

09187
8 May 2009

Mr Sam Haddad
Director General
Department of Planning
23-33 Bridge Street
SYDNEY NSW 2000

Attention: Chris Wilson

Dear Mr Haddad

PART 3A REQUEST FOR MINISTER'S DECLARATION – STEEL RIVER, NEWCASTLE

We refer to the proposal for the development of a glass wool manufacturing plant at Steel River, Newcastle.

We are writing on behalf of the proponent Knauf Insulation, to seek the Minister's opinion that the manufacturing plant is a development of the kind described in Schedule 1 (Classes of development) of State Environmental Planning Policy (Major Projects) 2005 (the Major Projects SEPP) and therefore, is a 'major project' to be determined under Part 3A of the *Environmental Planning & Assessment Act, 1979* (the EP&A Act).

Should the Minister form the necessary opinion, we request that the Director General issue the requirements for the preparation of an Environmental Assessment to accompany a Project Application for the proposed development.

To support the request for the Director General's requirements relating to the environmental assessment, a Preliminary Assessment relating to the project follows. The Preliminary Assessment provides detail on the site location and an outline of the project, and identifies the key likely environmental and planning issues associated with the proposal.

1.0 KNAUF INSULATION OVERVIEW

Knauf Insulation is the second largest and fastest growing insulation manufacturer in the world. Founded in 1932 as a producer of gypsum based in Germany, Knauf has evolved into a multi-national manufacturer of building products including thermal and acoustical fiberglass insulations for residential, commercial, industrial, marine original equipment manufacturer and metal building applications.

Knauf Insulation has around 5000 employees in more than 50 countries around the world with 30 manufacturing sites for the production of glass wool, stone wool, wood wool, extruded polystyrene (XPS) and expanded polystyrene (EPS).

2.0 THE PROJECT

Knauf Insulation is looking to establish a glass wool manufacturing plant in Australia. The proposal involves the design and construction of a 24 hour operational facility approximately 30,000 square metres in area (see **Attachment A**). Roads, infrastructure, landscaping and utilities provision are also proposed.

The plant will produce a variety of insulation products including glass wool (roof insulation), white wool (blowing wool where accessibility into roofs and walls is restricted) and recycling lines (ie; yellow wool used to insulate walls).

Specifically, the project will consist of:

- Construction of a oxy-gas fired furnace capable of producing 200 tonnes of molton glass a day with a production line capacity of between 60,000 and 80,000 tonnes /year;
- Construction of four emission stacks, the highest being approximately 70 metres high;
- Storage of 70 + tonnes of raw materials including sand, soda ash, borax, limestone, nepheline and the like;
- 20,000m² of outdoor (uncovered) storage accommodate finished product;
- Potable water consumption in the order of 486m³/day (average);
- Gas and electrical supply to service the plant; and
- Constructing an internal road system to create a circular truck access route.

Construction is expected to commence in late 2009 with completion and commissioning by late 2010.

The capital investment value of the project is \$200M.

Further information on the plant is provided at **Attachment B**.

3.0 SITE DESCRIPTION

Site Location and Context

The 23 ha site is located on the Pacific Highway, Mayfield West within the Steel River Estate (Newcastle LGA) and is approximately 9 km north west of Newcastle CBD. The site comprises the following 7 lots:

- Lot 79 DP 270249;
- Lot 80 DP 270249;
- Lot 81 DP 270249;
- Lot 82 DP 270249;
- Lot 89 DP 270249;
- Lot 90 DP 270249;
- Lot 91 DP 270249.

The site is bounded by Pacific Highway (south), Pambalong Drive (east), Hunter River (north) and the Kooragang Goods Rail Line (West). Access to the site is via Steel River Boulevard and Channel Road which are accessed from Industrial Drive.

The site is strategically located within the Steel River Industrial Estate comprising Intec Metal Refinery, Horan Steel, Ulrich Aluminium, CSIRO's Energy Research Division, Hunter Water Corporation facilities, and smaller strata titled industrial lots. Detached residential dwellings are situated south of the Pacific Highway.

The contextual location of the site is included in the attached drawings at **Attachment C**.

Site History

Up to the late 1950's the site consisted of a small channel, river bank and mud flats until BHP was granted ownership of the site and commenced filling the channel with steel making by-products, such as slags and coal washery rejects.

