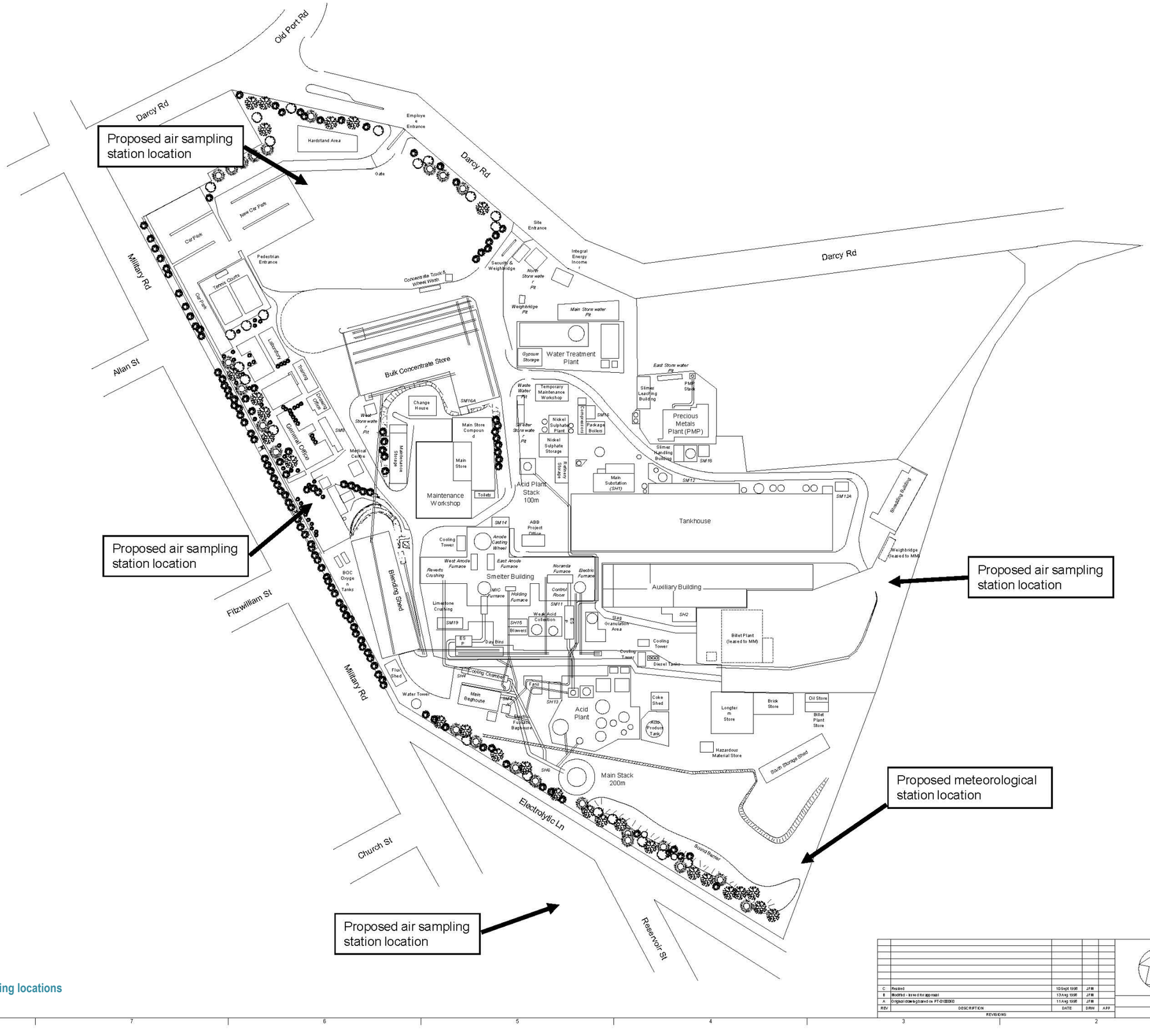


Figure 8 Proposed air sampling locations

REV	DESCRIPTION	DATE	DRN	APP
C	Revised	10 Sept 1998	JFM	
B	Modified - Issued for approval	13 Aug 1998	JFM	
A	Original drawing placed on PT-010000	11 Aug 1998	JFM	

REVISIONS

Port Kembla Copper Pty Ltd
ACN 050 259 976

General Purpose Site Plan

SIZE	TITLE NO	DWG NO	REV
A0		PT-020-0147	C
SCALE 1:1000	DRAWN John Moore	SHEET 1 OF 1	

4.1.2 Proposed Mitigation Measures

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 will be used at the perimeter of the site;
- All vehicles to use designated 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 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 PM_{10} dust loggers located downwind of localised demolition work areas. These portable PM_{10} dust loggers will not be used for compliance purposes but rather as a management tool for dust suppression; and
- Installing temporary covers, or spraying with a binding agent, of stockpiled material where necessary. Longer term stockpiles may require covering with either a HDPE or geomembrane material.

Odour mitigation measures to be implemented on site 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;
- 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.

4.2 Contaminated Soil and Water

4.2.1 Existing Environment

More than 30 investigations have been undertaken at the site and surrounding properties to assess soil and groundwater contamination. The main contamination issues identified from these investigations were:

- Stockpiling of solid process waste (fume) in the north western portion of the site (the former Fume Storage Area, FSA). The fume material had high concentrations of leachable zinc and other metals;
- Contamination of shallow (perched) groundwater with metals; and
- Contamination of deep groundwater with metals and sulfuric acid.

The source of the shallow groundwater contamination was inferred to be fill material (smelting slag and other solid process wastes) placed across the site, whilst the source of the deep contamination was leakage of acidified copper sulfate solution from the electrolytic baths (and transfer lines) located in the Tankhouse building. The locations of the former FSA and the Tankhouse are illustrated in Figure 9 *Location of existing groundwater contamination*.

The fume material stored in the FSA was excavated and removed from site in the mid 1990s. Remediation of the deep groundwater contaminant plume commenced in 1996 with the installation of 12 groundwater extraction wells installed on site and the adjacent Lot 22. Groundwater extracted from these pumps was directed to the site wastewater treatment plant for removal of the metal contaminants and discharge to stormwater.

In February 2004, the NSW Environment Protection Authority (NSW EPA) declared the site a Remediation Site based on elevated concentrations metals (arsenic, cadmium, copper, lead, manganese, nickel and zinc), sulfate and acidity in groundwater which:

- Had migrated off site onto the adjacent Lot 22 (then owned by Orica Australia Pty Ltd); and
- Was considered to pose a potential risk to Port Kembla Outer Harbour, located approximately 500 m down gradient of the site.

In response to the declaration, Port Kembla Copper entered into a Voluntary Remediation Agreement (VRA) with the NSW EPA, which was ratified on 20 April 2004. The VRA prescribed a series of works including:

- Further soil and groundwater investigations;
- Continued groundwater extraction and treatment;
- In-situ remediation trials; and
- Groundwater hydraulic and geochemical modelling.

At the completion of the VRA, the following was concluded:

- The shallow (perched) aquifer did not appear to continue beyond the northern boundary of Lot 22 (by now purchased by PKC) and therefore the contamination was considered unlikely to pose a risk significant risk of harm; and
- Modelling indicated that natural attenuation processes within the deep aquifer would reduce contaminant concentrations within the plume to less than background levels by the time it reached Port Kembla Outer Harbour. Since groundwater extraction and use between the site and the harbour was considered unlikely (based on poor yields and poor natural water quality), contamination within the deep aquifer was also considered unlikely to pose a risk significant risk of harm.

Based on the results of the VRA investigations, the NSW EPA removed the declaration on the site on 11 July 2007 and replaced it with a Maintenance of Remediation Notice (Notice 28033 of 11 October 2007), which required PKC to:

- Revise the existing groundwater model to account for the effects of pumping on contaminant migration in the deep aquifer (the modelling done as part of the VRA ignored the effects of pumping, which removed more than 50 tonnes of copper and 20 tonnes of nickel); and
- Conduct regular monitoring of groundwater quality at selected deep aquifer wells to verify that the predictions of the revised model (that the plume is being attenuated and is unlikely to present a significant risk of harm to Port Kembla Outer Harbour) are valid. The groundwater monitoring rounds are scheduled for 2009, 20011 and 2013.

The Maintenance of Remediation Notice is attached in Appendix 1.

The removal of the declaration also permitted PKC to cease extraction and treatment of contaminated groundwater from the deep aquifer, which was concluded in May 2007. The extent of the copper plume within the deep aquifer (which represents the largest plume with the highest contaminant concentrations) near the completion of pumping is illustrated in Figure 9 on page 32.

A further condition of the Maintenance of Remediation Notice was that if the plume was found to be migrating at a faster rate (and being attenuated less) than that predicted by the modelling, implementation of contingent remediation measures would be required. This could include restarting the groundwater extraction system or application of *in situ* remediation technologies trialled as part of the VRA.

In addition to the commitments required by the Maintenance of Remediation Notice, PKC also proposed capping of most of the unsealed areas of Lots 21 and 22 in order to:

- Limit exposure and erosion of fill material which may contain elevated concentrations of metals; and
- Reduce recharge to the shallow and deep aquifers, therefore reducing groundwater gradients and rates of migration of the contaminant plumes.

The capping works (along with some associated stormwater management structures) in Lot 21 (the demolition site) were completed in mid 2008.

Source:

Scale: 1:2500 (MGA94Z56)

Drawn: AJW	Approved: DRAFT	Date: 05/09/2007
Job No: 43217649	File: 43217649-017.wor	

Client

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Project

GROUNDWATER SAMPLING ROUND 2007

Title

DEEP AQUIFER GROUNDWATER COPPER (mg/L) - 2007

Figure: 19

URS

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PORT KEMBLA COPPER DEMOLITION ENVIRONMENTAL ASSESSMENT

COPPER CONCENTRATIONS IN DEEP GROUNDWATER (from URS, 2 November 2007)

Project: 087652004 Figure No: F0002
Drawn: KB Date: 03.11.2008
Checked: Date: 03.11.2008

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Figure 9 Location of existing groundwater contamination

4.2.2 Management of Contamination during and following Demolition

As indicated in Section 4.2.1 on page 29, PKC's current and ongoing commitments in relation to management of site contamination comprise:

- Maintenance of the existing cap/surface seal across Lots 21 and 22;
- Conducting regular monitoring of groundwater quality at selected deep aquifer monitoring wells to validate the predictions of the groundwater model; and
- Implementation of contingent remediation measures for deep groundwater contamination, if required.

Demolition of site buildings and structures will be to slab/ground level (see Section 2.6 on page 18 above). Consequently, building floors and paved areas will not be removed and the sealed area of the site during and following demolition will remain unchanged (compared to the current site condition). The only change will be in the effective form of sealing; specifically where buildings currently stand, sealing of the site is brought into effect by the building roofs. Following demolition, the effective form of sealing will be the remnant building floor.

If the demolition works damage existing paving systems, the paving will be reinstated. Similarly, if soil underlying paved areas is disturbed/excavated, it will be returned to the excavation and the capping restored.

