

Environmental Assessment

**For the Relocation and Expansion
of Cookson Plibrico Refractory Operations**

Lots 1 & 2 DP 1064872

10-12 Sylvester Avenue, Unanderra

**Prepared for Cookson Plibrico Pty Ltd
by TCG Planning
Commissioned by Prince Property Consulting**

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We certify that the information contained in this Environmental Assessment is neither false nor misleading and based on information we take to be truthful and correct at the time of printing.

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1 Executive Summary

This Environmental Assessment has been prepared for Cookson Plibrico regarding the relocation of an existing refractory to a new site at Sylvester Avenue, Unanderra. Cookson Plibrico currently operates from premises at Bulli, approximately 18 kilometres to the north of the subject site. Cookson Plibrico have operated from the Bulli site since the 1960s, however, due to encroaching residential development, in particular the development of the Sandon Point area, the operation is significantly impacted and needs to relocate. After an extensive search Cookson Plibrico have found a suitable site in Unanderra that, if approved, will allow it to continue operating in the Illawarra, and retain much needed local jobs.

The proposal has been identified as a development that is captured under clauses 9 (b) and 9(c) of State Environment Planning Projects 2005 (Major Projects), which includes *“development for the purpose of ceramic and cement works, and related products that employs 100 people or more”*. Therefore the proposed development is a project to which Part 3A of the Environmental Planning and Assessment Act 1979 applies. In this regard, the Director-General of the Department of Planning, as a delegate for the Minister for Planning, provided advice dated 25 September 2008 confirming that the development is a project to which Part 3A of the Environmental Planning and Assessment Act 1979 applies (see Appendix 2). A Preliminary Environmental Assessment of the site was prepared and submitted to the Department of Planning on 6 February 2009. The Director-General issued the requirements for the Environmental Assessment on 9 March 2009.

The subject site (figure 1) is identified as Lots 1 and 2 DP 1064872, and is located on the south-western side of Sylvester Avenue, Unanderra. The site has an area of 2.697 hectares and is zoned 4(a) Light Industrial. There is no existing development on the site, which has frontage to Sylvester Avenue and an access handle to the Princes Highway. The site drains to the Princes Highway. The subject site and surrounding context are described in detail in Section 2 of this Environmental Assessment.

The proposal will employ approximately 110 people, of which 70 will be on site the majority of the time. Cookson Plibrico produce castable products used in high-heat industry applications through seven (7) processes, which are outlined in detail in Section 3 of this report, and include the Crushing and Screening Process, Ball Mill Operation, the TEKA Batching System (dry powder blending), RAM Operation (plastics refractory), COMCAST Slab Production, PRECAST Slab Production and Taphole Clay Production. The existing Cookson Plibrico operations at Bulli also incorporate mortar production, which is used in refractory brick laying projects. It is noted that this area of machinery will not be transferred to the new facility.

The current plant at Bulli also includes the operations of Cookson Plibrico subsidiary, Andreco-Hurll Refractory Services Pty Ltd, which install products manufactured by Cookson Plibrico. Andreco Hurll are intended to also relocate to the Unanderra plant and will occupy a designated area within the proposed building. Cookson-Plibrico and Andreco Hurll share some services, including accounts and contract staff. The Andreco Hurll operations conducted at Bulli and within the current proposal predominantly relate to administration and contracts.

Section 4 of this report details the statutory framework that relates to the proposal. Section 4 outlines the manner in which the proposal meets the requirements of State Environmental Planning Policy (Major Projects) 2005; State Environmental Planning Policy No. 33; State Environmental Planning Policy No. 55;

State Environmental Planning Policy (Infrastructure) 2007; Illawarra Regional Environmental Plan No. 1; Wollongong Local Environmental Plan 1990; Draft Environmental Planning Instruments and Wollongong Development Control Plan No. 6. Section 5 details other legislation which will apply to the project including legislation relating to environmental performance, traffic requirements and flora/fauna. A discussion of the licensing requirements of the development is also contained within this section.

The land lies within the 4(a) Light Industrial zone of Wollongong Local Environmental Plan 1990. The proposal will satisfy the objectives of the 4(a) Light Industrial zone given that the proposal is a manufacturing activity in an existing industrial estate.

The proposal is considered to fall within the definition of '*Light Industry*' under Wollongong Local Environmental Plan 1990 because the processes will not interfere with the amenity of the neighbourhood as demonstrated in the range of consultants' reports that have been prepared, in accordance with the Director-General's requirements. The consideration of the proposal as a light industry is further supported by the history of the operations at the Bulli site. The site has operated on a light industry site for many years, with the only identifiable concern for residents being noise. Noise issues have been mitigated in the proposal by internalising the operations, replacing noisier machinery and limiting the hours of operation for the Com Cast Vibro Table. The topography and proximity to residents also alleviates noise concerns. The consultant reports have considered any changes that would be required to ensure minimal amenity and environmental impact from the proposed operations at Unanderra. Many of the consultant reports contain minimal recommendations, and hence the proposal in its current form is considered to be of minor impact, thereby complying with the Light Industry definition.

The impact on the amenity of the surrounding neighbourhoods is an issue that has been considered extensively in the preparation of the supporting documentation for this proposal, which have been summarised below. Sections 6, 7 and 8 of this report outline the key issues and environmental considerations that relate to the proposal.

▪ **Acoustic Report**

An Acoustic report prepared by Acoustic Studio in May 2009 and supplementary correspondence dated 16 October 2009 came to the conclusion that *no additional noise controls are required to control operational noise levels during the typical operating scenario for the facility*. The report also recommended that the Comcast vibration table not be used between the hours of 6pm to 7 am to avoid adverse effects.

▪ **Traffic Impact Assessment**

The Traffic Impact Statement prepared by KFW considers the existing and proposed traffic and parking conditions and the impact the proposed development is likely to have on the existing conditions in the surrounding road network. The findings of the report are summarised below:

- KFW conclude that the streets within the area have ample capacity to cater for the predicted increased traffic generation.
- KFW recommends truck access to the site be from Sylvester Avenue via Orangegrove Avenue, and egress from the site be via left turn onto the Princes Highway.
- All other vehicles (visitor and employee) accessing the site will be via Sylvester Avenue only.
- The largest vehicle accessing the site will be a 12.5 metre long heavy rigid vehicle (HRV) which can egress the site in accordance with AS 2890.2.

- With respect to parking, KFW conclude that the number of parking spaces required by DCP 6 is unnecessary in this case, based on the existing operations at Bulli, and that sufficient parking has been provided on site to allow for the actual usage requirements.

▪ **Air Quality Assessment**

Envirodyne Group performed an air quality assessment on the proposal and concluded that the proposal using worse case modelling does comply with the Clean Air Regulations of the NSW Protection of the Environment Operations Act 1997 and its associated Regulations. The current plant in Bulli has no history of odour complaints based on the lack of odour complaints. The report concludes that impact levels beyond the plant boundaries are well within statutory guidelines. Further, the relocated plant will not increase the level of pollutants as tabled in the DECC Air Emissions Inventories for the NWS Greater Metropolitan region. The assessment of emissions from the plant show a miniscule contribution to overall pollution levels. The assessment does not indicate any reason why the proposal should not proceed.

▪ **Waste and Soil and Water Management**

BECA carried out a waste study to determine the waste impact of the proposal, with respect to the *Waste Classification Guidelines* from DECC. BECA conclude that *"based on the current design information, Cookson Plibrico's equipment can be transferred to its new location without significant adverse impacts form generation of production waste"* although council approval will be needed for the planned wastewater treatment plan. BECA also conducted a review of the water management for the proposed relocation of the Cookson Plibrico plant. BECA conclude that the *"water management systems by Cookson Plibrico for their new Unanderra plant represent good environmentally sensitive design practice which should not result in any significant adverse impacts."*

▪ **Visual Impact**

The visual impact of the proposed building has been considered by Design Workshop Australia, who ascertain that there will be no visual impact created from the proposed development and that the topography of the site and surrounds assist to encompass the building, in effect reducing the buildings prominence. The building has been designed to merge into the existing surrounding industrial fabric and the proposed colour scheme is consistent with the existing industrial character of the surrounding estate.

▪ **Greenhouse Gas and Energy Efficiency Assessment**

Envirodyne Group conducted a Greenhouse Gas (GHG) Assessment of the proposed development. Envirodyne ascertain that under the reporting requirements of the National Greenhouse and Emissions Reporting Act ('NGER Act'), the new plant at Unanderra will be well within the reporting threshold and hence is not required to submit annual reporting on GHG emissions. The assessment does not indicate any reason why the proposal should not proceed.

▪ **Hazards and Risks**

Whamcorp Pty Ltd considered the proposal from a Hazards and Risks perspective. They conclude that the new Cookson Plibrico facility and associated operations present no significant risk and in general the risks are controlled by the relevant Australian Standard.