The 1999 closure announcement of BHP's Newcastle steel making operations confirmed the site was surplus to BHP's needs and earmarked for new industrial land release. The site is currently vacant, however it has been the subject of comprehensive environmental studies including an Environmental Impact Statement (EIS), Remedial Action Plan (RAP) and associated Remediation Validation to confirm the site's suitability for industrial development.

The EIS process established the "*Strategic Impact Assessment Study*" (SIAS) which defines qualitative and quantitative standards and objectives to guide development on the site. The SIAS has subsequently been incorporated into the Newcastle LEP as a matter for consideration and is required to be considered during the formulation and assessment of development proposals within the Steel River Estate.

3.1 Transportation of goods

It is intended that shipment of raw materials to the site and distribution of finished products will be by road. Proposed truck movements will average 124 per day.

There may be potential in the longer term for goods to be transported by rail. However, this is subject to detailed negotiation with, and planning by, Australian Rail Track Corporation Ltd (ARTC) and RailCorp. This is not contemplated at present and is not part of this proposal.

3.2 Employment and hours of operation

The site will operate on a 24 hour 7 days per week basis and will employ approximately 130-140 full time equivalent staff over three shifts. Of these, approximately 55 + people will be on site at any one time.

4.0 PLANNING CONTROLS

The site is zoned 4(c) Steel River zone under Newcastle Local Environmental Plan (LEP) 2003. Industries, warehousing and distribution are all permissible with consent in the zone and accordingly the proposed development is permissible.

The following environmental planning instruments apply to the site and the proposed development:

- State Environmental Planning Policy – Major Projects 2005;
- State Environmental Planning Policy (Infrastructure) 2007;

- State Environmental Planning Policy No. 55 - Remediation of Land;
- State Environmental Planning Policy No. 33 – Hazardous and offensive Development;
- Hunter Regional Environmental Plan 1989;
- Newcastle Local Environmental Plan 2003; and
- Newcastle Development Control Plan 2005.

At this stage of project development the proposal will generally comply with all relevant statutory provisions.

5.0 MAJOR PROJECTS SEPP 2005

Clause 6 of the Major Projects SEPP provides that development that, in the opinion of the Minister, is development of a kind referred to in Schedule 1 (Classes of Development) is declared to be a project to which Part 3A of the EP&A Act applies.

Clause 9 of Schedule 1, “Metal, mineral or extractive material processing” states:

Development that has a capital investment value of more than \$30 million or employs 100 or more people for any of the following purposes:

- (a) metal or mineral refining or smelting; metal founding, rolling, drawing, extruding, coating, fabricating or manufacturing works; metal or mineral recycling or recovery,*
- (b) brickworks, ceramic works, silicon or glassworks or tile manufacture,*
- (c) cement works, concrete or bitumen pre-mix industries or related products,*
- (d) building or construction materials recycling or recovery*

The proposed development is a development of a kind referred to in the Schedule 1 and, it is therefore requested that the Minister form the opinion that the proposed development is of a type listed in Schedule 1 of the Major Projects SEPP and therefore declared to be a project to which Part 3A of the EP&A Act applies.

6.0 KEY ISSUES AND ENVIRONMENTAL RISK ANALYSIS

The following section outlines the key issues and impacts potentially arising from the proposed development. Each of these matters is discussed below and will be addressed in detail in the Environmental Assessment Report (EAR) that will accompany the Project Application.

Contamination

The site has been filled over the last 30 years with waste products from the steel making process and has consequently been declared a contaminated site. The EIS and RAP processes undertaken to date have created a containment cell and an impervious cap separating the contaminants from the surface has been placed on the site.

Construction Guidelines have been prepared for the site which must be considered and complied with when developing the site (**Attachment D**) in order to maintain the integrity of the containment cell.

Contamination will be addressed in the EAR, with particular focus on the remediated surfaces and subsurface conditions, consideration of the development’s potential to encounter contaminants, and any management measures and additional remedial measures required to mitigate the impacts of the development. The EAR will also benchmark the proposal against the adopted Construction Guidelines.

Noise

The residential properties south of the Pacific Highway are likely to be the only potential noise sensitive receivers. The following acoustic issues pertaining to the construction and operation of the proposed development will be identified in the EAR:

- industrial noise from production/manufacturing processes and other machinery;
- mechanical plant noise from building services such as air-conditioning plant and ventilation fans;
- truck movements and road traffic generated by the operation of the premises;
- loading activities;
- truck and forklift movements such as reverse beeping, engine braking etc; and
- construction of the new buildings.