The monitoring wells required to be sampled in 2009, 2011 and 2013 under the Maintenance of Remediation Notice are illustrated in the figure attached to this notice (Appendix 1). Several of these wells are located within or in close proximity to large buildings (e.g. the Tankhouse) and may be damaged by the demolition of these structures. Whilst every effort will be taken to retain the selected monitoring wells throughout demolition, if they are destroyed or damaged, the wells will be replaced as close as possible to the original location, to the same depth and using the same construction in accordance with the Groundwater Remediation Closure Plan (PKC, 5 September 2007) presented as an annex to the Maintenance of Remediation Notice.

One of the contingent measures outlined in the Maintenance of Remediation Notice is recommencing groundwater extraction and treatment. To allow this measure to be implemented as quickly as possible (if necessary), the existing extraction and treatment remediation infrastructure (wells, pumps, piping, metering and the WTP) will be carefully maintained and protected.

Prior to demolition commencing, the extraction pumps and piping will be removed, cleaned and stored so they are not damaged or lost. Whilst the majority of the extraction wells are located in Lot 22, several are located in Lot 21 and near buildings requiring demolition. As with the monitoring wells required to be sampled under the notice, every precaution will be taken to retain the extraction wells throughout demolition. If they are destroyed or damaged, the extraction wells will be replaced, as necessary. An assessment of the necessity to replace extraction wells will depend upon:

- The need to recommence pumping; and
- If recommencement of pumping is required, the productivity of the well in terms of removal of contaminated groundwater and imparting hydraulic control over the contaminant plume.

The wastewater treatment plant will remain operational during and following the demolition (in order to treat potentially contaminated surface water) and will therefore be able to treat extracted groundwater, if this contingent remedial measure is implemented.

In summary, contaminated soil and groundwater management, monitoring and remediation infrastructure will be retained, protected and replaced (as necessary) during demolition to ensure the requirements of the

Maintenance of Remediation Notice (groundwater monitoring and contingent remediation measures) and the recommendations of the VRA (capping/sealing of the site) will not be affected by the demolition works.

4.3 Water Management

4.3.1.1 Existing Management Infrastructure, Processes and Licences

The site has an established surface water management system, which includes:

- A network of internal surface and subsurface drains;
- Large capacity detention basins; and
- An operational wastewater treatment plant (WTP).

The surface and subsurface drains collect and convey surface water from the general site areas to five main detention basins (concrete pits) located at the lower (central and northern) portion of the site. Rain which falls on building roof areas is directed to the council stormwater network. The topography of the site (which is elevated along the southern, eastern and western boundaries) and the drainage network afford effective capture and containment of site surface water flows. Figure 10 on page 35 illustrates the site topography and Figure 12 on page 37 illustrates the locations of the main subsurface drains.

The locations of the five detention pits and respective catchment areas are illustrated in Figure 11. The total storage capacity of these pits is 1,965 m^3. The pits have been designed to collect the first-flush storm water run off (first 10 mm of rain) from the site and act both as water storage and sediment detention basins. There are also two intermediate stormwater detention basins located in the south eastern and north western portions of the site (Figure 10). These were recently constructed for the purpose of controlling surface water flow rates from newly sealed areas of the site.

The recent sealing of unpaved areas and associated upgrades to surface water management infrastructure (including installation of the intermediate detention basins and supplementary surface water drains) formed part of a broader approach to management of contaminated groundwater under the site (see Section 4.3 *Water Management* on page 34). Groundwater under the site is currently not used for any purpose.

Other stormwater management infrastructure on site includes recessed and level vehicle washdown areas with sumps and pump out systems to transfer accumulated water to nearby internal stormwater drains (and ultimately to the detention pits).

Stormwater which collects in the detention pits at the northern end of the site is treated at the WTP (Figure 12) prior to discharge to the adjacent stormwater culvert. This culvert carries treated water from the site and stormwater from the surrounding district into Port Kembla Outer Harbour. Since site operations were ceased in 2003, treatment of surface water has been undertaken to remove elevated concentrations of trace metals present in solution and particle suspension. During the operational phase of the site, contaminated process waters were also passed through the WTP. The WTP treatment technology is pH adjustment, settlement (flocculation) and dilution.

The collection and treatment of surface water at the site is approved by the DECC and regulated through an Environmental Protection Licence (EPL) No. 1753. The EPL prescribes stormwater quality and quantity discharge limits, required monitoring and the frequency of this monitoring. The EPL is attached in Appendix 2.

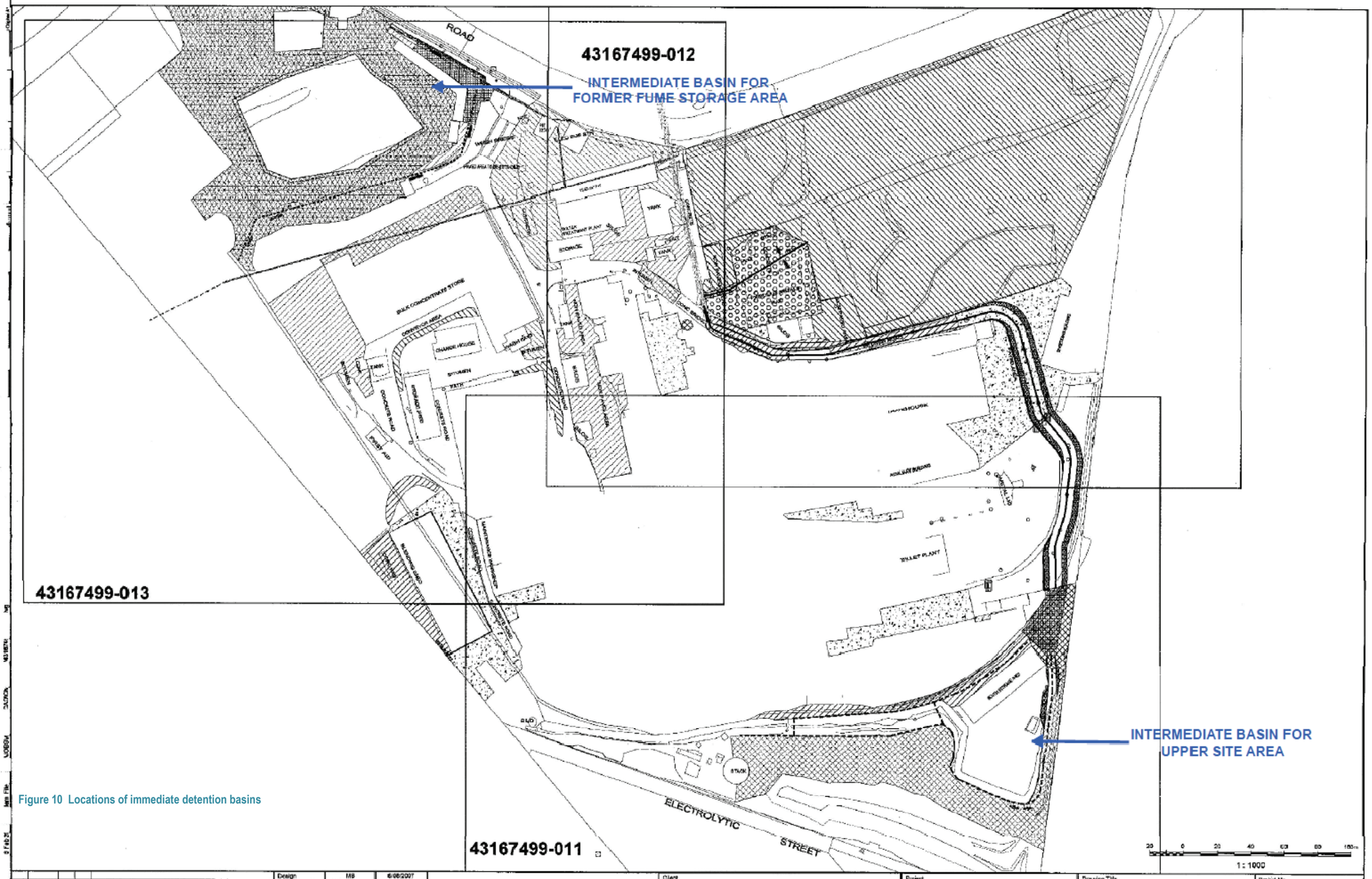

Figure 10 Locations of immediate detention basins

Design	MB	6/08/2007	URS LEVEL 3, 116 MILLER STREET, NORTH SYDNEY, N.S.W. 2060 TEL: (02) 8925 5500 FAX: (02) 8925 5555	Client: PORT KEMBLA COPPER	Project: SITE CAPPING & DRAINAGE WORKS	Drawing Title: DRAINAGE UPGRADE KEY PLAN	Project No.: 43167499
Drawn	IM	6/08/2007					Drawing No.: 43167499-010
Design Check	BS	6/08/2007				Status: FOR CONSTRUCTION	Scale (A1): NOT TO SCALE
Drafting Check	DH	9/08/2007					Rev: 0
Final Approval							
Azimuth: ISG	Datum: AHD						

Rev	Date	By	App	Amendment Details
0	06.02.2008	BR	BR	FOR CONSTRUCTION

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PORT KEMBLA COPPER DEMOLITION ENVIRONMENTAL ASSESSMENT

LOCATIONS OF INTERMEDIATE DETENTION BASINS

Project: 057652004 Figure No: F0004
Drawn: KB Date: 03.11.2008
Checked: Date: 03.11.2008

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Figure 1.1 Stormwater Catchment Areas