▪ **Stormwater Runoff**

Stormwater runoff issues were considered by KFW, who have implemented open channels that will accommodate both excess stormwater runoff from the proposed building, and also from properties up stream to reduce the impact and runoff onto the down slope properties. Any stormwater that leaves the site will be treated prior to release into the proposed drainage system. Stormwater impacts on the surrounding properties will be minimal from the proposal.

Section 9 of this report contains an outline of the proposed environmental management and monitoring measures that are recommended for Cookson Plibrico's Unanderra plant. Specifically, this section contains a description of the measures that should be considered for implementation to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project. These measures include the implementation of safeguards in relation to hazard risk control, monitoring of exhaust airstreams and ventilation rates, the limitation of the hours of operation of the Com Cast Vibro table to between 7am and 6pm only and the implementation of a waste management hierarchy that aims to minimise and where possible re-use waste. These measures can be implemented in the construction and operation phases of the proposal and there were no issues raised that should prevent the operation from proceeding.

Section 10 of this report outlines the consultation that occurred with the relevant local, state or commonwealth government authorities. In particular, consultation was carried out with the Department of Energy and Climate Change, the Roads and Traffic Authority and Wollongong City Council. Section 10 describes the consultation process, the issues raised and the manner in which any concerns have been addressed in the proposal.

The proposed relocation of the Cookson Plibrico operations meets the statutory requirements that apply to the subject site and the proposed use. The proposal is consistent with surrounding development and will have limited impacts on residential developments. A number of environmental consultant reports accompany this Environmental Assessment that make recommendations to mitigate any potential amenity or environmental issues. It is considered that the proposed use is an appropriate use on the subject site and will not pose unreasonable impacts on existing or future developments in the locality. Furthermore, the project holds great local importance as it will allow for the retention of local jobs that are otherwise likely to be relocated off shore.

2 Site Context

Section 2 contains an outline of the subject site, its character and other land uses within the locality. Specifically, this section contains a description of the physical characteristics of the subject site and any land constraints that apply to the site, and a description of the existing development immediately surrounding the subject site and within the locality.

2.1 Subject Site

The proposed Cookson Plibrico refractory is to be located at Unanderra on the property identified as Lots 1 and 2 DP 1064872, and known as No's 10-12 Sylvester Avenue, Unanderra. The property is owned by V & M Davidovic Pty Ltd. The subject site is located within an existing industrial estate approximately 8 kilometres south west from the Wollongong CBD.



Figure 1: Plan showing location of Subject Site at 10-12 Sylvester Avenue, Unanderra

The subject site contains two points of access, one from Sylvester Avenue and also via a 20m wide access handle from the Princes Highway (see figures 1, 2 and 3). The land is irregular in shape and has a total approximate area of 2.7 Ha, including the access handle. The site is over 200 metres in length, has an average width of approximately 110 metres and falls approximately 18 metres to the north (thereby containing a general slope of approximately 10°). The subject site is zoned 4(a) Light Industrial under Wollongong Local Environmental Plan 1990 (LEP 1990). Council has not identified any significant constraints applying to the property.

The site is presently vacant (figure 2) but the battleaxe access driveway from the Princes Highway is formed. The land contains a small rise on its south-western boundary, which effectively screens it from that direction. The site slopes down from south to north, and has an average gradient across the site of approximately 11 percent. The site slopes up from the Princes Highway.



Fig 2: Access to the subject site from Sylvester Ave



Fig 3: The access handle showing the ROW from the Princes Highway (looking south)

2.2 Surrounding Development

The subject site is located in an existing industrial estate in the suburb of Unanderra, approximately 8 kilometres south-west of the Wollongong CBD. The site is surrounded by industrial development in all directions. The adjoining allotments to the south-west of the site have frontage to Canterbury Road and contain industrial development, as well as a site approved for a waste recycling facility (although this consent has now lapsed). The adjoining lots to the south-east contain a storage depot for Grace Removals and Joy Mining Machinery (figures 5 and 6), which manufactures and services machinery for the mining industry. Across Sylvester Avenue to the north-east is a small warehouse containing a sex services premises (figure 7). Adjacent to No. 13 Sylvester Ave is SITA Environmental Solutions, where large site bins are stored (figure 8).

Adjoining the site to the north-west is the Fielders Bakeries complex (figure 8), which contains a building of a similar size to that proposed on the subject site (see the buildings adjacent to the Princes Highway access handle in figure 3). Immediately to the west of the battleaxe driveway is a development containing glass and window salesrooms (Sassall Glass) and a Coates equipment hire depot.

In the wider context, the site is located in an industrial estate of approximately 190 hectares in area. The site is nestled between the Princes Highway and south coast railway line to the north, which separates the subject site from the residential development in Orana Parade. The F6 Freeway to the south-east, which separates the industrial estate from the suburb of Berkeley. Further to the north, and directly across the Princes Highway, is the south coast railway line. The Orana Parade residential subdivision is approximately 300 metres to the north of the site and contains approximately 100 dwellings. Approximately 300 metres to the south-west of the site are dwellings associated with the Kembla Grange racecourse and equestrian centre. Closer to the site, 145 metres to the south-west, is the Illawarra German Association and two dwellings fronting Canterbury Road. Approximately 240 metres to the south/south-west is the Hansen and Cole Funeral Parlour.

Approximately 300 metres to the south-east of the site, on the opposite side of the F6 freeway, is low-density residential development in the suburb of Berkeley. There is also low-density residential development approximately 600 metres to the east of the site. The topography of the area screens the proposal from non-industrial development to the south and east, as well as from much of the development to the north.



Fig 4: Grace Removals (storage depot) to south east of subject site.



Fig 5: Joy Mining Machinery to the south east of the subject site



Fig 6: 13 Sylvester Ave – warehouse containing sex premises



Fig 7: SITA Environmental Solutions

3 Project Description

Section 3 describes the development proposal in detail. Specifically, this section describes why the relocation of the plant from Bulli to Unanderra is necessary; provides a detailed description of the proposed operations; and provides an outline of the exact processes that will be undertaken at the plant, including amounts and uses for the end products.

3.1 Current Operations

Cookson Plibrico currently operates from premises at Sandon Point at Bulli. Cookson Plibrico is a large local employer, and the Company's activities have been ongoing at the Bulli site since 1968. The business operations primarily include the production of refractory products used in high-heat industry applications. In this regard, Cookson Plibrico produce castable products of high purity concrete which can be exposed to high temperatures. The operation currently produces approximately 400 tonnes of finished product per week, which equates to approximately 21,000 tonnes per annum.

The business operation is now being significantly impacted by encroaching and proposed residential development, which necessitates the relocation of the operation from its current site. Historically, the primary concern of residents surrounding the Bulli site has been noise impacts. This was largely due to the use of certain machinery and because some of the current operations take place externally. Some of the machinery and equipment used in the manufacturing process has adversely impacted upon the newly constructed surrounding properties.

The current plant at Bulli also includes the operations of Cookson Plibrico subsidiary, Andreco-Hurll Refractory Services Pty Ltd. It is intended that Andreco-Hurll will also relocate to the Unanderra plant and will occupy a designated area within the proposed building, situated between the office and the Cookson Plibrico operations. Cookson-Plibrico and Andreco Hurll share some services, for example accounts and contract staff, which will continue in the Unanderra factory. Andreco-Hurll install products manufactured by Cookson Plibrico. However, the operations conducted at Bulli and within the proposal pertain to administration and contracts. Andreco Hurll have a separate workshop in Tate St, Wollongong, at which maintenance and storage uses will continue to be undertaken. It is noted that the figures contained in this Environmental Assessment, such as employee and parking numbers, pertain to the total operations on the site including both the Cookson Plibrico operations and the Andreco-Hurll operations.

3.2 Consideration of Alternate Sites

After an extensive search Cookson Plibrico and Andreco-Hurll have decided to relocate to a suitable site in the Unanderra industrial estate that, if approved, will allow them to continue operating in the Illawarra, so retaining and increasing much needed local job numbers.

3.3 Environmental Assessment Background

On 6 February 2009 a Preliminary Assessment regarding the Cookson Plilbrico project was lodged with the Department of Planning by Prince Property Consulting. This Preliminary Assessment provided an overview of the development proposal and the site context, identified the statutory framework under which the proposal would be assessed and summarised the key issues for consideration of the application. This Preliminary Assessment indicated that the development would be captured by Group 2 (Part 9) of Schedule 1 of State Environmental Planning Policy No. 55 (Major Projects). Specifically, the development would be defined as a metal, mineral or extractive processing facility, which employs more than 100 people. Further information regarding the implications of State Environmental Planning Policy No. 55 (Major Projects) are contained in Section 4.3 of this Environmental Assessment.