To assess and address the potential acoustic issues, the location of nearby noise sensitive receivers will be identified and confirmed; noise logging will be conducted at the site and the noise sensitive receivers; spectrum noise measurements will be conducted; appropriate noise goals for the development will be established; and all noise sources will be analysed in relation to the receivers as well as the noise criteria established in the SIAS.

If controls are required to achieve noise goals at the corresponding receivers, they may include boundary noise barriers, enclosures for mechanical plant, architectural design of loading areas, building fabric insulation and a noise control management plan. The noise impacts can be controlled and managed and are considered to be of moderate significance.

Hazards, air quality, emissions and odour

The EAR will address air quality and the potential hazards associated with the chemicals and processes used in the proposed production processes. The question as to whether the production/manufacturing process and the chemicals used and stored on site trigger SEPP 33 will also be addressed.

The production/manufacturing process will release emissions of waste gases, ammoniacs and dust into the atmosphere. However, the plant will be designed to include appropriate safeguards to enable compliance with the relevant *Protection of the Environment Operations Act 1997* (POEO Act) *Clean Air Regulation* limits.

The SIAS requires development within the Steel River Estate to incorporate the latest environmental emission control technologies adopted by the DECC (EPA) and the Air National Environment Protection Measure. The proposed development will demonstrate compliance with these controls and will also demonstrate the plant's emissions are able to be managed through design and the application of appropriate technology.

Visual Impacts

The EAR will address the proposal's visual impact with particular focus on the site's current industrial zoning, contextual and surrounding uses/activities, landscaping, design (including the four proposed stacks), setbacks, potential night lighting impacts and the proposal's compliance with the SIAS.

Traffic and access

As described above the proposed development will generate truck and general traffic movements. As such, there are likely to be impacts on road and intersection capacity as a result of the proposal.

The transport/traffic and parking issues that will be addressed as part of the EAR will include:

- Details of the anticipated daily and peak traffic movements to be generated by the development including the impact on nearby intersections and the access intersection connecting with the arterial road network;
- Identification of any upgrading work to the road network associated with the development and the source of funding for such works;
- Assessment of the proposed car/truck parking and loading provisions in terms of the adequacy to accommodate demand as well as an assessment of car parking provision to accommodate demand at change of shifts;
- Assessment of the layout of the internal circulation roads and car parking areas in terms of compliance with relevant standards and suitability to accommodate circulation by B-double size vehicles.

Sustainability Performance

The EAR will include a sustainability assessment and commitments to the overall management of the development and its ongoing operations, including environmental quality, energy, transport, water, materials, ecology and emissions.

Other matters

Other matters for consideration that will be addressed in the Environmental Assessment and may assist the Director General in identifying the general requirements and key project specific issues to be addressed are as follows:

- Compliance with relevant planning controls
 - Consideration of the relevant planning controls affecting the site and justification for any departures
- Planning agreements/developer contributions
 - Review of the proposal against the requirements in the Newcastle Section 94 Contributions Plan
- Soil and water
 - Stormwater management, including on site detention and relationship to the overland flow path that traverses the site
 - Flooding
 - Water quality management
 - Water supply including the potential for rain water harvesting
 - Wastewater disposal
 - Proposed erosion and sediment control measures
- Light Spill
 - Confirmation that sensitive users are unlikely to be affected due to topography, distance and site design
 - Compliance with relevant Australian Standards

- Infrastructure and Servicing
 - Capacity of surrounding infrastructure
 - Provision of services and easements for services.

7.0 CONSULTATION

Public authorities

The proponent has commenced preliminary consultation with a number of relevant public authorities as described below.

- Newcastle City Council: Discussions were held regarding development control matters and to ascertain any issues regarding the proposed use of the site. We understand that Mirvac Domaine (as the existing owner) has also approached Council regarding the project.
- Department of Environment and Climate Change (DECC): DECC was consulted in relation to the proposed development needing to be licensed under the POEO Act.
- Department of Planning: Meetings held in April and early May to discuss the proposed development.
- Department of State and Regional Development: Meetings held in March, April and May to determine suitable site locations.