Port Kembla Copper Pty Ltd

General Purpose Site Plan

PT-020-0147

Figure 11 Stormwater detention pits and catchment areas

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LOCATION OF STORMWATER DETENTION PITS AND CATCHMENT AREAS

Project: 087652004 Figure No: F0001

Drawn: KB Date: 03.11.2008

Checked: Date: 03.11.2008

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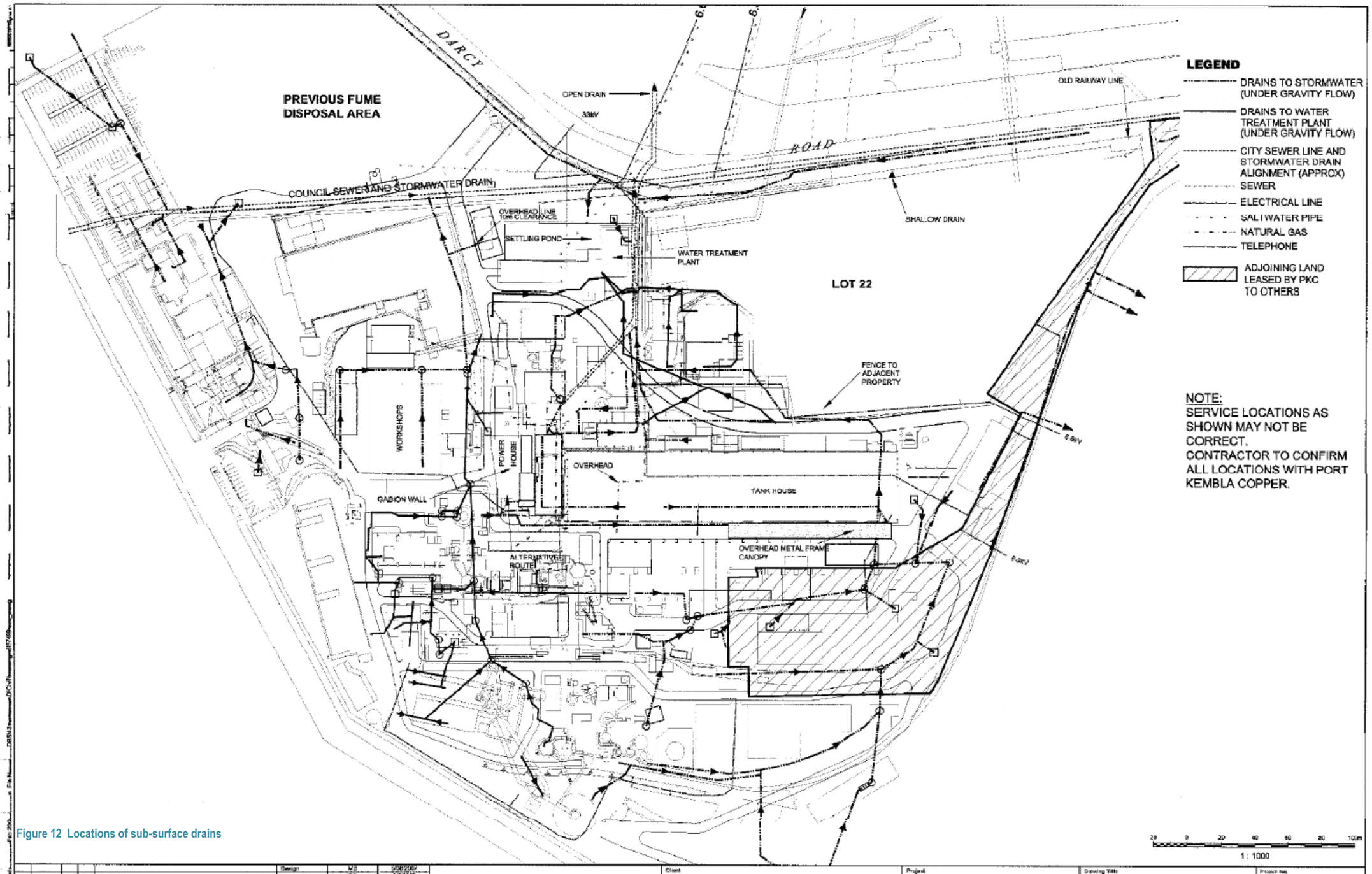

Figure 12 Locations of sub-surface drains

			Design	MB	8/08/2007
			Drawn	IM	8/8/2007
			Design Check	BB	8/08/2007
			Drafting Check	OH	8/08/2007
			Final Approval		
0	08.08.2007	SR	SR	FOR CONSTRUCTION	
Rev	Date	By	App	Amendment Details	

Azimuth: ISG | Datum: AHD

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Client: PORT KEMBLA COPPER

Project: SITE CAPPING & DRAINAGE WORKS

Drawing Title: EXISTING UNDERGROUND SERVICES PLAN

Project No: 43167499

Drawing No: 43167499-005

Status: FOR CONSTRUCTION

Scale (A1): 1:1250

Rev: 0

PORT KEMBLA COPPER PTY LTD

PORT KEMBLA COPPER DEMOLITION ENVIRONMENTAL ASSESSMENT

LOCATIONS OF SUBSURFACE DRAINS AND OTHER MAJOR UTILITIES

Project: 057652004 Figure No: F0003
Drawn: KB Date: 03.11.2008
Checked: Date: 03.11.2008

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4.3.1.2 Potential Effects of Demolition on Water Quantity, Quality and Management

The majority of the site is currently sealed. Since demolition will not continue below ground level, the area of the site covered by some form of surface seal should remain approximately the same, although areas previously covered by roof structures will be covered with concrete pads or the like. There may also be some minor additional dry weather flows from the use of mains water and/or treated surface water (from the WTP) for dust suppression, vehicle and materials washing. However, these flows will be relatively small (far less than wet weather flows) and easily accommodated by the existing drainage and treatment infrastructure.

The areas of the site where the buildings currently stand (and from which roofs rain water is directed to the council drains) will be demolished to the level of the floor slabs, which are flat and level. Due to the risk of contaminated water entering the council drains, they will be blocked off prior to demolition.

The implication of the removal of the buildings is that rain water, which currently falls on roofs will be captured by the site's internal stormwater system. Consequently, rain which falls on these areas following demolition is likely to pond and unlikely to generate significant increases in instantaneous stormwater flow. When rainwater is shed from these areas, it will be captured by the general site surface and subsurface drains and directed to the WTP for treatment. The existing drainage network, including improvements and repairs made during the recent capping program, is considered to have adequate capacity to convey the additional site stormwater flows resulting from demolition of the site buildings.

It is noted that where ever possible, clean stormwater will be separated from potentially contaminated stormwater and diverted to council drains in order to minimise the increases in site stormwater flows, WTP treatment costs and energy consumption.

The WTP is more than adequate to manage these flows during the demolition project. During operation of the site as a copper smelter and refinery, the WTP treated approximately 30 m^3 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 m^3 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.

As indicated above, 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 overland channels, gutters and pathways. 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).

The increase in overland flow is not known, but may be relatively small since:

- The floor areas of the demolished buildings (where roof water was previously directed to subsurface drains) will be generally flat and shedding of water that accumulates in these areas will be slow; and
- The existing (internal) subsurface drainage network is aged and known to have significant blockages

Therefore, the increases in overland (and total) flows may be small and are considered likely to be controlled by the existing site infrastructure and topography.

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.

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 EPL.

If sediment within the stormwater detention pits and WTP settling ponds requires removal and off site disposal, the material will be sampled and analysed for the site contaminants of concern (see Section 4.2.1 on page 29) and classified for disposal using the guidance outlined in the Waste Classification Guidelines (DECC, 2008).

As indicated above 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.

In summary, demolition of the site is considered unlikely to:

- Significantly affect surface water flows generated during rain events;
- Reduce the sealed area of the site (and therefore management of groundwater through mitigation of recharge will not be affected); and
- Affect the capacity of the existing infrastructure to manage the flow and treatment of stormwater on site in a manner consistent with the requirements of the current EPL.

If monitoring indicates that upgrades to the stormwater management infrastructure (site sealing, drainage and WTP) 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.

4.4 Noise and Blasting

Demolition work, particularly at a major industrial plant complex such as Port Kembla Copper (PKC), will necessarily involve some generation of noise because of the nature of the activities required to be undertaken. The noise associated with the project is difficult to quantify due to several factors, as summarised in the Northern Territory Guidelines for Construction and Demolition Noise Controls[1]:

- they are mainly carried out in the open;
- they are of temporary duration though in built-up areas they may cause great disturbance while they last;
- the noise they make arises from many kinds of plant and machinery, both fixed and mobile,
- that present difficult and costly measures for noise mitigation
- the noise they make arises from many different activities, and its intensity and character may vary greatly at different phases of the work;
- the sites cannot be divorced by planning control, as factories can, from areas which are sensitive to noise.

Whilst bearing these considerations, PKC intend to carry out the demolition works in a manner which causes minimal adverse impacts to surrounding residents, workers and the public. The work will therefore be managed so as to minimise noise emissions as far as possible, and where it is not possible to avoid some level of noise impact, there will be consultation with those potentially affected in order to manage the potential inconvenience.

Given that the demolition of the 200m stack is a single event of very short duration, it is considered separately in Section 4.5 *Noise and Vibration of 200m Stack* on page 45.

4.4.1 Guidelines and Standards

The following guidelines and standards are considered relevant to the assessment and control of noise for the demolition:

- EPA Environmental Noise Control Manual (1994). Chapter 171 refers to acceptable levels of noise emission above background levels depending on the length of the construction period. For activities which extend for periods of up to 6 months, an L10 level of 10 decibels (dB) above background (L90) is considered acceptable. For activities which extend for periods of over 6 months, the criterion of 5 dB above background is considered appropriate.
- Australian Standard (AS) 2436-1981 'Guide to noise control on construction, maintenance and demolition sites'. This standard outlines measures which can be implemented to control and minimise noise emissions on sites, including plant selection, siting, shielding and management approaches.
- EPA Environmental Criteria for Road Traffic Noise (1999). This guideline relates to the impact of additional traffic which will be generated as consequence of the demolition program. The number of truck movements is expected to be in the order of 40 to 50 per week, however the roads surrounding the site are frequently used by heavy vehicles servicing Port Kembla, and therefore the additional impacts from traffic will be minor. Further, these numbers of truck movements are significantly less than those which occurred during the operational phase of the PKC site.

4.4.2 Ambient Acoustic Environment

Port Kembla is an area of predominantly industrial character, dominated by a number of heavy industries. For approximately 100 years, the copper smelting and refining works on Military Road, now owned by PKC,

[1] Northern Territory Department of Natural Resources, Environment, The Arts and Sport. http://nt.gov.au/nreta/environment/waste/guidelines/pdf/guidecondemnoise.pdf, last accessed 23 February 2009.

has been one of the major features of the physical and economic environment of the area. Situated immediately alongside the business/commercial part of Port Kembla, and in close proximity to much of the residential area, the PKC complex has been a dominant influence on the livelihood and everyday lives of those living in the area. Since 2003 (when smelting and refining ceased) there has been little activity at the site, other than period care and maintenance programs. Prior to that, the works and its associated traffic, particularly truck movements to and from the Site, was a major contributor to the noise levels and general acoustic environment of this part of Port Kembla.

The nearest residences to the works are at a distance of approximately 30 m from the Site boundary (two houses near the northern end of Reservoir Street), but there are several houses within 200 m and many within 300 m of the boundary in the area to the south of the Site. To the west of the Site, properties along Military Road are mostly commercial or light industrial, and the next block towards the west is Wentworth Street, the main commercial and shopping precinct of Port Kembla. Beyond that to the west, the area is predominantly single block residential.

To the north and east of the Site, heavy industry dominates the landscape. A police station and court house are present near the corner of Military Road and Old Port Road (north west of the site), and alongside is a small hostel or similar. General noise levels in the areas surrounding the PKC works are primarily influenced by industrial works (principally the MM site, immediately east of PKC), road traffic (both nearby and distant), domestic and local commercial activity and other sounds such as that from birds, insects etc.

To develop an understanding of the nature of the existing acoustic environment of the area, snapshot 15 minute sound level measurements were taken at four nearby locations on 28 October 2008. The L90 is the noise level exceeded for 90% of the measurement period (in this case 15 mins) and is generally referred to as the background level. The L_{eq} (or continuous equivalent noise level) is an integrated average over the measurement period and is also used to characterise ambient noise conditions. These noise measurements showed that at the nearest residential receivers (in Reservoir St and Electrolytic St) background (L90) levels in the middle of the day are around 43 to 45 dBA. In other areas, such as at the pre-school adjoining the church at the corner of Military Road and Church Street, background (L90) levels were around 51 dBA due mostly to passing traffic and commercial activity. In other residential areas of Port Kembla such as Kembla Street, with little passing traffic, L90 levels were also around 44 dBA. The Leq measurements at those locations ranged from 60 to 63 dBA in the residential areas to 67 dBA in Church Street.