3.4 Project Description

The proposed site is identified as Lots 1 and 2 in DP 1064872, and is located on the south western side of Sylvester Avenue, Unanderra. The site has an area of 2.697 Ha.

The Company intends to relocate the exiting business from Bulli to Unanderra, maintaining the operational elements of the production facility although upgrading and improving the processes where possible. The operations will be housed in the proposed factory building designed by PRD Architects. The architectural plans have been included as Appendix 1 of this report and are listed as follows;

Site Plan	Ref: 08-030; Drawing DA01 Revision B dated June 09
Floor Plan	Ref: 08-030; Drawing DA02 Revision A dated May 08
East, North and west Elevations	Ref: 08-030; Drawing DA03 Revision A dated May 08
South Elevation and Section	Ref: 08-030; Drawing DA04 Revision A dated May 08

3.4.1 Employee numbers

The proposal will employ a total of 110 people, including approximately 50 office employees and 60 factory employees, working varying shifts. Please note these staff figures include the total staff for both the Cookson-Plilbrico and Andreco Hurl operations and some services are shared between both companies. It is important to note that the office is ancillary to the refractory operation. It is not feasible for the office workers to be housed in a separate location in, for example, a commercial zone, as this would result in significant production and management inefficiencies.

3.4.2 Hours of Operation

The proposed hours of operation of the development are Monday to Friday, 6.00am to 10.00pm. The operation will occur in two shifts, being 6.00am to 2.00pm and 2.00pm to 10.00pm.

3.4.3 Operational Processes

The products produced by Cookson Plibrico are refractory products used in high-heat industry applications. The end products are castable products of high purity concrete so they can be exposed to high temperatures. Andrec-Hurll work in conjunction with Cookson Plibrico to install the products for end users. Both the existing and proposed operational outputs comprise a number of particular processes, some of which are aligned while others are independent. The industrial processes in summary are as follows (*note: MT = Mega Tonne*):

1. Crushing and Screening Process: The preliminary process to be undertaken at the proposed factory involves bringing raw materials into the plant, which are then subjected to initial crushing and screening.
 - 1.1 Approximately 5500MT of aggregate Raw materials are brought into the plant per year.
 - 1.2 Material is elevated to a rotating crusher where it is smashed and/or sieved into different size fractions.
 - 1.3 Crushed and sized materials will then be conveyed to hoppers sitting on top of the TEKA batching system, or into bags/bins for further processing through the Ball Mill.
2. Ball Mill Operation: Product from the crushing and screening process is then further processed in the Ball Mill plant (refer figure 9) which delivers a size reduction in, and homogenisation of, the raw materials in preparation for later applications.
 - 2.1 1300 MT/year of the screened product is processed in the Ball Mill plant.
 - 2.2 The Ball Mill is a rotating conical mill containing steel balls designed to further reduce the size of the aggregate into a fine powder in preparation for later application through the TEKA batching machine (refer figure 10).
3. Dry Powder Blending (TEKA Batching System): The TEKA product line utilises the refined material produced by the Ball Mill operation to make a dry powder which is either stored for later onsite use (for example in the Plastic/RAM operation) or bagged ready for market (off site) sale (approximately 6350 MT/year).
 - 3.1 In order to produce the dry TEKA materials, the TEKA batching line (figure 10) uses the refined material (5500 MT/year of screened product and 1300 MT/year of milled product) plus 7500 MT/year of purchased raw materials (cements, silica fume, clays etc).
 - 3.2 The TEKA machine will consist of 16 x 30 Tonne hoppers where product is batched onto a weigh scale conveyor. Material is then conveyed into a skip/hopper.
 - 3.3 A bag opener will be used to add the purchased raw materials to the same belt to also be conveyed into the skip.
 - 3.4 The skip is then raised to a 1.5 MT mixer where the product is mixed for an average of 5 minutes.
 - 3.5 The mixed material is then expelled into a bagging unit and is bagged off. There is a range of packaging types and sizes. Some material is sold externally and some is used internally for the processes described below.

4. Plastic/RAM Operation: The RAM line operations (plastic refractory) take the TEKA product (dry powder) and blends it with other elements, such as Phosphoric acid, Phenolic resin or Aluminium Orthophosphate, according to client requirements. The material is mixed and then discharged onto an incline conveyor to be extruded through a hydraulic ram (refer figure 11). The extruded blocks are boxed or bucketed (900MT/year) for later use (off site) in the repair of furnace linings or containers that hold liquid metals.

5. COMCAST Slab Production: The COMCAST plant makes use of the pre-blended product from the TEKA to fashion precast slabs and other moulds (3000 tonnes of precast shape/year), according to client requirements, which are subjected to oven curing.
 - 5.1 Material manufactured on the initial (TEKA) batching plant is raised to a 1.5 tonne mixer (figure 12) where water is added to create a wet cement mix, which is mixed for 5 minutes.
 - 5.2 The cement is then emptied into a 2m x 2m mould which is vibrated for 8 minutes to de-air and level the cement.
 - 5.3 The moulds are then left overnight to cure.
 - 5.4 Once cured, the moulds are stripped and the slab is taken to an oven for the drying process. The maximum temperature of the oven is 250 degrees Celsius with a four to five day cycle. Material in the oven cures with a 50% reduction in moisture content from approximately 3.2% to 1.6% moisture.
 - 5.5 The final precast slabs are utilised to provide a lining for the electrolytic cells employed in the Aluminium smelting process.

6. PRECAST Shape Production: The PRECAST area consists a 500kg mixer (refer figure 13) whereby material from the TEKA batching machine is emptied into the mixer and water is added to create a wet cement mix. This is then emptied into a small mould (i.e., 5kg to 300kg) where material is then vibrated for 8 minutes before being levelled off and left to cure for 18 hours. Once the mould is stripped the shape is then dried in an oven with a similar drying cycle to the Comcast slabs.

7. Taphole Clay Production: The TAPHOLE product line utilises Resins and Hexamine to create a malleable clay type product for specialised use in the control of high temperature liquidised metals, such as those found at the base of blast furnaces or may used to open and close the “taphole” in furnaces while iron is being produced. The premix for this machine will again be manufactured on the TEKA batching plant.
 - 7.1 The premix is vibrated into the mixer (figure 14) and mixed with Resin and Hexamine to the right consistency before it is dropped onto an incline conveyor to then be extruded through a hydraulic ram (figure 15).
 - 7.2 Small 4kg squares are extruded onto a belt where they are then hand stacked into 1.4 tonne boxes ready for shipment (2500 MT produced per year).

The existing Cookson Plibrico operations at Bulli also incorporate mortar production. Mortar material is produced, to client requirements, using the bagged TEKA powder, water and Sodium Silicate, which is mixed before being packaged for use (off site), for example, in refractory brick laying projects. It is noted that this area of machinery will not be transferred to the new facility.



Fig 8: Ball Mill Crusher



Fig 9: TEKA Mixer



Fig 10: Plastic RAM Machine



Fig 11: COMCAST Mixer and Vibrating table



Fig 12: PRECAST Shape Mixer



Fig 13: Taphole Clay Mixer



Fig 14: Taphole Clay Mixer

The proposed operational processes are summarised in the following flow diagrams included as figures 16 to 22. Figure 16 is a general summary of the whole refractory processes undertaken at Cookson Plibrico, and Figures 17 to 22 detail each of the separate processes described in 1-7 above.