Community

The proposed development may cause some disturbance to the surrounding community. Community concerns will be confirmed through the consultation process and could potentially include concerns about:

- perceived additional truck movements and continuity of noise levels associated with truck and vehicle movements to and from the site;
- noise associated with the operation of machinery and other equipment;
- odour and air quality emissions;
- temporary impacts during construction such as dust, noise, traffic and parking;
- night-time noise associated with 24-hour operations; and
- light spill effects.

A community consultation process with the local community will assist in identifying any potential concerns at the environmental assessment stage and provide the proponent with the opportunity to manage the concerns raised. Potential strategies to minimise, manage or mitigate these impacts will be identified and documented in the EAR.

8.0 CONCLUSION

We trust that the above and enclosed Preliminary Assessment is sufficient to enable the Minister to form an opinion that the proposed development is a Major Project to be dealt with under Part 3A and to allow the Director General to issue requirements for the preparation of the necessary Environmental Assessment.

Should you have any queries about this matter, please do not hesitate to contact me on 9409 4912 or gkirkby@jbaplanning.com.au.

Yours faithfully

A handwritten signature in blue ink, reading "Gordon Kirkby", is displayed on a light blue rectangular background.

Gordon Kirkby
Principal Planner

Enclosed:

- Attachment A – Indicative Development Plan
- Attachment B – Knauf Insulation Process Description
- Attachment C – Context Site Plan
- Attachment D – Construction Guidelines (Contamination)



LEGEND

- SITE
- EASEMENT LINE
- MINIMUM LANDSCAPING TO SETBACK
- 300 M BUFFER TO ADJACENT RESIDENTIAL
- FIRE TRACK (LARGE ISOLATED BUILDING)
- INSULATION PLANT ACCESS ROUTE
- EXPANSION ACCESS ROUTE
- SIGNALIZED INTERSECTION



New Glass wool plant in Australia

Process Description

KNAUF INSULATION, part of Knauf group, which produce insulation materials in different plant all around the world.

In a way of business development, Knauf wants to install a new plant in the East part of Australia.

The purpose of this letter is to explain the how Knauf Insulation proceed to produce glass wool as an insulation material.

Presentation of all activities in the plant.

⇒ General information on KNAUF INSULATION

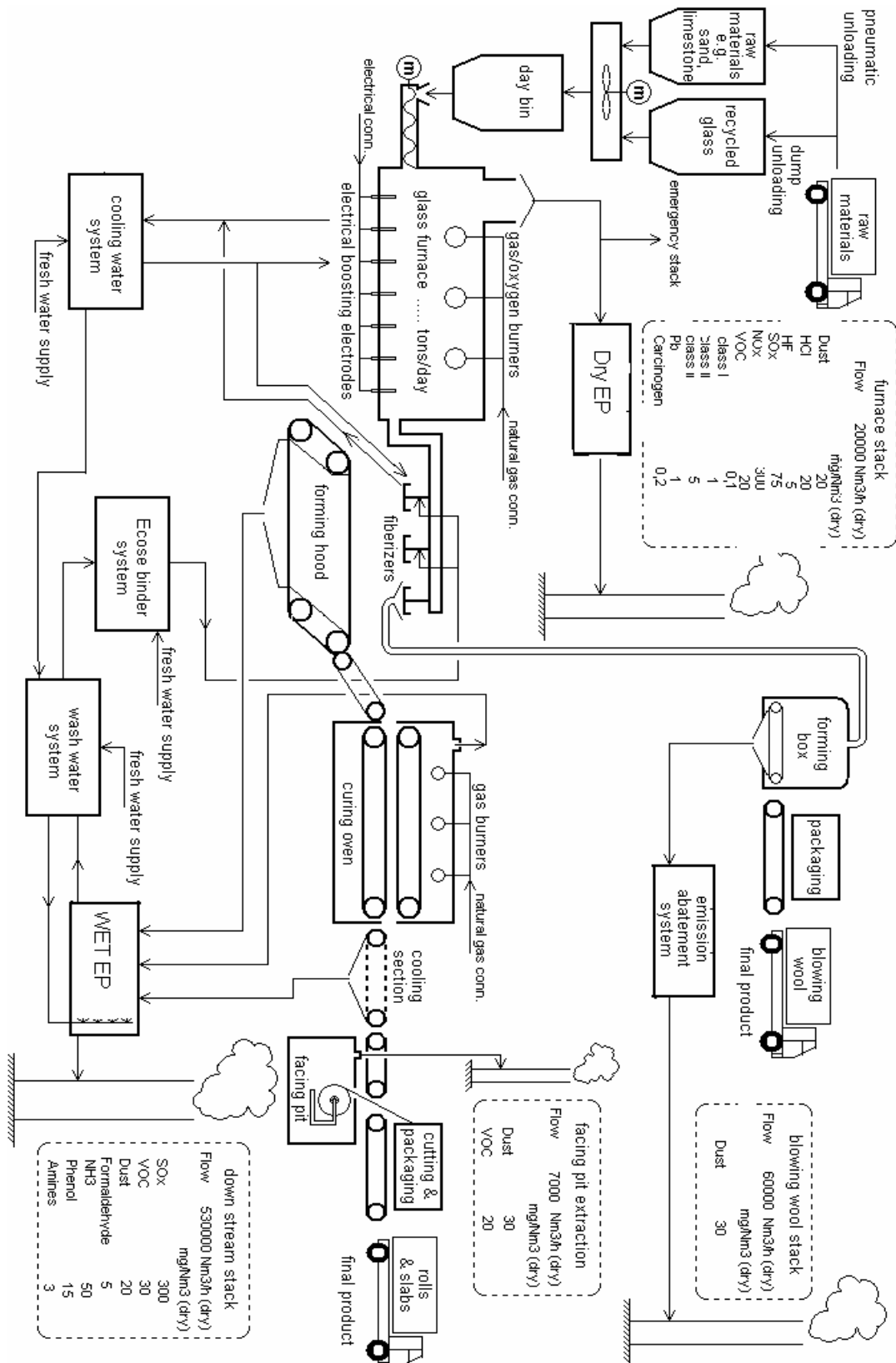
The company KNAUF INSULATION is specialized in Insulation materials