4.4.3 Noise Producing Activities

The demolition work will involve a variety of vehicles, plant and equipment operating in all areas of the Site over a total period of up to 16 months. Some of the main sources of noise and their expected maximum sound pressure levels are as follows:

Table 2 Expected equipment sound pressure levels

Hydraulic excavator	89 dBA at 7m
Excavator with rock-hammer	97 dBA at 7m
Bulldozer	89 dBA at 7m
Truck	85 dBA at 7m
Crane	80 dBA at 7m
Concrete crushing plant	88 dBA at 7m
Screening unit	92 dBA at 7m
Air compressor	61 dBA at 7m
Angle grinder	89 dBA at 7m
Electric saw	86 dBA at 7m
Hammering	95 dBA at 7m
Front end loader	85 dBA at 7m

These are mostly intermittent noise sources, though for part of the time, some will be operating on a semi-continuous basis, for example the concrete crushing plant, compressor, excavators, bulldozers and trucks. Where structures or building walls are allowed to fall to the ground, higher instantaneous noise levels could result, but these are expected to be occasional isolated events.

Trucking of materials off-site will take place over most of the period of demolition – this will include steelwork and other scrap metal, obsolete equipment, timber, glass, asbestos and possibly other minor hazardous materials. The number of truck movements associated with this activity is likely to average 40 to 50 movements per week, which is much less than when the plant was an operating smelter and refinery. It is expected that all concrete and brickwork will be treated on-site by the concrete crushing or recycling plant, which will be set up in the northern part of the site. The crushed product materials from this plant will be stockpiled temporarily then used to fill low-lying areas, depressions and cavities over the Site as part of the process of creating a relatively level surface suitable for re-development. It should be noted that it is intended to leave all floor slabs, roadways and other paved ground surfaces intact as far as possible and this will significantly reduce the amount of concrete crushing to be undertaken. The preliminary noise assessment has included the effects of the crusher's operation.

4.4.4 Mitigation & Management Issues

The mitigation and management of noise impacts will be an important part of the demolition programme. Measures that will be adopted include the following:

- 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: including the staging of demolition to take place from the north-east and moving towards the south-west of the site as long as possible;
- Silencing or treatment of equipment to reduce noise emissions;
- 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. It is noted that tonal alarms are considered necessary in terms of mitigating traffic related accidents on site;
- Hours of operation – including undertaking specific activities within set hours only; and
- Consultation and liaison with affected residents and businesses.

The hours of operation for demolition works are expected to be:

- 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.

It is intended to implement a programme of community consultation to keep local residents and businesses aware of demolition activities, and where specific activities may cause exceedances of acceptable noise levels at some locations, then 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. 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. They will be required to ensure that all employees and sub-contractors are aware of the importance of noise reduction and the need to implement control measures when required. Affected residents will be provided with contact details for on-site supervisory personnel, who will be required to maintain liaison with potentially noise affected parties.

4.4.5 Preliminary Noise Assessment

As discussed above, there will be a number of different and varied items of noise-producing equipment in use during the demolition works, most on an occasional or intermittent basis, but some will be operating at least partly on a semi-continuous basis for some periods and in certain areas of the Site. The assessment of overall noise impacts is therefore a complex exercise. To gain an understanding of the expected worst-case impacts that will affect the different noise sensitive receivers in proximity to the Site, estimates of predicted noise levels at those locations have been calculated, based on maximum noise emission levels from plant and equipment when operating closest to those specific receivers. These estimates do not include the effects of structures or walls falling to the ground as these will be isolated events, though with higher instantaneous noise levels. However, the isolated and occasional noise from demolished structures and sections of buildings falling to the ground is unlikely to be higher than the highest levels given (eg for hammering) in Table 2 on page 42.

Only a small number of residential premises, but a larger number of commercial premises, lie within 200 m of where the closest demolition activities will take place on the Site. However a significant number of residences lie within 300 m of the proposed works (these include houses in Kembla Street, Wentworth Road, Marne Street and Reservoir Street).

The worst affected houses are numbers 2 and 6 Reservoir Street, which are located about 150 m from the closest likely demolition works. Expected typical maximum (L10) noise levels which could occur at the various surrounding receivers are summarised in Table 3 below. It is important to recognise that these are worst-case noise predictions and noise levels occurring at those receiving locations will be much less for most of the period of demolition works.

Though the total period of demolition works is expected to be up to 16 months, the worst-case situation for any receiver would be for not more than a few months. Despite this, PKC will attempt to apply the criteria of background plus 5 dBA, undertaking all reasonable and practicable measures to achieve this noise criterion.

As discussed in Section 4.4.2 above, a series of background noise measurements have been taken for the site. These should be considered while considering that for those sensitive receiving locations given in Table 3, typical L10 noise levels from demolition activities are likely to be 8 to 10 dBA less than the worst-case predictions shown.

Table 3 Preliminary estimated worst-case maximum noise levels from demolition Works

Receiving locations	Min. distance from closest demolition work	Predicted worst – case L10 noise levels (dBA)	Current daytime background (L90) levels (dBA)	Comments
1) **Houses 2 & 6 Reservoir Street & Marne Street East**	150-200m	60	44-45	Assumes some shielding by existing noise bund
2) **Commercial premises in Military Road**	Up to 100m	66-70	52	Assumes only minor shielding by topography etc
3) **Commercial premises in Wentworth Road**	150-200m	60-66	50	Assumes some shielding by buildings on Military Road & topography
4) **Residences in Marne St, Reservoir St, Wentworth Rd, Kembla St.**	280-300m	50-57	44	Assumes some shielding by topography, bund and other buildings
5) **Police Station, Count House and Hostel on Old Port Road**	200m	60-66	52+ (estimated)	Assumes no shielding

From the information and preliminary noise estimates presented in Table 3 above, it is likely that some demolition activities in different parts of the Site may result in noise levels greater than the suggested criteria of background + 5 dBA at the nominated receivers. Where significant exceedances are likely to occur, consideration will be given to the use of portable acoustic barriers or screens to provide some noise reduction in these cases. This is in addition to consultation and liaison with potentially affected receivers to determine what management measures can be introduced to reduce noise disturbance. A noise management plan will be prepared to address the potential noise impacts and to determine what control measures are most appropriate to reduce noise impacts to acceptable levels. It will also include a noise monitoring programme which will involve regular noise monitoring (both attended and unattended) at a minimum of 4 locations along the site boundaries to:

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

Periodic logging of noise levels would be conducted at the unattended locations, whilst discrete monitoring would be conducted at attended 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 results of the monitoring would be reported on a monthly basis, including corrective actions implemented to address noisy activities.

An assessment of road traffic noise has not been made as estimates traffic volumes indicate an average of not more than 10 truck movements per day. However, truck and heavy vehicle access to the Site be via the Darcy Road entry, and the existing weigh-bridge and truck-wash bay at the northern end of the Site. This will reduce impacts associated with traffic issues 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. As discussed above, these predicted truck movement numbers are considerably less than those which applied when the PKC site was operational.

4.5 Noise and Vibration of 200m Stack

The 200m tall stack at the southern end of the site is proposed to be felled onto cleared area during the demolition program. This will be done by specialists using an explosive charge to fell the stack in a precisely controlled direction (generally to the north-east). The instantaneous noise level produced by the explosion is expected to be around 120 dBA close to the site, and therefore levels of around 95 to 100 dBA are likely at distances of about 400m from the stack.

The fall time for the stack, after initiation of the explosive charges would be 10 to 15 seconds and the noise from the stack falling and impacting with the ground is always lower than that of the explosion. Given these very short durations, the use of standard noise guidelines is not appropriate for this single event.

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
- ANZEC 1990 Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration recommends 5mm/s PVS

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 and vibration are not expected to cause harm to persons in areas where they are permitted to be at the time.

Dilapidation surveys of buildings and infrastructure 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. The procedure is outlined in more detail in Section 8.1 on page 66.

4.6 Biodiversity

A biodiversity study of the site focused on the Green and Golden Bell Frog, *Litoria aurea,* which is known to inhabit the Port Kembla area. Although many other threatened species of fauna are known to occur within 5 kilometres of the Subject Site (Port Kembla Copper) the Green and Golden Bell Frog (GGBF) is the only species considered in this assessment because the Subject Site is highly modified and considered unsuitable for other threatened species. No endangered ecological communities currently listed in the *Threatened*

Species Conservation Act (1995) were located within the areas to be disturbed. The potential impact on GGBF is also considered under the *Environment Protection and Biodiversity Conservation Act 1999*.

A study was undertaken by Gaia Research Pty Ltd. This firm has considerable experience in the area, including surveying and authoring a management plan in conjunction with the NSW Department of Environment and Climate Change (Assessment of Habitat, Dispersal Corridors and Management Actions to Conserve the Port Kembla Key Population of Green and Golden Bell Frog 2007-2008).

Targeted surveys were conducted at the project area in relation to a proposed demolition of the plant. The surveys did not include PKC-owned land which is not subject to this project application, although adjacent land may be utilised as part of the management measures. No GGBF were detected on the site during this survey. The project will not have a significant impact on the GGBF but adds to the cumulative loss of habitat for this species.

Two key management actions have been suggested which would ameliorate the project's impact. These are summarised below.

1. The modification of two detention basins that are designed for stormwater flow so that they retain a depth of water (circa 400 mm) to cater for the breeding requirements of the GGBF. It is expected that the detention basins would fill after heavy rain and retain water for several months to allow the GGBF tadpoles to mature and disperse.
2. The provision of emergent aquatic plats in tubs may facilitate the project's impacts by providing refuge habitat for GGBF adults and metamorphlings.

To ensure the management measures are appropriate and effective, PKC will develop a GGBF Management Plan in consultation with DECC. The plan will ensure that any potential conflict between provision of pollution controls and habitat protection are resolved. Where possible, PKC will employ salvaged materials for habitat creation, eg a modified tank.

The plan will ensure the habitat provided is suitable for both the demolition period, taking into account the nocturnal movements of frogs, and subsequently once the demolition is complete. Any permanent habitat as part of a future development of the site will be separately considered and subject to an additional project application.

PKC's commitments with regards to the protection of the GGBF are summarised in the Draft Statement of Commitments on page 68.

4.7 Waste

PKC will apply the relevant legislation, regulations, codes and standards concerning the management of construction and demolition (C&D) wastes for the decommissioning and demolition works at the site. The applicable legislative documents and acts are outlined in section 6.1.3.1 on page 59, below.

4.7.1 Types of Waste

Port Kembla Copper has already initiated detailed assessments of the types of wastes that will be generated from the works. These are:

- 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…)
- General rubbish

4.7.2 Classification of Wastes

PKC will assess the wastes that will be generated resulting from the decommissioning and demolition works 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).

4.7.2.1 General Solid Waste (Non-Putrescible)

As part of the waste minimisation and sustainability drive, general solid waste such as brick and concrete are anticipated to be used in the make-up of an engineered fill to backfill pits and sublevels (depressions left by the demolition of structures). These wastes (see Recycling below) may undergo validation or classification by laboratory testing where required to determine if their intended uses are within the environmental criteria for such materials. General solid wastes of this type will be environmentally classified as fit for use as on-site fill material; or if unsuitable for this purpose, disposed of at an off-site licensed facility in accordance with their classification.

4.7.2.2 Hazardous Waste

A site-specific hazardous substance and materials survey will be carried-out as part of the decommissioning process. A copy of the hazardous substance and materials survey report will be provided to the Contractor before demolition works. Hazardous substances and materials will be managed as part of the decommissioning process throughout the demolition works. All 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).