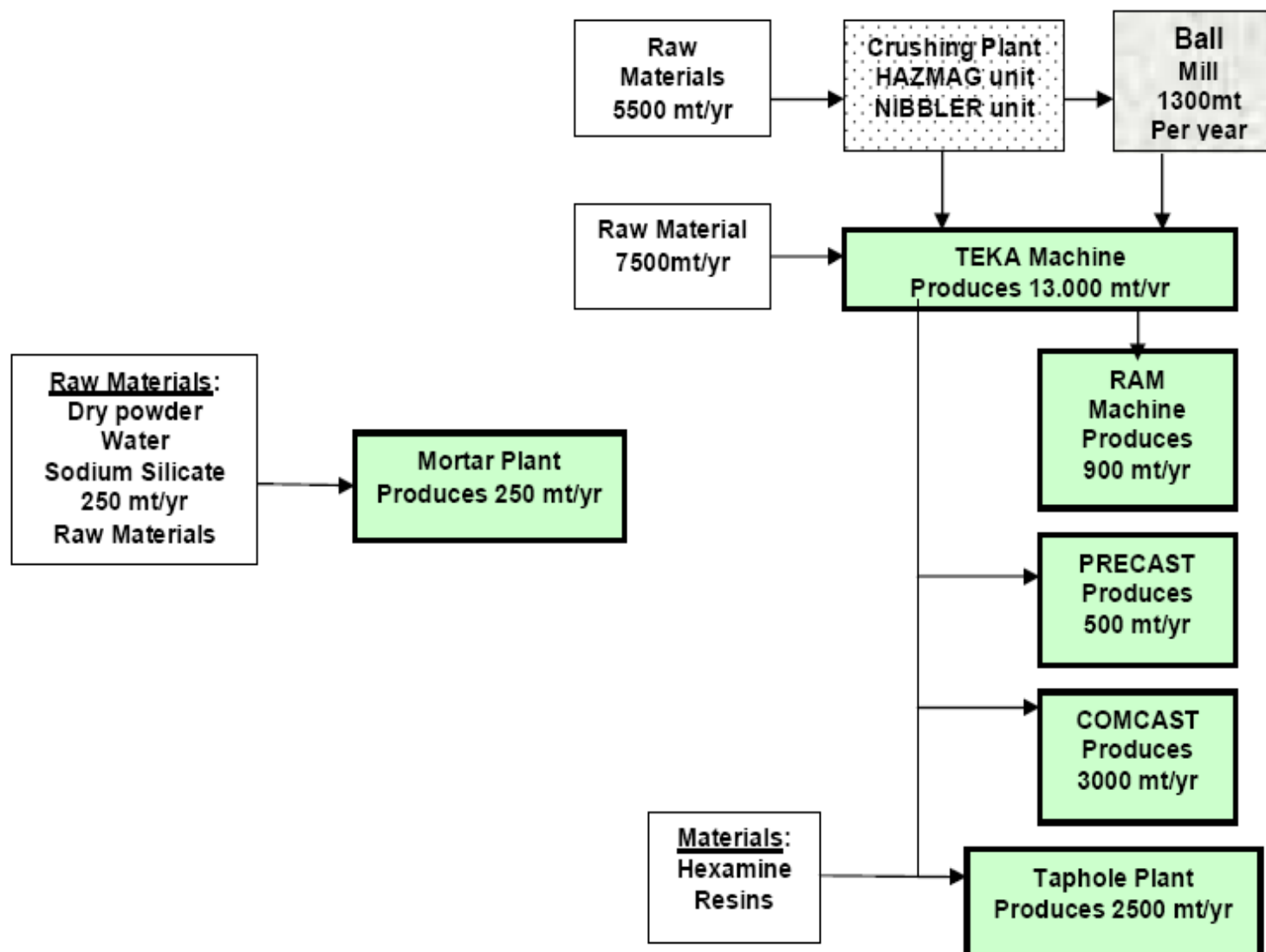


Fig 15: Cookson Plibrico Processes Flow Diagram

3.4.4 Mitigation Measures

Cookson Plibrico will employ a number of measures within the proposed refractory operation, designed to minimise adverse impacts. The following provides a summary of such measures, with further detail regarding the listed measures contained in the later sections of this report.

Dust Collection: Each production unit is fitted with a dust collection system that captures the emissions from each process in bags, before returning them to the process.

Wastewater: The plant and equipment is cleaned and maintained using air and water pressure devices with the wastewater treated onsite before being recycled in the production process.

Heating Processes: The Cookson Plibrico plant utilises natural gas in its heating process. A small boiler is used to provide hot water to a heating jacket on storage tanks in order to maintain viscosity conditions for stored resins and for the heating of ovens for curing of cast products.

Amenity Issues: Amenity issues have been properly addressed in preparation for the proposed relocation. Firstly, the new site will internalise the entire operation to abate the potential impacts, particularly of noise or particulate emissions. The style of construction will also aid in the containment of undesirable emissions.

Furthermore, some of the louder machinery will not be used in the new factory as material movements will be managed via other more modern systems as opposed to the Bulli plants use of loud front end loaders. The topography and distance to residents will also help mitigate any emission concerns, given that the closest residents are well separated from the plant at a minimum distance of approximately 300m.

Emissions: The exhaust flues servicing the ovens will be fitted with filters and or scrubbers as required to manage any potential emissions.

3.4.5 Vehicle Movements

The proposed operation will see an average of 400 tonnes of raw materials and product transported by road vehicles per week, with the largest vehicles entering the site being a 12.5 metre long HRV (in accordance with AS 2890.2). It is estimated that truck movements will be relatively regular, with approximately four truck movements into the site and four truck movements out of the site each working day (Monday to Friday only), predominantly during daylight hours. Vehicle access to the site is proposed from Sylvester Avenue with large vehicle truck exit onto the Princes Highway only. The traffic movement information is detailed in the Traffic Impact Statement prepared by KFW (2009), which is included as Appendix 11. Appendix D of the KFW Traffic Impact Statement contains details of turning path movements on the site.

As contained in the Traffic Impact Statement, KFW indicate that with respect to employee and passenger vehicles, an average of 102 cars may be parked on site during the peak period (shift changeover). Based on the existing facilities, visitors to the site will be approximately 7 passenger vehicles per day. All employee and visitor vehicles will access the site via Sylvester Avenue.

3.4.6 Loading and Unloading

Loading and unloading is currently carried out by solid-tyred fork lift vehicles. The average time to load or unload a truck is 30 minutes, and up to one hour to load a container. Special areas have been set aside for loading and unloading. These are included in and enforced by the OH&S site management plan.

3.4.7 Waste Generation

Waste from the operation is housed in separate waste containers. Advice from Cookson Plibrico confirms that the waste generation from the operation is expected to be as follows:

- 3 general waste bins/week (15m³ each) @ 5MT/bin
- 2 recycling bags/week @ 100kg
- 1 dust bin/fortnight @ 4MT
- 1 Front lift bin (Laboratory waste)/week @ 200kg

The waste is all solid, non-putrescible waste and can go to landfill. The exception is the recycling bags, which will be delivered to Flagstaff in Unanderra. In addition to this, there is a metal recycling bin that is removed periodically (approximately once per month).

Furthermore, the wastewater treatment contractor has confirmed that the plant will require one pump-out of liquid type waste (i.e. sludge) per year (approximately 3,000 – 4,000 litres). However, depending on the design and choice of vendor, the number of sludge pump-outs may be up to 6 per year (on average every two to three months). These figures have been allowed for in the traffic movements for the site. The waste must go to a registered liquid waste facility. A primary chamber/tank will be constructed for storing waste prior to pump-out as part of the development.

3.4.8 Servicing

Augmentation of existing water and electricity services will be required, subject to endorsement by relevant servicing authorities. The proposal will require a substation of approximately 1000 KVA. The substation will be located on site at Sylvester Avenue, close to the shared boundary with the property to the south.

It is intended that an on site package treatment plant will be provided to treat the domestic sewage/grey water and the process waste water to a tertiary level, suitable for reuse on the site and/or discharge to the site stormwater system. All site wastewater would be directed to the package treatment plant, where it would be treated and reused on site for irrigation or toilets or discharged to the stormwater system. Liquid waste will be stored and collected as described in section 3.4.7 above.