1. **Glass wool :**
 - o Rolls of glass wool (insulation of the roof),
 - o White wool (this is a blowing wool without binder and we use when there is no accessibility in the roof or in the wall),
 - o Panel (to insulate the walls).
2. **XPS and EPS** (polystyren,...),
3. **Stone wool** (roof insulation and special application).
4. **Wood wool**

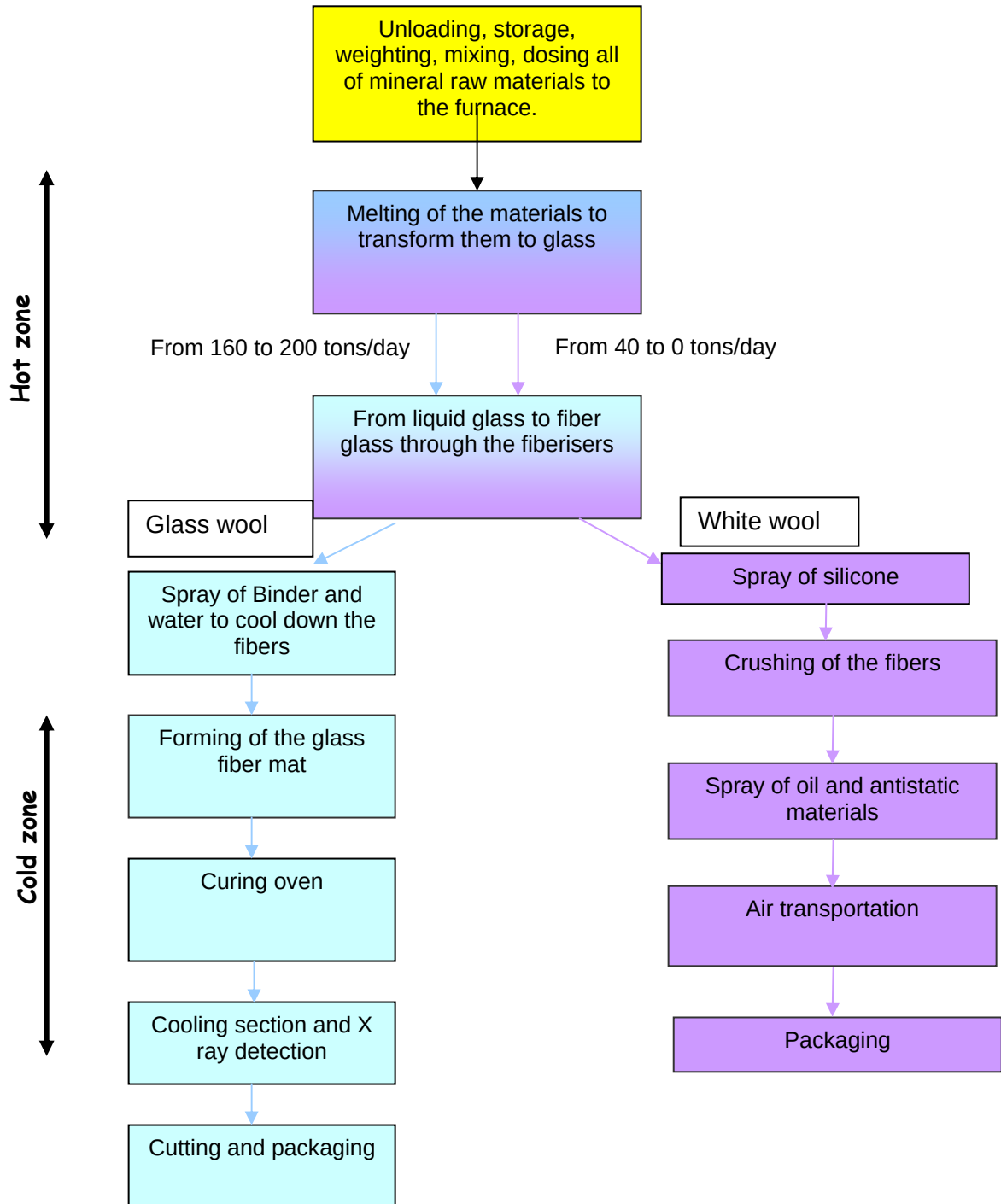
The future plant in Australia will produce only **Glass wool**.