4.7.2.3 Special Waste

An asbestos register already exists for the site and will be used to direct an asbestos survey. As it is a statutory requirement, an asbestos survey will be conducted as part of the decommissioning process prior to the demolition works. A copy of this survey will be provided to the Contractor(s) before asbestos removal and demolition works commence. All identified special wastes 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).

4.7.2.4 *Liquid Wastes*

The presence of liquid chemicals is limited at the site and is expected to be nil (pipes, vessels, containers and tanks have already been purged and cleaned of chemical liquids). Chemicals that may be present at the site are 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 will be assessed in the hazardous substance and materials survey. All 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 and the Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008 (2008 No 109).

4.7.3 Estimate of Waste Quantities

The estimate of the quantities of wastes that will be generated from the decommissioning and demolition of buildings are summarised in Table 4 as follows.

Table 4 Waste types and quantities

Waste Type	Estimated Quantity	Potentially Recyclable (Yes / No)
Brick & Concrete	39 000 tonnes	**Yes**
Timber	50 tonnes	**Yes**
Plastic Panels	30 tonnes	**Yes**
Asbestos sheeting	8 317 m^2	**No**
Asbestos (other)	TBE	**No**
Hazardous Substances & Materials	TBE	**No**
Ferrous Metals		
- Rebar	1 500 tonnes	**Yes**
- Structural Steel	10-15 000 tonnes	**Yes**
Non-Ferrous Metals:		
- Galvanised metal cladding	300 tonnes	**Yes**
- Stainless steel	750 tonnes	**Yes**
- Other non-ferrous	1 000 tonnes	**Yes**
TOTALS (excluding asbestos other and hazardous substances)		**About 55 000 tonnes**

Source: URS Report 43167252; August 2005 and PKC data on ferrous and non-ferrous metals
Note: Quantities concerning asbestos (other) and other hazardous materials are to be established from dedicated surveys

4.7.4 Recycling

PKC will consider recycling waste streams produced by the demolition process where the intended use of recycled materials is assessed as fit for purpose from a material and environmental standpoint, including DECC guidelines, and does not have potential future risk or liability to PKC. Table 4 above outlines the types of materials that Port Kembla Copper can potentially recycle if they meet the applicable environmental requirements for the relevant materials. This initiative falls within the Waste Avoidance and Resource Recovery Act 2001 No 58. PKC will make an application for Recovered Construction and Demolition Waste Fines Exemption 2008 and conduct the necessary Compliance Assessment as per the Resource Recovery Guidelines for all recycled material recovered from construction and demolition wastes and as outlined in the following subsections.

4.7.4.1 *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. It is PKC's intention to infill these areas with an engineered fill that will meet future

construction requirements. Brick and concrete that meet the appropriate environmental criteria resulting from demolition activities 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 disposed of to landfill. A geotechnical assessment of this material will be conducted to define the specification of additional imported materials to be blended with these re-graded materials to meet the geotechnical specifications of the engineered fill.

4.7.4.2 *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 demonstrate their capacity and any licenses and accreditations that they may be obliged to have within the regulatory framework to 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.

4.7.5 Waste Receptors

Wastes that cannot be recycled will be disposed of to landfill or treated prior to landfilling where the case may be. The types of waste and their classification in accordance with the Waste Classification Guidelines (DECC, 2008) (via the means of laboratory testing where required) will ultimately determine their applicable disposal routes. These will be: General Solid Waste, Restricted Solid Waste, Hazardous Waste, Special Waste and Liquid Waste.

4.7.6 General Management of Waste

The handling, sorting and temporary on-site storage and transport of the waste streams will incorporate all the necessary procedures and systems as 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, where waste management items will figure on the agenda. A detailed Waste Management Plan is a pre-works submittal requirement of the demolition contractor. This plan will incorporate all the necessary and applicable legislation concerning waste management.

4.7.7 Modifications to the EPL

The current EPL includes the following annual waste allowances:

- Non-thermal treatment of hazardous and other waste - 0 - All; and
- Miscellaneous Licensed Discharge to Waters (at any time) - >1000 ML discharged.

The demolition works will see the removal of a certain amount of hazardous and special waste which is covered by the EPL. As outlined in Section 4.3 above, the discharge to waters is not likely to greatly exceed its current discharge level of 6 ML. In the event that it will exceed this limit, PKC will discuss a temporary variation to the EPL for the purposes of carrying out the demolition project.

It is therefore considered at this stage of the decommissioning and demolition works planning that a modification to the EPL will not be required.

4.7.8 DECC Resource Recovery Exemptions

The DECC has nominated exemptions to the normal resource recovery guidelines.

> *The Department of Environment and Climate Change (DECC) encourages the recovery of resources from waste where this is beneficial and does not harm the environment or human health. Many waste-derived materials are not suitable to apply to land or use in thermal applications due to potential contamination to the land or pollution from air emissions.*
>
> *On 28 April 2008, DECC introduced 'resource recovery exemptions' under clause 51 of the Protection of the Environment Operations (waste) Regulation 2005 to provide for the safe reuse of waste materials. DECC is now able to exempt the use of waste or waste-derived materials in certain circumstances where a material is assessed as being fit for its purpose.*
>
> *General exemptions have been developed by DECC with significant input from industry groups for commonly recovered materials. General exemptions can be used without notifying DECC provided the conditions of the exemption are met.*
>
> Source: Website www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm

The list of General Exemptions concerning the applicable wastes (potentially recyclable) that will be generated by the demolition works at the PKC site are summarised below.

4.7.8.1 Cement Fibre Board

It is possible that certain asbestos sheets have been replaced by cement fibre board over the site lifespan. The reuse of these materials requires laboratory testing as stipulated.

4.7.8.2 Excavated Natural Material

Excavated Natural Material (ENM) may be produced by the excavation of concrete structures, slabs and foundations. These soils will remain on site.

4.7.8.3 Recovered Aggregate

Crushed and re-graded brick and concrete will be retained on-site to constitute and aggregate in engineered fill. It may also be recycled off-site for future use as road base or other authorised use. It is understood that refractory brick cannot be used for this purpose. The reuse of these materials requires laboratory testing as stipulated.

4.7.8.4 Recovered Fines from Construction and Demolition Waste

Soil or sand substitute with a maximum particle size of 9.5 mm that is derived from the processing of mixed construction and demolition waste including residues from the processing of skip bin waste may be recycled under the exemption. These materials will be retained on-site to constitute engineered fill. The reuse of these materials requires laboratory testing as stipulated.

4.8 Traffic

4.8.1 Truck movements generated

The traffic impacts from the project will be minimal due to their temporary nature. The project will progress in different stages, however the number of movements will remain significantly below the previously licensed limit at all times. This is in contrast to the transport volumes currently permitted.

The primary requirement for traffic generation is to transport waste materials offsite. The following assessment considers these movements, as well as the movements required to move the demolition equipment onto the site. It should be noted, however, that the truck movements required to move the equipment are one-off events and as such an average hourly estimation would not be appropriate.

It is expected that a large proportion of the waste generated will be recycled and used on-site. This will significantly decrease the truck movements required. The table below shows a comparison between currently permitted and required movements for the project, assuming that only half of the concrete and bricks estimated are recycled onsite. This, therefore, represents a very conservative estimate. Disposal and/or recycling of any material from the site will be in accordance with DECC's Resource Recovery Guidelines.

Table 5 Heavy traffic generating activities

Product	Tonnes trucked into and out of site	Estimated truck movements per day	Duration of truck generating activities
During operation phase of site			
Concentrate	340 000	81	Every day, year-round, during previous operation of site
Slag	120 000	36	
Other*	30 000	9	
Proposed for this project			
Waste	NA	< 1	15 month period only
Demolition equipment	NA	< 1	2 month period only

* Including gypsum, coal, sand, limestone, diesel

As with the current consent, entry and exit to the site by heavy vehicles will be via Darcy Road only.

Traffic generating activities of the project will be relating to transport of:

- Demolition equipment, such as heavy portable machinery, onto the site, which is not a licensable activity;
- Waste or recycled material from the site to external users; and
- Employees and contractors.

The number of truck movements will vary significantly depending on several key factors:

- The weight of demolition equipment, which will be specified in the Demolition Management Plan;
- The volume of material on site, which can only be roughly estimated;
- 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 backloaded to minimise the number of movements.

The number of truck movements resulting from this project will be temporary in nature. Any long-term trucking requirements are not relevant to this project application, and will be detailed as part of any future project application for the site.

4.8.2 Stack Demolition Event

The traffic management strategy for the single stack demolition event will also be detailed in the DMP.

As outlined in Section 3.2.4 on page 25, the roads within the exclusion 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 exclusion zone. This will be determined as part of the DMP, and will ensure that there are no persons present within at least a 200 metre radius of the base of the stack. Figure 6 on page 16 gives the relative distances from 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.

The Wollongong City Council and local residents and businesses will be advised of the work in writing at least two months prior to the date of the road closures. Approximately two weeks from the date of the closure, stakeholders will be contacted again either in person or via telephone. Prior to any activities being undertaken which may be potentially harmful to nearby people,

Appropriate warning and detour signage will be used, diverting onto roads capable of carrying the expected heavy traffic from Darcy Road.

4.9 Hazard and Safety

Hazards were considered as part of the Environmental Risk Assessment. Their management has been further considered as part of this EA.

The risks relating to the project are significantly diminished due to the fact that it is of a short-term, one-off nature. There are therefore no operational risks, only those relating to the demolition of existing structures. Any future development of the site would necessarily consider broader implications relating to the use of the site.

The risks are only of an environmental and occupational risk nature.

The two main potential hazards relating to the project are:

- Residual process chemicals currently enclosed in process equipment contaminating air or water, and
- Safety of employees and nearby residents relating to the demolition of the 200m stack.

There are no dangerous goods stored on site, and the Dangerous Goods Licence with NSW WorkCover is in the process of being repealed.

Transport of equipment or scrap to or from the site will be covered by the Traffic Management Plan, which will address detailed management actions.

4.9.1 Environmental Hazard

Detail on a job-specific basis will be prepared for each task in the demolition, and will be recorded in the following key documents:

- Asbestos Removal Control Plan (ARCP)
- Hazardous Materials Removal Control Plan (HMRCP)

These documents form part of the Draft Statement of Commitments by PKC (Section 8 on page 66), and will be available to relevant government agencies on request.

4.9.1.1 Process chemicals

When the copper smelter and refinery were decommissioned in 2003, the processes were run down gradually to minimise the amount of product which remained in the equipment. This means that there are only trace amounts of process chemicals remaining, requiring minimal management.

The hazard pertains to the acid plant contact towers, which will contain some small amount of residual acid. This reacts with water in an exothermic reaction, which has the potential for generation of acid mist.

The main management techniques for mitigating this hazard are:

- Prepare a Job Safety and Hazard Analysis for the work, and refer to the relevant management plans
- Identify which elements of the acid plant contain residual acid
- If required, carefully dismantle elements of the acid plant
- Ensure working order of drainage system downstream
- Ensure water treatment plant is operational and has the required capacity to treat the flush water
- Flush acid with large volumes of excess water

The flush water will be treated in the water treatment plant, and discharged according to the Environmental Protection Licence.

4.9.1.2 Asbestos Containing Materials

Given the site's long operating history, several of the buildings contain asbestos building materials. These have been continually removed from the site during its recent history. An Asbestos Register for the site is in operation on the site. This is summarised in Table 6 below.