Figure 16

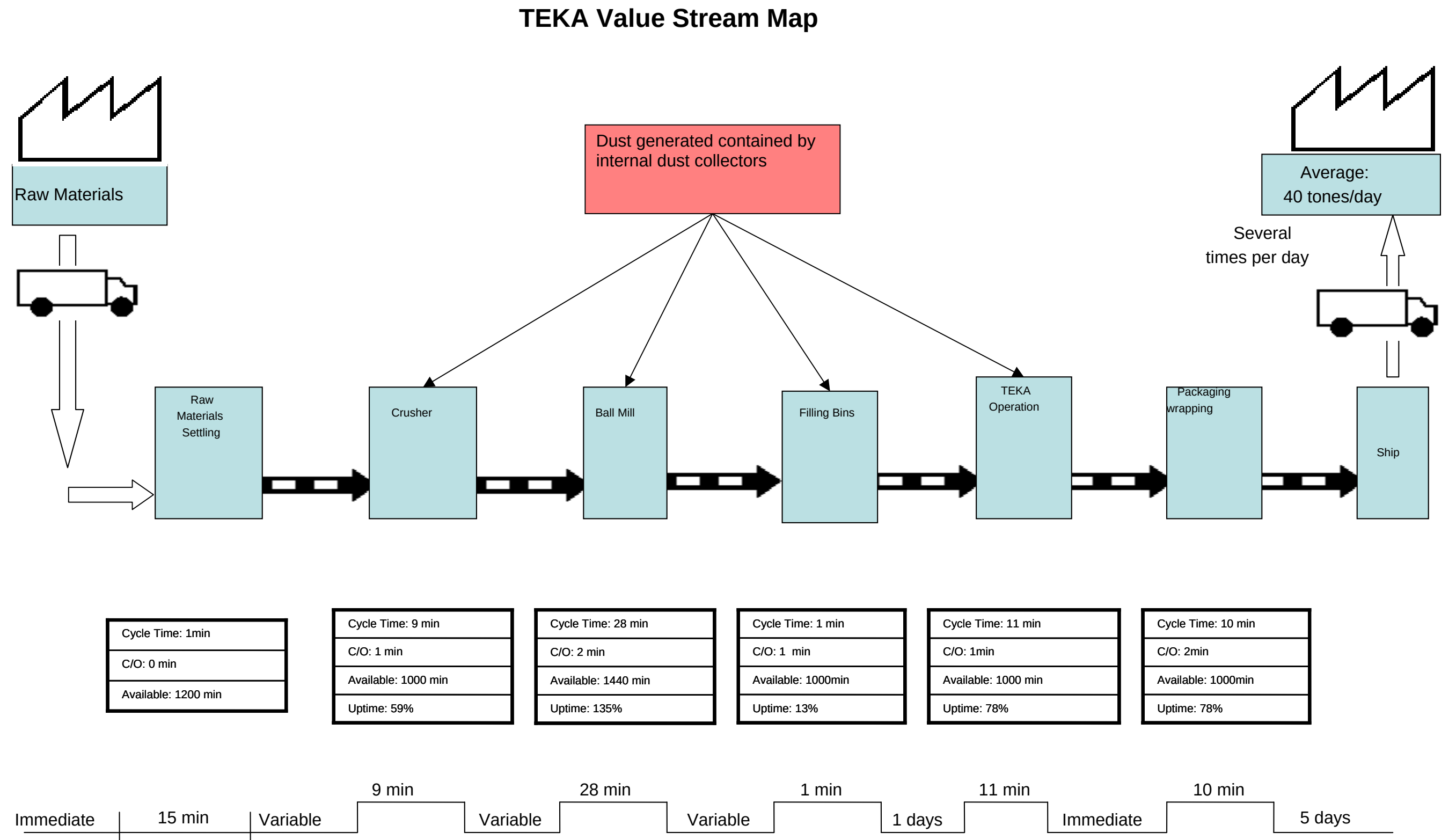


Figure 17

TAPHOLE CLAY Value Stream Map

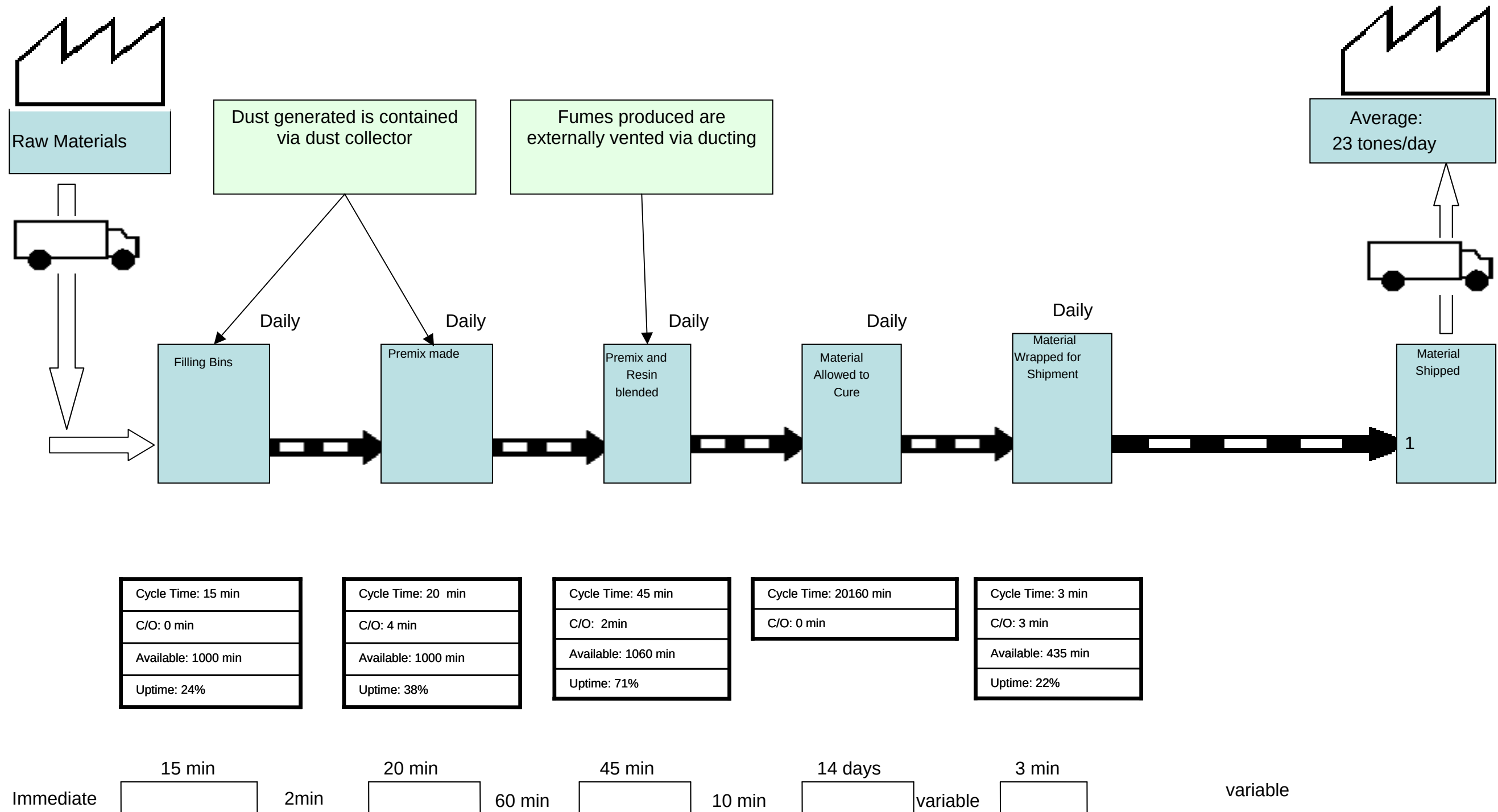


Figure 18

COMCAST Value Stream Map

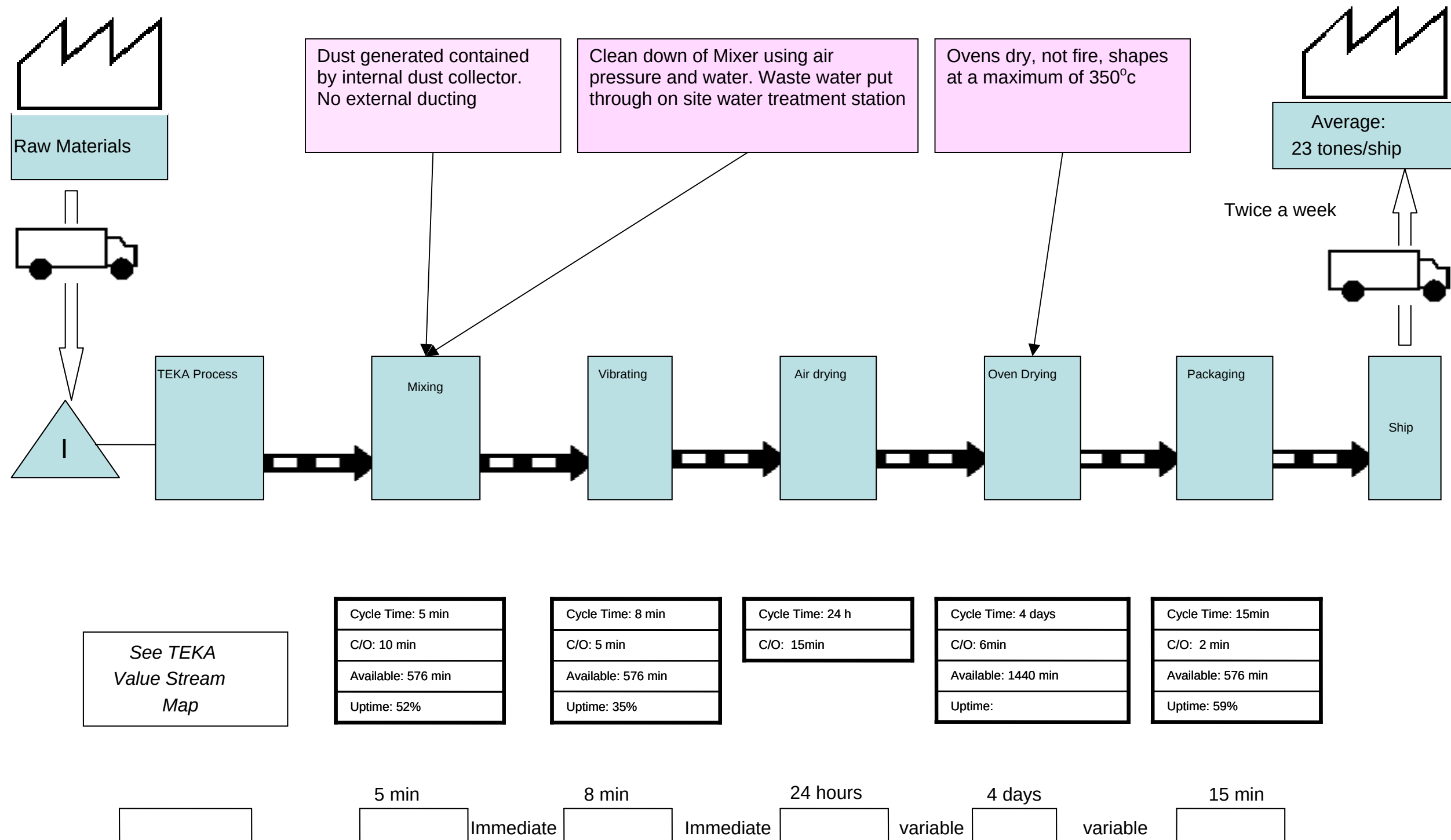


Figure 19

RAM Value Stream Map

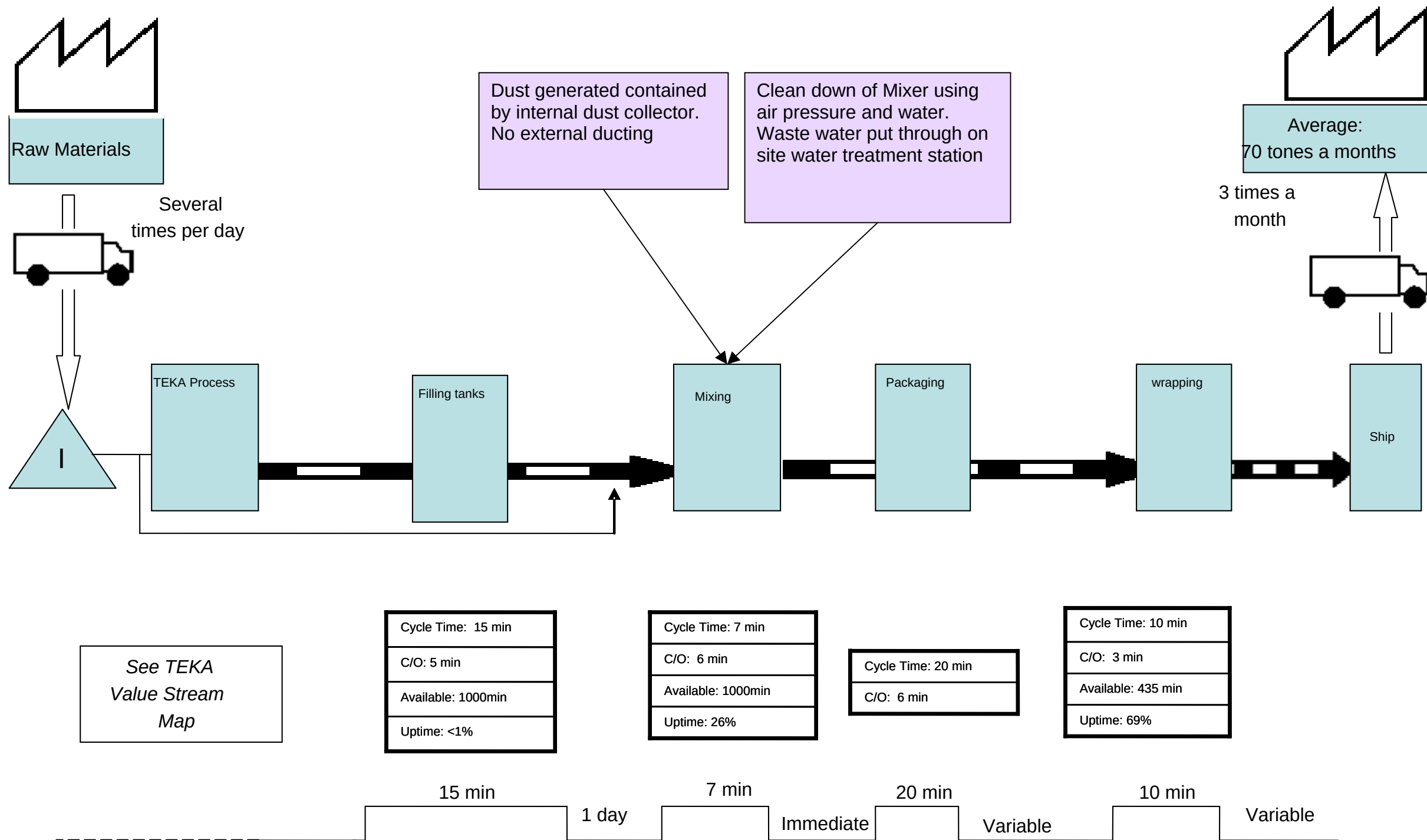


Figure 20

MORTAR Value Stream Map

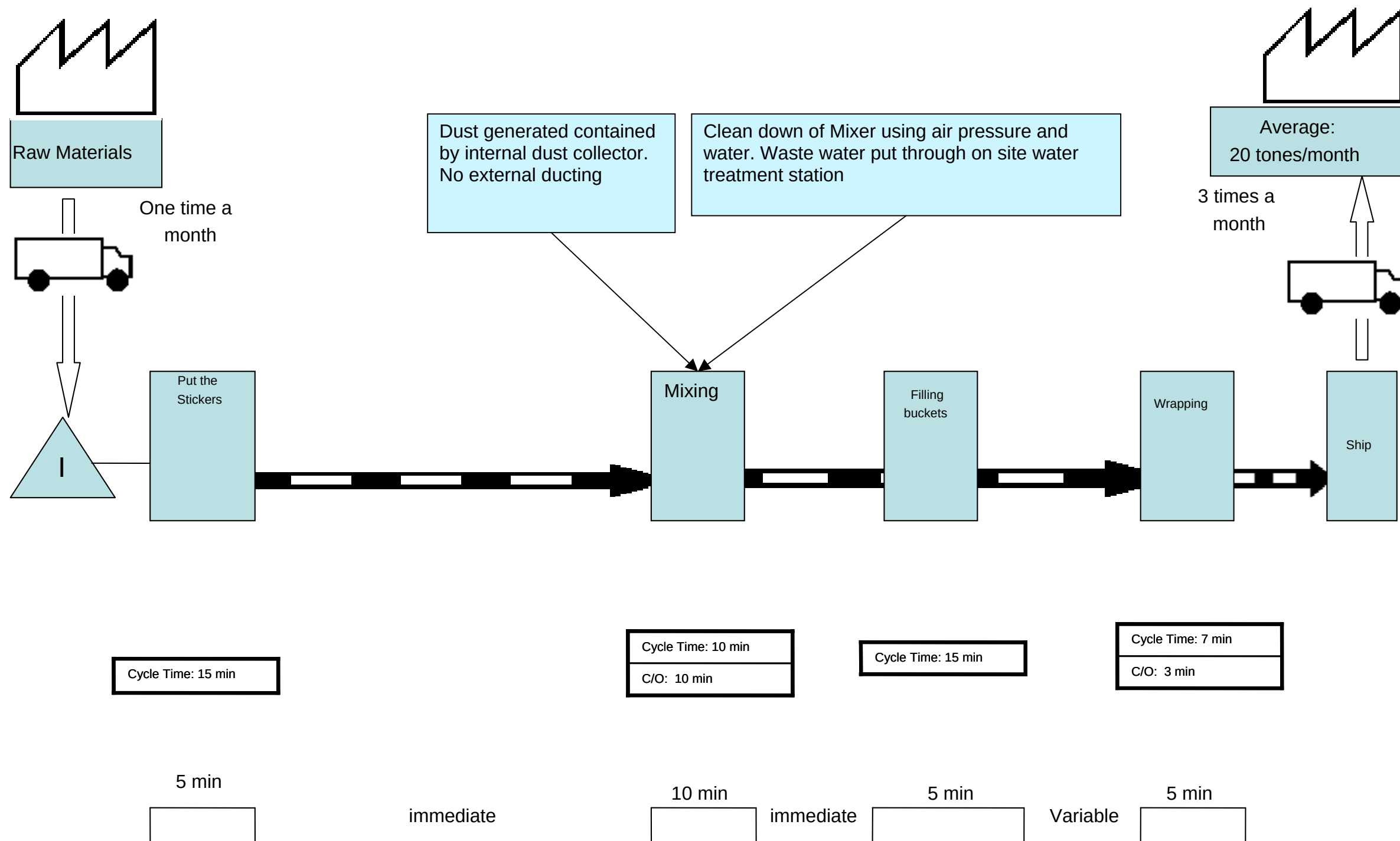
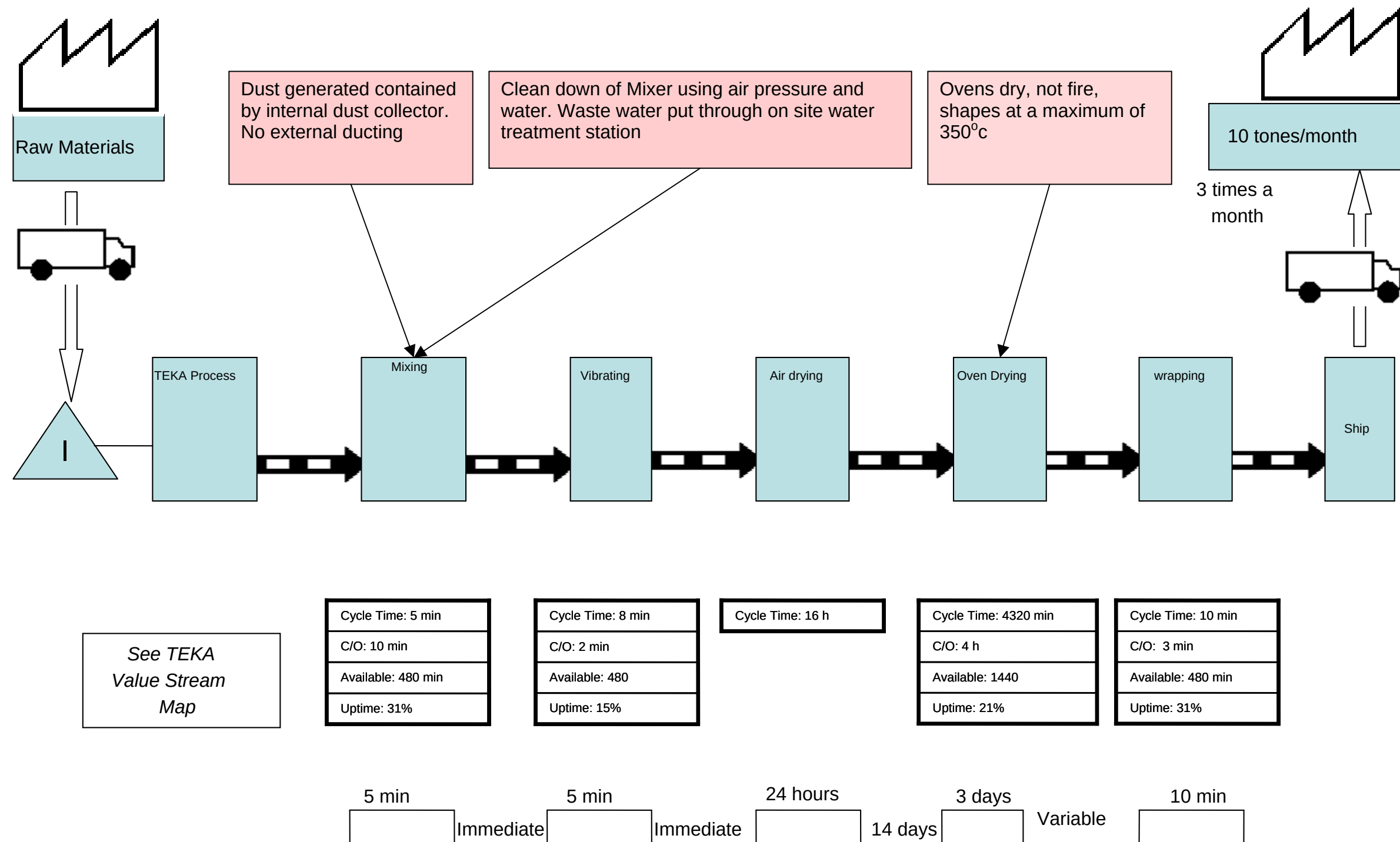


Figure 21

PRECAST Value Stream Map



4 Statutory Planning Framework

Section 4 contains information regarding the statutory planning framework which applies to the proposed development and the subject site. This includes relevant state environmental planning policies, regional plans and local environmental plans. Consideration is also given to the implications of draft environmental planning instruments, which have been publicly exhibited.

4.1 State Environmental Planning Policy (Major Projects) 2005

State Environmental Planning Policy (Major Projects) applies to certain development that is considered to be of significance to the state.

Schedule 1 of SEPP 55 lists the types of development that are regarded as major projects. The proposed development is captured by Group 2 (Part 9) of Schedule 1, lists the following development as being subject to Part 3A:

“9 Metal, mineral or extractive material processing

*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 will employ 110 people for the purpose of a combination of ceramic works, cement works and related products.

The Director General, in advice dated 25 September 2009, confirmed that he had formed the opinion that the Cookson Plibrico Refractory Project “*is development of a kind that is described in Schedule 1 of the State Environmental Planning Policy (major Projects) 2005 – namely clauses 9(b) and (c) ‘development for the purpose of ceramic and cement works, and related products that employs 100 or more people’ and is thus declared to be a project to which Part 3A of the Environmental Planning and Assessment Act, 1979 applies for the purpose of section 75B of that Act*”. A copy of the Record of the Minister’s Opinion is included as Appendix 2.