⇒ Activities in the plant :

1. One line of glass wool (from 160 to 200 tons/day),
2. One line of white wool (from 40 to 0 tons/day),
3. One recycling line.(Crush the normal glass wool which is rejected to transform it into blowing wool : Named Yellow wool)



Overview:



General description of the glass wool manufacturing :

The raw materials for glasswool, mainly sand and recycled glass bottles, will be mixed and conveyed into a gas fired furnace at 1200°C and transformed into molten glass. This molten glass is then directed downwards through spinning fiberisers which convert the glass into 'wool fibers' through centrifugal force. A solution of organic Ecosse binder is sprayed on the fibers which are then distributed on a moving production line to form a 'blanket' of glasswool. This 'blanket' proceeds through a curing oven and is 'cut to size' and compression packed as roll or in batt.

General description of the White wool manufacturing :

The melted glass from the same furnace is fiberized but not sprayed with any binder. Fibers are crushed, sprayed by silicone, oil and antistatic material and packaged in bags. Final application of the product is done through a blower machine.

General description of the Yellow wool manufacturing :

'Blankets' of glass wool which don't meet quality requirements, or are offcuts from the production line, are crushed and recycled. The wool is packaged in bags. Final application of the product is done through a blower machine.

Furnace

The furnace is made by refractory bricks with a steel structure frame. Some Oxy gas burners and electrodes are installed to give enough the energy to be able to melt the raw materials to glass.

The exhaust is cooled by outside air, pass through a Dry EP and goes to the stack.

There is an emergency stack which is used in case of Dry EP maintenance (few hours a year).

Air environmental impact

There are 4 mains discharge points in our typical plants:

1. Furnace : melting activities

- Combustion waste gas (CO₂, NO_x, SO_x, VOC,...) due to the combustion of natural gas and melting in carbonates materials
- Heavy metals (cadmium, mercury,) come from the cullet (recycled glass),
- HF and HCl from impurities of some raw materials

2. Downstream emission (Forming area, curing oven, cooling section) :

- Combustion waste gas (CO₂, NO_x, SO_x, VOC,...) due to the combustion of natural gas and melting in carbonates materials
- Emission of, ammoniac, dust, VOC come from organic binder.

3. Emission of VOC due to the polyethylene glue for eventual facing on the mat of glass wool.

4. Emission of dust due to the crush of fiber in the white wool line.

On the drawing here inserted you can see typical emission value for our glass wool plants. This is the worst case and should be better with Ecosse binder and new design technology.