Table 6 Asbestos Containing Materials and their status

Building	Type of Material	Status
Small garage behind laboratory	• Asbestos cement sheeting	Previously removed by licensed contractor
Large garage near laboratory	• Asbestos cement sheeting • Fibro asbestos	Previously removed by licensed contractor
Engineering store	• Asbestos cement corrugated • Fibro asbestos	Previously removed by licensed contractor
Refinery maintenance workshop	• Asbestos cement sheeting • Fibro asbestos	Some damaged sections removed – will be removed by licensed contractor
Lead burners and plumbers	• Asbestos cement sheeting • Fibro asbestos	Some damaged sections removed – will be removed by licensed contractor
Tankhouse / refinery	• Asbestos cement sheeting • Asbestos cement corrugated roofing	Intact – will be removed by licensed contractor
Research department	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Watchman's building / canteen	• Asbestos cement sheeting • Fibro asbestos	Intact – will be removed by licensed contractor
Carpenters shop	• Asbestos cement sheeting • Fibro asbestos	Intact – will be removed by licensed contractor

Building	Type of Material	Status
Nickel plant	• Asbestos cement sheeting • Fibro asbestos	Intact – will be removed by licensed contractor
Silver mill	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Toilet block NE of Tankhouse	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Scrap shedding building	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Weighbridge office	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Fuel store	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Main store	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Transport shed	• Asbestos cement sheeting	Intact – will be removed by licensed contractor
Former fume process shed	• Asbestos cement sheeting	Intact – will be removed by licensed contractor

In addition to the Asbestos Removal Control Plan, the asbestos removal contractor is to be prepared to comply with all current Commonwealth, State and local requirements, procedures and guidelines for the removal of asbestos. This includes, but is not limited to, the New South Wales Occupational Health & Safety Act 2000, the New South Wales Occupational Health & Safety Regulation 2001; the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)], the Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC: 2002 (2005)] (the "Code of Practice"), WorkCover demolition notification and licensing requirements, WorkCover awareness training, respiratory and other personal protection, personal exposure monitoring, showering facilities, and medical surveillance.

The Asbestos Removal Control Plan will include:

- Identification of the (asbestos containing material) ACM to be removed
- Consultation
- Assigned responsibilities for the removal of ACM
- Program of commencement and completion dates
- Emergency plans
- Asbestos removal boundaries
- Control of electrical and lighting installations
- Anticipated asbestos in air levels during removal works
- Details of the air monitoring program
- Personal protective equipment and respiratory protective equipment
- Waste storage and disposal program
- Methods for removal of ACM
- Asbestos removal equipment
- Details on required enclosures, smoke testing and the location of negative pressure exhaust units
- Details on temporary buildings required (e.g. decontamination units)
- Other control measures
- Procedures for workplace decontamination, decontamination of tools and equipment, personal decontamination and decontamination of non-disposable PPE and RPE
- Waste disposal

As indicated previously in Section 5.6, a detailed hazardous materials survey (including asbestos) will be conducted prior to demolition such that the demolition contractor has a detailed understanding of the types, locations and amounts of hazardous materials requiring management as part of the demolition.

4.9.2 Occupational Health and Safety Hazard

The demolition of the main 200m stack presents some potential hazards requiring management to staff and neighbouring residences and businesses.

PKC will work with the specialist stack demolition contractor once appointed to prepare the management plan for this aspect of work. The plan will define all activities relating to the stack demolition, and will link in with the Works Health and Safety Management Plan listed in section 8.4 on page 68. The Plan will incorporate all applicable safety provisions in the Occupational Health and Safety Act 2000, and any other relevant regulations or codes of practice.

Management measures for off-site and on-site safety will include:

- The preparation of Job Safety and Environment Analyses, Safe Work Methods Statement or equivalent for each section of work (including the demolition of the stack) to identify potential risks and ensure correct and safe work practices are employed at all times
- The establishment of an exclusion zone during the time required to demolish the stack which will eliminate the risk of falling objects striking people
- The contractor will hold:
  a) Current Workers Compensation, Professional Indemnity & Public Liability Insurance Certificates
  b) Copies of all relevant licenses and certificates for the Works, such as (but not limited to) Unrestricted Demolition Licence, Copies of Unrestricted Demolition diplomas for the key site staff and Contractor's Project manager; Construction Industry OHS Induction Cards (Commonwealth White Card or State Green Card) for all employees performing Work at the site.
- The testing and tagging of all electrical equipment to be brought on-site as per Australian Standards
- If chemicals are to be brought on-site, Material Safety Data Sheets (MSDS) must be provided for all chemicals. MSDSs must be compliant with Australian legislative requirements.
- The establishment of a Site Induction Process, outlining the HSE hazards and controls.
- Description of the establishment of the exclusion zone, which would involve evacuation of residences and businesses for a brief period of time (in the order of 4 hours), and closure of necessary roads
- Provision of security to maintain the exclusion zone, in consultation with relevant agencies, which may include police
- Contingency plans, in consultation with emergency services providers, such as SES, fire and ambulance
- Description of on-site safety measures, including:
  a) Minimum requirements for personnel qualifications and experience
  b) Use of explosives according to relevant standards and guidelines
  c) Timing of the blast and notification of relevant stakeholders

Specific environmental management measures to address noise and dust will also form part of this plan.

4.10 Heritage

4.10.1 Non-Aboriginal

There are two items in the project area which are of heritage value:

1) The Electrolytic Refining and Smelting Company assay office
2) The silver mill stack

The assay office was listed as a heritage item with the Heritage Branch of the NSW Department of Planning in 2000. It is also listed in the Wollongong Local Environment Plan.

The Statement of Significance is:

> *The Assay office of the first industry to be built at Port Kembla. This building represents early technological and industrial development of Wollongong.*[2]

The listing also states that the building is of brick construction with a corrugated metal roof, and that it should be retained for "appropriate use". The building was used up to 2004 as an office.

The silver mill stack is likely to have been built prior to 1930. It is of brick construction, with decoration. It was used as a stack up until the 1970s.

While the silver mill stack it is not listed with the Heritage Branch, it is also an example of the industrial heritage of the area.

PKC will protect these items during demolition so they are not disturbed. They will also be specified on relevant documentation as part of a change of site ownership so as they may continue to be preserved during the site's future use.

4.10.2 Aboriginal

The whole PKC site is highly disturbed for industrial use since at least 1908 when it was first developed as a copper smelter and refinery. There is therefore no possibility that any sites of Aboriginal significance remain are present in the project area.

[2] http://www.heritage.nsw.gov.au/07_subnav_01_2.cfm?itemid=2700582, last accessed 5 December 2008.

5 Demolition Management Plan

The DMP will be separately prepared and submitted. The DMP will outline the management of the activities to minimise potential impacts on the surrounding environment. The DMP will be drafted with guidance from the methodology outlined in the Australian Standard AS2601:2001 *The Demolition of Structures* and in accordance with any requirements from the DoP. It will include techniques and methodology, scope of works, a schedule of demolition phases, hazardous material register, traffic management, the environmental objectives and actions and the safety, emergency and contingency plans for the proposed demolition works.

In particular, the DMP will outline the key procedures associated with the demolition works including hazardous material removal, material handling strategy and waste management. In addition, control measures for potential environmental impacts will be examined and addressed in the DMP. This will include dust, stormwater management, noise and vibration and traffic.

The DMP will be prepared separately from the EA.

6 Statutory Framework

PKC's proposed demolition works at Port Kembla require planning approval in accordance with NSW planning legislation. The Environmental Planning and Assessment Act 1979 (EPA Act) which is administered by the NSW Department of Planning (DoP) is the key legislation. Planning approval is also required to take into consideration any applicable State Environmental Planning Policies (SEPPs), and the development cannot be prohibited by any applicable regional environmental plan (REP) or local environmental plan (LEP). In addition to state planning and environmental legislation, PKC's approval will have to comply with applicable commonwealth environmental legislation.

Environmental protection in NSW is dealt with by the Protection of the Environment Operations Act 1997 (the POEO Act), which is administered by the Department of Environment and Climate Change (DECC). The proposed works must also be considered with regard to this Act.

6.1 State Legislation

6.1.1 Environmental Planning and Assessment Act 1979

PKC's proposed demolition works have been declared by the Minister for Planning to be a project of state environmental planning significance. Therefore Part 3A of the EPA Act will apply which specifies that the Minister for Planning will be the consent authority for the proposed works.

Under Part 3A of the EPA Act an application for development approval is to be lodged with the Director-General (Section 75E). This lodgement is to include an Environmental Assessment (EA) for which requirements are to be requested from, and provided by, the Director-General.

In addition, Part 3A of the EPA Act provides that the development and environmental assessment processes under Part 4 and Part 5 of the Act do not apply in respect of an approved project. Further, under Part 3A environmental planning instruments (other than SEPPs) do not apply to an approved project. However, the project cannot be approved if the development is prohibited under any environmental planning instrument.

6.1.2 Environmental Planning and Assessment Regulation 2000

The EPA Regulation provides further detail on the process to obtain development consent. This includes statutory timeframes, information to be made available to the public and applicable fees and charges. As the proposed project is subject to the provisions of the EPA Act, the EPA Regulation applies.

6.1.3 Protection of the Environment Operations Act 1997

The POEO Act is the key piece of environmental protection legislation in NSW and is administered by the DECC. The objective of the POEO Act is to protect the quality of the environment in NSW. The proposed demolition works will be carefully assessed to minimise or eliminate the risk of potential impacts to the surrounding environment.

As well, whilst not currently an operating facility, PKC has a current Environment Protection Licence under the POEO Act to authorise the carrying out of waste activities at the Port Kembla premises. Upon completion of the demolition works, this Licence will be reviewed. The waste section of the Licence will no longer be required as there will be no waste generation undertaken on the site, and the wastewater section will be reviewed. The wastewater (which, post-demolition, will consist solely of surface runoff) will continue to be

monitored and, if it can be demonstrated that any discharged from the site following demolition will not cause pollution of waters, PKC will apply to have the Licence revoked.

6.1.3.1 Regulations

The legislative framework concerning the management of waste in NSW is outlined in the *Protection of the Environment Operations Act 1997 No 156* and associated regulations.

The *Protection of the Environment Operations (Waste) Regulation 2005* includes certain Parts which will be of particular relevance to the waste management for the decommissioning and demolition of the Port Kembla Copper Smelter and Refining Facility, these are:

- Part 3: Waste tracking requirements.
- Part 4: Management of special wastes.
- Part 5A: Waste performance improvement scheme.
- Part 6: Miscellaneous (where relevant).

The *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008*; under the Protection of the Environment Operations Act 1997, also contains certain divisions that are applicable to the waste management for the decommissioning and demolition of the Port Kembla Copper Smelter and Refining Facility.

NSW DECC *Waste Classification Guidelines, 2008* will be consulted to itemise, to the extent practicable, the different types of wastes that will result from the decommissioning and demolition activities and classify them. These wastes will include asbestos and other hazardous substances specific to the site.

Recycling of wastes will be in accordance with the hierarchy in the *Waste Avoidance and Resource Recovery Act 2001 No 58*. Port Kembla Copper will carry out its obligations concerning, the stripping, removal, handling, staging, stockpiling, loading, transportation, disposal, recycling and resale of the wastes generated from the works.