The Director General’s requirements for the proposal (ref: MP 09-0045) were provided on 9 March 2009. A copy of the requirements are attached as Appendix 3.

4.2 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) was gazetted on 13 March 1992. Through SEPP 33 the permissibility of an industrial proposal is linked to its safety and pollution control performance. SEPP 33 provides for a merit-based assessment and aims to ensure that the merits of proposals in relation to off-site risk and offence are properly assessed before being determined. SEPP 33 applies to any proposals that fall under the policy's definition of '*potentially hazardous industry*' or '*potentially offensive industry*'.

Specifically, SEPP 33 – Hazardous and Offensive Development aims to "*ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact*". The guidelines "*Applying SEPP 33*" have been prepared by the Department of Planning (draft, July 2008) to provide advice on interpreting and implementing the state policy and to assist in determining which development should be considered under SEPP 33. The guidelines provide a risk screening procedure, based on the quantity of dangerous goods and the distance of the materials from the site boundary, to assist in determining whether a development proposal falls within the definition of potentially hazardous industry.

The proposed operation uses or stores several components which are defined as dangerous goods. One of those goods, a resin called Hexion Durite AB 403, will be stored in a 50 000 litre tank. Testing the volume of dangerous goods against the threshold levels in the SEPP 33 Guideline is normally a complex task. However in this case the resin alone, which has a Dangerous Goods Classification of 6.1 Packing Group 3, is