Energy management

The glass manufacturing is a high energy-consuming. Due to that, Knauf Insulation has implemented new techniques to decrease this energy consumption. As 75 to 80% of the total amount of energy consumes is to melt the glass, here under these techniques

- Use of Natural gas in place of oil.
- Furnace use oxy/gas burner with electrodes boosting
- Low NO_x burner for all of burners on site.
- The use of cullet can decrease the melting temperature from 1500°C to 1200°C

Ecosse binder: What is ECOSE™ Technology?
--

ECOSE™ Technology is a revolutionary, new, natural, formaldehyde-free binder technology, based on rapidly renewable organic materials instead of oil based chemicals. It reduces embodied energy and delivers superior environmental sustainability. ECOSE™ Technology was developed for glass and rock mineral wool insulation, but offers the same potential benefits to other products where resin-substitution would be an advantage.

Cooling system

- Some of the parts in the process need to be cooled down with water. To do so, we use cooling system with open cooling tower. The typical cooling power is 6000kw. With our typical open cooling tower we evaporate 8m³/h and we purge 4m³/h which is recycled in the wash water.
- There is also an independent cooling water system which cools down the molten glass when the fibers production is stopped. The glass is transformed in cullet and re-used afterwards in the furnace as raw materials.

Wash water system

This system can recycle all of process water we need in the plant. This water is used to clean the air stream in all of our abatement system. We collect it and use it to dilute the binder for application on the fibers. There are equipments to clean that water to be able to re-use it.

Oxygen plant

To feed the oxy-gas burners of the furnace, we need to produce the oxygen on site. We are using mainly adsorption system. As a back up, two tanks of liquid oxygen can be added on site.



 The Site



Pointer -32°52'39.71" S 151°43'11.02" E elev 9 m

Streaming ||||| 100%

Image © 2009 Sinclair Knight Merz
© 2009 MapData Sciences Pty Ltd, PSMA

© 2007
Google™
Eye alt 1.06 km





Dames & Moore
Woodward Clyde

REPORT

STEEL RIVER PROJECT - CONSTRUCTION GUIDELINES

Prepared for

Steel River Pty Ltd

Att: Alan Norton
PO Box 1195
NEWCASTLE NSW 2300

5 March 2002

45973-002



Report

**STEEL RIVER PROJECT -
CONSTRUCTION GUIDELINES**

Prepared for
Steel River Pty Ltd
PO Box 1195
NEWCASTLE NSW 2300

5th March 2002



URS Australia Pty Ltd
ACN 000-691-690
Unit 4, 56 Industrial Drive
Mayfield NSW 2304 Australia
Tel: +61 (2) 4960 3311 • Fax: +61 (2) 4960 3322

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1.1 Introduction

These Construction Guidelines set out the protocols:

- which must be followed when carrying out works which require the excavation of, or intrusion into, the capping layer; and
- which must be complied with to preserve the integrity of the approved remediation strategy for the site.

The Construction Guidelines need to be taken into account when preparing a Site Management Plan for a specific development within the Steel River Project site.

2.1 Site History

The Steel River Site has been used by BHP over a period of 80 years as an area for disposal of slag produced as part of the steel making process. The Steel River Site is essentially an area of reclaimed land where slag has been used for reclamation purposes. Slag is essentially an inert waste material, however, small quantities of other wastes were co-disposed with the slag resulting in some materials being contaminated with polycyclic aromatic hydrocarbons (PAHs) and tar.

2.2 Site Capping

In accordance with the EIS, areas suspected or known to be contaminated above the site criteria¹ within the top 2 m of the original site surface, have been capped with a minimum of two metres of coal washery reject (CWR) or similar material. This material was imported to the site to supplement existing material to achieve the site "capping layer".

In other areas of the Steel River Site, where previous investigations have indicated a lower potential for contamination to be present within the top 2 m of the original surface a capping layer of less than 2 m may be present.

The objectives of the capping layer are:

- to provide a physical barrier between the underlying potentially contaminated materials, thereby minimising the potential for human contact with the contaminants; and
- to minimise the infiltration of rain water to the underlying groundwater, thereby reducing the volume of groundwater discharging from the Steel River Site to the adjoining South Arm of the Hunter River.

Any development works undertaken on the Steel River site must not compromise these two objectives.

¹ As defined in the EIS the site remediation criteria applicable to the top 2 m are:

- the presence of free tar;
- total PAH concentrations exceeding 400 mg/kg; and
- benzo(a)pyrene (an individual PAH) concentrations exceeding 15 mg/kg.