The *Occupational Health & Safety Regulations 2001* and other relevant codes and standards relating to the management and handling of wastes, including asbestos and other hazardous wastes will be inherently built into the Waste Management Plan to be prepared by the demolition contractor prior to the commencement of demolition works.

6.1.4 Occupational Health and Safety Act 2000

The OHS Act aims to protect the health, safety and welfare of people at work. PKC will ensure procedures for the safe handling, storage and transport of the materials generated from the works at the Port Kembla site are implemented and the works comply with the OHS Act.

6.1.5 Occupational Health and Safety Regulation 2001

The OHS Regulation supports the OHS Act in achieving reductions in the incidence of workplace injuries and is applicable to all places of work. The regulation specifies that employers must identify and control all hazards to health and safety in the work place.

6.2 State Environmental Planning Policies

SEPPs are legislative environmental planning instruments administered under the EPA Act. SEPPs deal with issues considered to be significant to the state and people of NSW. The SEPPs applicable to PKC's proposed works include:

- Major Projects SEPP;
- SEPP 55 – *Remediation of Land*, and
- SEPP 33 – *Hazardous and Offensive Development*.

6.2.1 SEPP (Major Projects) 2005

The SEPP (Major Projects) 2005 defines developments that are considered to be Major Projects and for which Part 3A of the EPA Act applies. PKC's proposed works are not specifically listed under the SEPP (Major Projects) 2005 at this time, however the project has been declared as a project of state significant development by the Minister for Planning. The "Three Ports State Significant Site Proposal" by the NSW Department of Planning proposes to designate the Port Kembla area as a site of state significance under the SEPP.

6.2.2 SEPP 55 – Remediation of Land

The SEPP 55 states that land must not be developed if it is unsuitable for a proposed use due to contamination. The Port Kembla site was port related land prior to development of the existing facility. A Voluntary Remediation Agreement (VRA) (No. 26027) was carried out to address contamination present at the site, and a notice of satisfactory completion and a notice to end the remediation declaration were received on 11 July 2007. Upon the completion of the VRA, the contamination at the site was considered not to pose a significant risk of harm. The demolition project will be carried out cognisant of the prior contamination issues, so it is therefore suitable.

6.2.3 SEPP 33 – Hazardous and Offensive Development

The development has been screened for applicability of SEPP 33. This SEPP does not apply to the project as it fails the first test: the development is for demolition, not for industry or storage.

6.3 Regional Environmental Plans

REPs are legislative environmental planning instruments made under the EPA Act. REPs deal with issues such as urban growth, commercial centres, extractive industries, recreational needs, rural lands and heritage and conservation. Projects approved under Part 3A of the EPA Act are not substantially governed by REPs; however a project cannot be approved under Part 3A if the development is prohibited by an applicable REP. There are no REPs applicable to PKC's proposed works.

6.4 Local Environmental Plans

LEPs are legislative environmental planning instruments administered under the EPA Act. LEPs are prepared by local Councils and guide planning decisions for local government areas (LGAs). Similarly to the REPs, a project approved under Part 3A of the EPA Act is not substantially governed by LEPs. However, the relevant LEPs should be taken into consideration in an application for development consent as a project cannot be approved under Part 3A if it is prohibited by an applicable LEP. PKC's existing facility is located within Wollongong City Council LGA. The applicable LEP is the Wollongong Local Environmental Plan 1990.

6.4.1 Wollongong Local Environmental Plan 1990

The Wollongong LEP 1990 provides a framework to control and guide land use and development within the Wollongong LGA. The Wollongong LEP outlines the objectives and relevant development controls of each Zone of land. The proposed project is not prohibited under the Wollongong LEP.

The aim of the LEP is to provide a framework for land use management in the City of Wollongong to ensure that land is appropriately managed and developed and the environment and community are protected. The proposed demolition works are consistent with this aim and objectives, as the project will not detrimentally affect the local community or environment, but rather the community will benefit from the proposed works. After the works are complete, the value of the large PKC site for industrial use will be able to be realised, and the community will gain from the expected flow on effect of improved employment opportunities in the area.

The existing PKC facility is located within Zone 4(b) (Heavy Industrial). The objectives of this zoning are:

> *(a) to provide suitable areas for those industrial enterprises that should be kept well away from residential neighbourhoods;*
>
> *(b) to make the best use of public utilities and infrastructure required by substantial enterprises; and*
>
> *(c) to allow some diversity of activities that will not prejudice achievement of the objectives referred to in paragraphs (a) and (b) or significantly detract from the operation of existing or proposed industrial enterprises.*

The proposed demolition works are consistent with these zoning objectives.

6.5 Development Control Plans

Local Councils also prepare development control plans (DCPs) that provide more specific and comprehensive guidelines for development proposals. DCPs do not apply to a project approved under Part 3A of the EPA Act. However PKC recognises DCPs reflect local concerns and issues and accordingly has reviewed the proposed development in the light of one particular DCP: the Geotechnical Development Control Plan.

6.5.1 Geotechnical Development Control Plan

The Geotechnical Development Control Plan aims to minimise the risk of inappropriate development of sites in the Wollongong Local Government area which may be subject to slope instability. The site is not located in an area conducive to slope instability, therefore the DCP does not apply.

6.6 Commonwealth Legislation

The relevant commonwealth planning and environmental legislation is the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).*

There are three triggers under the EPBC Act whereby a Commonwealth Environmental Impact Assessment (EIA) may be required. These include actions that would or are likely to have a significant impact on matters of national environmental significance, actions that would or are likely to have a significant impact on commonwealth land and actions by the commonwealth or its agencies that would or are likely to have a significant impact on the environment inside or outside Australia. Matters of national environmental significance include World Heritage properties, RAMSAR wetlands, threatened species or ecological

communities listed in the EPBC Act, migratory species listed in the EPBC Act, the environment in a Commonwealth marine area and nuclear actions.

PKC's proposed demolition works at Port Kembla does not fall into any category that would require an EIA. Therefore, the statutory requirements outlined in EPBC Act have not been considered further.

7 Project Consultation

Extensive consultation has been undertaken regarding the project. A briefing note was used in discussions with consulted parties, and this is appended.

In summary, the balance of feedback was positive, with most parties welcoming an opportunity to make productive use of the site. The NSW Minister for Illawarra, The Hon David Campbell, was pleased to support the project and job creating development of the site.

Further consultation will take place with the stakeholders regarding the project in general, and targeted communications will be held with property holders who will be affected by the Exclusion Zone during the demolition of the 200m stack. Procedures for these communications are outlined in Sections 8.1 on page 66 and 4.8 on page 50.

Results of initial project consultation with specific stakeholders is summarised below.

7.1 Landholders and Community

Landholders were encouraged at the prospect of employment generation at the site. The main concern was relating to environmental issues, and in particular, air emissions. The balance of consultation was in favour of the project.

A special Community Liaison Group (CLG) Meeting was held at the Port Kembla Copper site on 26 November 2008, and a number of other local parties were consulted directly, using the appended Briefing Note.

The CLG participants were:

- Curtis Gregory, Illawarra Public Health Unit
- Hakoum Shalak, Illawarra Public Health Unit
- Bernadette Cooper, St Patrick's School Principal
- Leanie Payne, Port Kembla Primary School
- Olive Rodwell, Resident
- Bruce Medcalf, Resident
- Denis Norton, Illawarra Springs

Apologies:

- Wayne Phillips, Australian Workers Union Organiser
- Peter Bloem, DECC, Acting Regional Manager

7.2 Local Businesses and Service Providers

A large number of local businesses have been consulted about the project. These include all businesses which would be affected by the exclusion zone during the demolition of the 200m stack. The businesses consulted were pleased to be informed of the project. The feedback related to ongoing provision of information, potential for interruption of business activities, and concerns regarding contaminated dust. PKC has committed to ongoing consultation with affected businesses.

The businesses consulted were:

- Metal Manufactures, Gloucester Boulevard, Port Kembla
- Yes Smash Repairs, 71 Military Road, Port Kembla

- Ecowise Environmental, 73 Military Road, Port Kembla
- Pet Select Animal Supplies, 53-55 Military Road, Port Kembla
- Illawarra Springs Pty Ltd, 57 Military Road, Port Kembla
- Port Kembla RSL, Military Rd, Port Kembla
- Port Kembla Court House
- Port Kembla Police Station, Military Rd, Port Kembla
- Orica, Foreshore Rd, Port Kembla
- Brick and Block, Foreshore Rd, Port Kembla
- Morgan Cement international, 7 Foreshore Rd, Port Kembla
- Port Kembla Preschool, Cnr Church & Military Rd, Port Kembla
- Jimmy's Smash Repairs, Military Rd, Port Kembla
- Galley Cafe, Church St, Port Kembla
- Tosti Cellars, Wentworth St, Port Kembla
- Romeos Ristorante & Bar, Wentworth St, Port Kembla
- Duck Print Fine Art Limited Editions, Wentworth St, Port Kembla
- Falcone Bakery, Military Rd, Port Kembla

7.3 Department of Environment and Climate Change

PKC has an ongoing relationship with the DECC as a result of its environmental obligations. The DECC was a referral agency for this project, and as such, provided detailed input into the Department of Planning's development of the requirements for this Environmental Assessment.

A meeting was held on the PKC site on 7 October 2008 in which the Acting Regional Manager, Peter Bloem, was able to see the improvements made to the site and specify any requirements for the project. These have all been addressed as part of this EA.

A representative from DECC is a regular invitee to the Community Liaison Group. The representative did not see a need to attend the last meeting, given the regular correspondence with PKC.

PKC will continue to liaise with the DECC as the project progresses.

7.4 Wollongong City Council

A meeting was held with the General Manager, Director Planning and Environment, Manager Commercial Projects and Property, and Acting Manager City Planning. No particular comments were raised at this stage. PKC will continue to consult with the Council, especially where relevant to the development of suitable management plans for the project.

7.5 Roads and Traffic Authority

The RTA provided feedback on the project after the EA Requirements were set by the Department of Planning. The RTA has advised that they require no further consultation at this stage of the project.

7.6 Department of Water and Energy

PKC has been advised by DWE that it is satisfied with the EA Requirements, and that it does not wish to meet with PKC at this stage.

7.7 Port Kembla Port Corporation

The PKPC is not a government agency, and is therefore not a formal referral agency for this project. PKPC provided comment to the Department of Planning on the project, which was concerned with pollution in the harbour, which is not relevant to this project. PKC will continue to liaise with PKPC as the project progresses.