stored in a volume that crosses the threshold. Therefore a "*Preliminary Hazard Analysis*" has been conducted as a component of the Environmental Assessment. A summary of the outcomes of this "*Preliminary Hazard Analysis*" (Whamcorp, 2009) is contained in section 7.1 of this Environmental Assessment.

4.3 State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55)

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) provides a statewide planning approach to the remediation of contaminated land. SEPP 55 aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment by specifying when consent is or is not required for a remediation work, by specifying certain considerations that are relevant in rezoning land and by requiring that remediation work meets certain standards and notification requirements.

Clause 7 of SEPP 55 requires a consent authority to consider whether land is contaminated before consenting to development of that land. If so, the consent authority must be satisfied that the land is suitable in its contaminated state for the proposed development, or that it will be remediated so that it becomes suitable for the proposed development.

An initial search of Council records has not revealed any development approvals that have proceeded to construction on this part of the site. Furthermore, contamination has not been identified as an issue by the

Department of Planning in the Director-General's requirements. It is understood that the site was formerly on the same land as the bakery that is now on the adjoining site to the west.

4.4 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) commenced on 1 January 2008 and contains specific planning provisions and development controls for 25 types of infrastructure works or facilities. The Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the state. The Infrastructure SEPP replaces 20 State Environmental Planning Policies, including SEPP 11 – Traffic Generating Developments.