3.1 General

There are generally three different situations where consideration of the function and integrity of the capping layer is required, namely:

- Earthworks required for buildings, roads or car parks;
- Earthworks required for general re-grading; and
- Landscaping.

In the event that the site development requires intrusion or penetration into the capping layer, then the site requirements described in the following sections will need to be considered.

3.2 Guidelines for Preserving the Integrity of the Capping Layer

The main point of issue for the Steel River site is the depth to which construction will take place. The overall requirements of a development involving penetration or intrusion into the capping layer are two fold, namely;

- that the developer is able to demonstrate that the development will not compromise the integrity of the capping layer with respect to the objectives described in the Remediation EIS and summarised in Section 2.2; and
- that excavated materials are handled and, if required, disposed of in accordance with the requirements of the Remediation EIS.

It should be noted that following the completion of a site development, provided that the integrity of the capping layer has not been compromised, it may not be necessary to maintain the capping layer at the thickness present prior to development taking place. The integrity of the capping layer relies on:

- the ability to maintain a physical barrier between potentially contaminated materials and occupiers of the site following development; and
- the maintenance of a low permeability free draining surface.

The replacement of the capping layer with other materials of low permeability (ie. bitumen or concrete paving) or buildings could achieve the same or better result as the presence of the compacted CWR. Such materials and structures would also provide an effective barriers to potential human contact with underlying potentially contaminated materials.

Such developments will, however, require approval subject to the provisions of SEPP 55.

It should also be noted, that there exists potential for contaminated materials to be intersected during excavation works undertaken beneath the capping layer outside of the areas identified in the EIS as having a high potential of containing contaminated materials above the site criteria. These materials will need to be handled and disposed in accordance with the requirements of the EIS.

3.3 Buildings Roads and Carparks

The construction of buildings on site is likely to involve concrete slabs constructed on regraded (either filled or cut) surfaces. Car parks and roads may also be constructed on either filled or cut surfaces although it is expected that for much of the Steel River site, the roads and car parks will involve boxing out such that the finished surface levels will approximately match the design earthwork levels.

Care should be taken by responsible parties where excavations are to be undertaken at any location within the Steel River site. The methods and techniques involved in the construction of buildings are many and varied. If the proposed development includes intrusion into or penetration of the capping layer, then BHP Billiton must be informed and the following steps may be required;

- develop a project specific health and safety plan and environmental control plan;
- place excavated CWR material in a separate stockpile to underlying material;
- ensure material excavated from beneath the capping layer is stockpiled appropriately with all necessary bunding in place in accordance with the environmental management plan;
- employ appropriately qualified consultants to characterise the stockpiled material according to the site specific remediation criteria;
- materials exceeding the site specific remediation criteria must be disposed of at the Steel River containment area;
- materials meeting site specific remediation criteria must be re used on site; and
- excavations should be backfilled with CWR or equivalent material only or waste materials meeting the site specific remediation criteria.

3.4 General Regrading

It is likely that developments will require some regrading of the lot in order to achieve desired levels associated with the specific development.

General regrading may result in either the reduction or increase in the thickness of the capping layer. Not withstanding the comments made in Section 3.2, it is preferable that the total thickness of the capping

layer should not, in the relevant areas identified in the EIS, be allowed to fall below 2 m where these sections of the site are not to be covered by semi-permeable or impermeable paving/structures. This would be in accordance with the requirements of the EIS. If it is necessary to reduce the thickness of the cap in these locations, then it will be necessary to demonstrate that the integrity of the cap has not been compromised. Alternatively it may be necessary to excavate materials contaminated above the site criteria following similar steps outlined in Section 3.4 to restore the 2 m cap.

3.5 Landscaping

Some landscaping may be required in open areas of a site development. Where this is undertaken, it will be necessary to consider the requirements for site excavations and regrading as detailed in Sections 3.3 and 3.4. The overriding requirement for landscaped areas is that they cannot be used for drainage purposes. Where landscaping is installed, it must be designed so as to promote lateral and not vertical drainage. This will require maintenance of the low permeability compacted CWR layer (or equivalent) and also maintenance of lateral drainage across the top of the low permeability layer. In order to maintain the drainage characteristics of the landscaped profile, it may be necessary to include a subsurface drainage system feeding into the stormwater system to minimise the potential for perching of water above the low permeability layer.