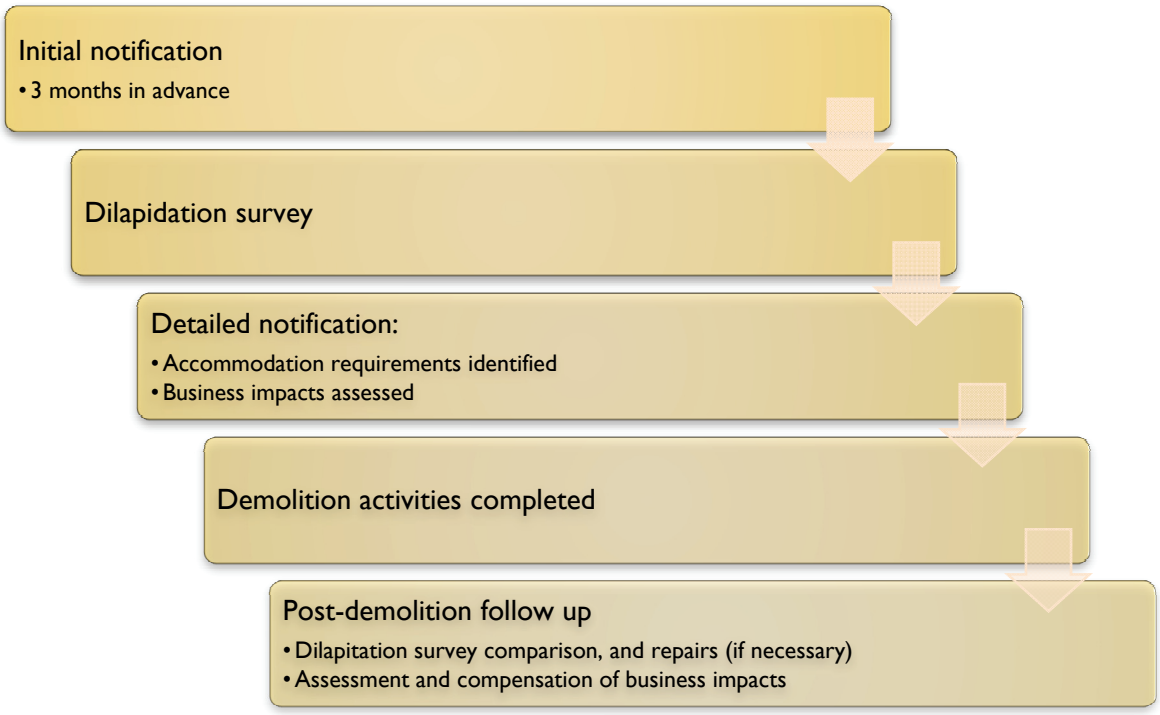
8 Draft Statement of Commitments

8.1 Community Notification

8.1.1 Properties affected by exclusion zone evacuation

The project will introduce a very small risk that properties surrounding the site may become damaged as a result of the demolition activities on the PKC site, and in particular, during the blasting and demolition of the 200m stack. As a result, PKC will engage fully with the community to ensure this risk is mitigated.

The process PKC plans to follow is summarised in the following diagram.



Further detail follows.

8.1.1.1 "Make good" provision

The primary aspect of this liaison will be to inform the potentially affected properties, that is, those within the exclusion zone, of the timing and likely effects of the project and PKC's "make good" provision.

At least two months prior to the commencement of any demolition activities, PKC will inform the property holders within the exclusion zone of the project timing. A copy of this Environmental Assessment will be available to them upon request

At this time, the property holders will be advised that PKC will "make good" any damage to their property which is demonstrably linked to the project. To be eligible for this provision, PKC will arrange for a dilapidation survey to be undertaken to establish the original (ie pre-demolition) condition of any improvements.

The dilapidation survey will entail engaging a suitably qualified and experienced contractor to perform a survey of properties within the exclusion zone, which will detail both verbally and photographically the physical condition of those properties. The survey will include both internal and external features, including

walls, ceilings, roof and any visible structural members. This report will be made available to the property holder and the Wollongong City Council.

Once the details of the demolition are known, further correspondence will be entered into to confirm the timing and duration of the evacuation.

Once the project is completed, a follow up survey will be undertaken which will compare the condition of the property to the original condition surveyed. If any damage is identified, PKC will work with the property holder to rectify the damage.

8.1.1.2 Mitigation of impacts

During the period of evacuation of the exclusion zone, residents will be provided with alternative accommodation. The details of this accommodation will be discussed with individual parties at the time that details of the demolition are known.

PKC recognises that the businesses within or near the exclusion zone may suffer material impact as a result of road closures. At the time of the detailed notification of demolition activities, PKC will discuss potential business impacts (such as loss of revenue) with business owners. Where material impact can be quantified, PKC will compensate those businesses of their direct losses.

8.1.2 Events Generating Offsite Impacts

Prior to the commencement of any activity which are assessed to generate impacts greater than those recommended in statutory guidelines, PKC will notify potentially affected property holders. Notification will take place at least one week prior to that particular activity. Where a series of activities with impact are planned to take place over a short period, eg one or two weeks, a single notification covering that period will be provided.

This notification is above and beyond the notification of the stack demolition event to the properties within the exclusion zone, and also additional to the general project community consultation which will take place before and throughout the demolition activities.

8.2 Community Feedback on Environmental Performance

PKC has a Community Liaison Group which has members from the local community, schools, businesses and regulatory agencies. The CLG will continue to meet at a frequency deemed appropriate by the stakeholders. New expressions of interest will be sought from interested stakeholders.

PKC also has a community email address and phone number, of which the community will be advised. Members of the community will be able to advise PKC of any potential environmental issues so that they may be addressed by the company.

8.3 Hours of Operation

All significant noise-generating demolition work will be undertaken between the hours of 7.00 am to 6.00 pm Monday to Friday, and 8.00 am and 1.00 pm on Saturdays. No work will be undertaken on Sundays or Public Holidays. Work which does not generate offsite impacts, such as maintenance, or work carried out within enclosed structures, may be undertaken outside these hours.

8.4 Management Plans

Prior to the commencement of works, PKC will prepare and make available to the Departments of Planning and Environment and Climate Change a number of management plans. These will include the following:

1. Demolition Environmental Management Plan (DEMP). The DEMP is to include as a minimum:
    a. Heritage Listed Structures Protection – to include a list of all buildings and structures that are heritage listed and be retained and protected (not demolished or damaged)
    b. General Demolition Management
    c. General Waste Management
    d. Air Quality (notably, dust)
    e. Water Quality & Storm water Management
    f. Noise and Vibration
    g. Traffic Management Plan
    h. Decommissioning and Decontamination Spill Control Plan
    i. Demolition Staging, Stockpiling, Recycling
2. Works Health & Safety Management Plan, which will incorporate all applicable safety provisions in the Occupational Health and Safety Act 2000, and any other relevant regulations or codes of practice
3. Asbestos Removal Control Plan (ARCP)
4. Hazardous Materials Removal Control Plan (HMRCP)
5. Electrical & Communications Utilities Decommissioning Plan
6. Fluids Infrastructure Decommissioning & Management Plan (gas, industrial wastewater, sanitary waste water, storm water and potable water)
7. Preliminary Decommissioning & Demolition Works Plan:
    a. The order of demolition (to be advised by PKC)
    b. The type (building structure and fabric) and content of structures to be demolished
    c. Building fabric to be reserved for re-grading for use as structural fill
    d. Safe Work Method Statements (SWMS) for each Site Work Area
8. Demolition Waste Management Plan, including:
    a. Identification of estimated volumes/tonnages and handling
    b. Hoarding, staging and loading
    c. Transport and intended disposal / recycling routes for all types of wastes that will be encountered
9. Ferrous & Non-ferrous Scrap Metal Inventory for each Work Area that describes the type, condition and estimated quantity of metals present
10. Green and Golden Bell Frog Management Plan (see Section 8.5 below)

All works will be carried out in accordance with the management plans.

8.5 Endangered Species

PKC is aware that the Port Kembla area is one of the few remaining habitats of the endangered Green and Gold Bell Frog (GGBF). PKC commits to working with DECC and a suitably qualified and experienced specialist to develop a GGBF Management Plan. This will ensure the provision of suitable habitat and inter-site corridors both during and after the demolition project.

8.6 Change of Ownership Provisions

In the event that PKC sells the project site to a third party, it will ensure that a future owner is aware of the unique requirements of the site pertaining to public interest. These are that the site's remediation must be upheld, and that the two structures with heritage value will be retained.

8.6.1 Maintenance of Remediation

1. Make any future owner of the site aware of previous soil and groundwater contamination
2. Include in the contract of sale or associated documentation a requirement that a future owner protects the remediation carried out to date, and continues to uphold any requirements of the DECC in relation to monitoring and future remediation which may be required

8.6.2 Maintenance of Heritage Structures

Any future owner of the site will be contractually required to retain both the ER & S Assay Office and the Silver Mill Stack.

8.7 Management of Contaminated Materials

1. No contaminated materials will remain on site after demolition.
2. Any contaminated material will be treated appropriately before leaving site for approved disposal.
3. PKC will ensure all occupational and community health matters are managed in the DMP and associated management plans according to regulations.

9 Conclusion

9.1 Economic Justification

The project site is currently under care and maintenance. This means that it is not generating any return to its owners, and is costing approximately $2.5 million per year in costs relating to compliance with environmental directives, and skeleton security, administration and maintenance staff.

The site is highly valuable for employment-generating industrial land. Major port, rail and road infrastructure is in close proximity, as is gas, electricity, water and wastewater. The site has been identified as strategically important to the State of NSW in a recent report: *Three Ports State Significant Site Proposal*[3]. It has high value earning and employment generating potential should this project proceed.

The project is justified on economic grounds due to two key reasons:

1. The current negative cash flow position of the site is not sustainable for its owners, and
2. There is a high opportunity cost to the Illawarra region and to NSW if the project does not proceed.

9.2 Social Justification

The site currently employs approximately 8 staff on a full-time equivalent basis. This amounts to an outlay of approximately $700 000 annually to the local Port Kembla community in wages.

Given a potential rezoning as a result of the *Three Ports* proposal, the site has the potential to support between 150 and 400 staff on a full-time equivalent basis.

Allowing the development to proceed, and therefore generating a significant employment hub in the region, would be consistent with the Illawarra Regional Strategy, which aims to generate an additional 30 000 jobs in the region between 2006 and 2031[4].

Increasing employment at the site would have flow-on job creating effects in related industries, such as transport and site services.

The project is therefore justified on social grounds due to the potential to create a local employment hub.

9.3 Environmental Justification

The project site has particular environmental requirements given its long industrial use and history of contamination. This makes it necessary to continue monitoring of key parameters to ensure that there is no risk of harm from the site to the nearby environment.

As outlined in the Economic Justification, this presents an ongoing negative cash flow. The environmental costs of compliance would therefore be more reliably met if the site was generating income.

Furthermore, the project will include measures which will provide habitat for the local endangered Green and Golden Bell Frog population.

The project is therefore justified on environmental grounds due to the cost demands of environmental management, and to protect and improve the local endangered frog population.

[3] http://www.planning.nsw.gov.au/asp/pdf/threeports_sss_proposal_may08.pdf, last accessed 21 November 2008.
[4] http://www.planning.nsw.gov.au/plansforaction/pdf/illawarra_regional_strategy.pdf, last accessed 21 November 2008.

10 References

AS/NZS 4323.3:2001: Stationary source emissions Part 3: Determination of odour concentration by dynamic olfactometry

DEC 2005: Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales

DEC 2007: Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales

NEPC: National Environment Protection (Ambient Air Quality) Measure

Department of Environment and Climate Change, 20 April 2005. Voluntary Remediation Agreement.

Department of Environment and Climate Change, 11 October 2007. Maintenance of Remediation Notice No.28033.

NSW EPA, 13 February 2004. Declaration of Remediation Site.

URS Australia Pty Ltd, 2 November 2007. Groundwater Monitoring Port Kembla Copper May 2007 Round.

Department of Environment and Climate Change, April 2008. Waste Classification Guidelines.

NSW EPA, 24 December 2007, Environmental Protection Licence no. 1753.