The planning provisions previously in SEPP 11 have been updated and carried over into the Infrastructure SEPP. Clause 104 of the Infrastructure SEPP outlines the planning requirements for traffic generating development listed in Schedule 3 of the SEPP. As previously with SEPP 11, if development is proposed that meets the traffic generating criteria in Schedule 3, the Roads and Traffic Authority (RTA) must be consulted. In accordance with Clause 104 of the Infrastructure SEPP, the proposal falls under Schedule 3 as the gross floor area exceeds 5,000m² for an industrial building with access to a classified road. Therefore it is noted that the proposal requires referral to the RTA for their consideration. Clause 104(3) states the following:

- (3) Before determining a development application for development to which this clause applies, the consent authority must:*
- (a) give written notice of the application to the RTA within 7 days after the application is made, and*
 - (b) take into consideration:*
 - (i) any submission that the RTA provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, the RTA advises that it will not be making a submission), and*
 - (ii) the accessibility of the site concerned, including:*
 - (A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and*
 - (B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and*
 - (iii) any potential traffic safety, road congestion or parking implications of the development.*

The RTA provided comments that were included along with the Director-General's requirements prior to the preparation of this Environmental Assessment. The correspondence from the RTA was included as an attachment to the letter containing the Director-General's requirements (refer Appendix 3), and required consideration of a range of issues including:

- the preparation of a traffic impact study, which is to include a crash analysis;
- justification for any access to the Princes Highway;
- details of the relationship of the access to the highway with the carparking located along the access driveway;
- electronic copies of the swept path analysis;

- a SIDRA analysis at the junction of the Princes Highway and Orangegrove Road, considering AM and PM movements and a 10 year forecast;
- details of the environmental impacts of any roadworks within the Environmental Assessment, to negate the need for a separate “Review of Environmental Factors”.

KFW have addressed these requirements in their Traffic Impact Statement. The Traffic Impact Statement also addresses issues pertaining to the accessibility of the subject site, including transport of people and freight to and from the site and potential traffic safety, road congestion or parking implications. The traffic issues have been discussed further in section 8.3 of this report.

4.5 Illawarra Regional Environmental Plan No. 1 (IREP 1)

It is noted that Regional Environmental Plans are to be repealed as part of the 2008 NSW Planning Reforms, but at the time of writing this has not yet occurred.

Illawarra Regional Environmental Plan No. 1 (IREP 1) was made on 11 April 1986 and applies to all land within the City of Wollongong. IREP 1 aims to maximise the opportunities for the people of the region and the State to meet their individual and community economic and social needs. Part 6 of IREP 1 previously related to industry, however Part 6 has been repealed.

Clause 139 of IREP 1 relates to building height and contains a provision requiring all buildings in this location greater than 11 metres in height to obtain concurrence from the Director. The proposed overall building height is 15.7m, and therefore the application requires concurrence from the Director-General. A discussion of the need for this increased building height and the potential implications are discussed within section 4.7 of this Environmental Assessment.

4.6 Wollongong Local Environmental Plan 1990 (WLEP 1990)

4.6.1 Clause 9: Zone Objectives

The land lies within the 4(a) Light Industrial zone of Wollongong Local Environmental Plan 1990 (WLEP 1990). The zoning of the site and surrounding lands is shown in figure 22.

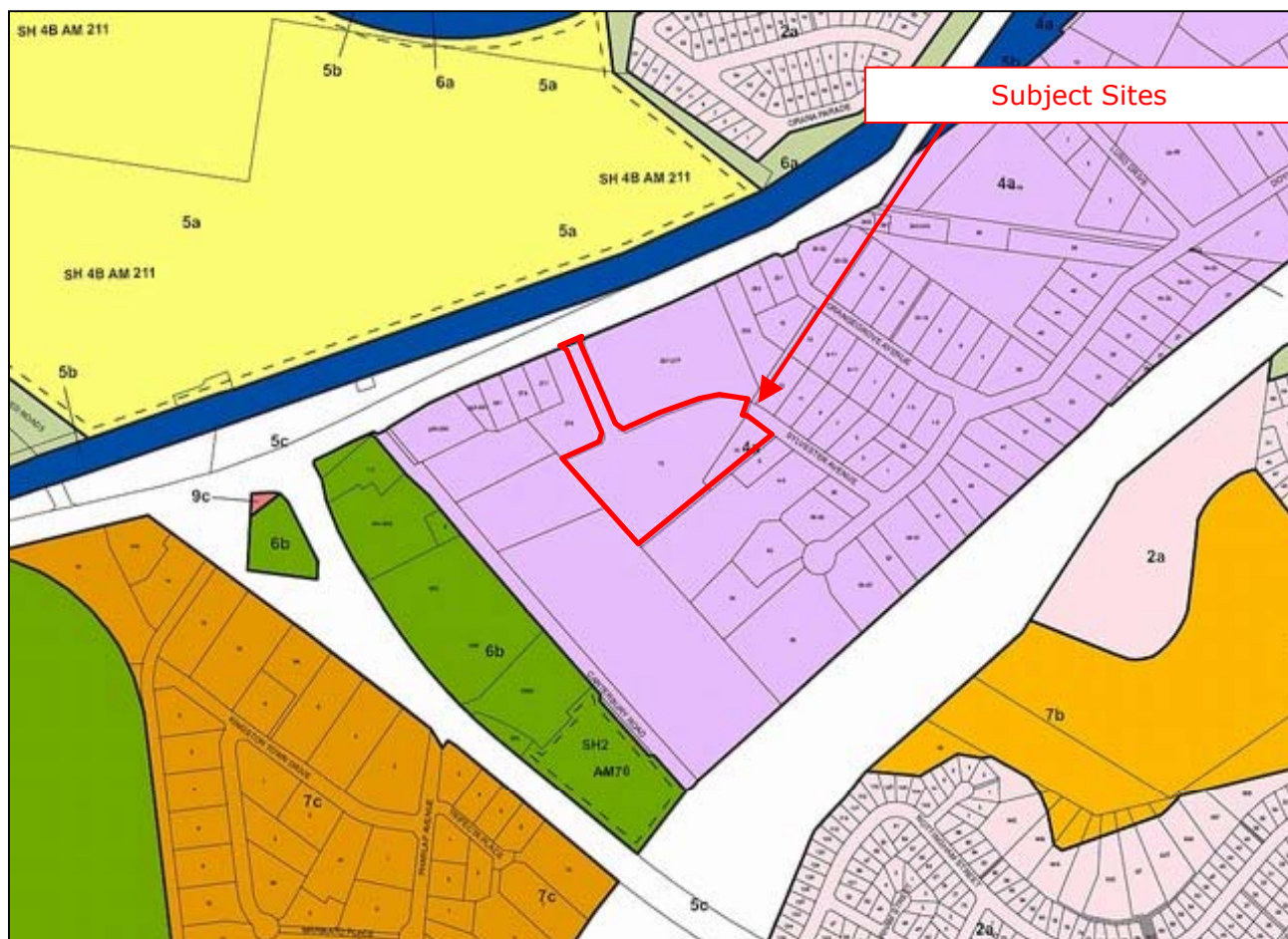


Fig 22: Extract of Wollongong Local Environmental Plan 1990 showing zoning of the subject sites

Clause 9 of WLEP 1990 outlines the objectives for the 4(a) zone, including:

- (a) to cater for a wide range of manufacturing and service activities that will not interfere with the amenity of nearby residents, and
- (b) to allow some diversity of activities that will not prejudice achievement of the objective referred to in paragraph (a) or significantly detract from the operation of existing or proposed manufacturing and service industries or the amenity of nearby residents.

The land use table contained in Clause 9 details permissible developments (with and without consent), those development which are permissible with consent after advertising and satisfying clause 11 and prohibited developments, as shown below.

2 Without development consent

Exempt development.

3 Only with development consent

Development for the purpose of:

advertisements; brothels; cottage industries; dwellings (used in conjunction with industry and situated on land on which the industry is located); forestry; high-tech industries; leisure areas; light industries; mines; recreation areas; recreation facilities; service stations; transport terminals; truck or heavy machinery sale yards; utility installations; warehouses.

4 Only with development consent granted after advertising and satisfying clause 11

Development for the purpose of:

aquaculture; bulky goods sales rooms or showrooms; camp or caravan sites; car parks; child care centres; community facilities; educational establishments; health consulting rooms; helicopter landing sites; hospitals; industries (other than light industries); institutions; intensive agriculture; light industrial retail outlets; motels; places of worship; registered clubs; restaurants; shops (necessary to service the industry within the zone); turf farming; waste management facilities or works.

5 Prohibited

Any development not included in item 2, 3 or 4.

4.6.2 Land use definition and permissibility

The proposed site is defined as Light Industry under Wollongong LEP 1990, which includes:

"an industry (including processes carried out in a laboratory), 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."

This description is supported by the zoning of the land which applies to the current Cookson operations. The current operation at Bulli is located on 4(a) Light Industrial land, and the operations have been in existence on the site since 1968. Council in preparing draft Wollongong Local Environmental Plan 2009 is seeking to retain a light industrial zoning on the land.

The land subject to the proposed development, also lies within the 4(a) Light Industrial zone of WLEP 1990 and we submit that the proposal satisfies the objectives of the 4(a) Light Industrial zone, given that the intended use is a complementary manufacturing activity in an existing industrial estate, which will have minimal environmental implications. The estate is characterised by a range of manufacturing and servicing activities and the proposal is consistent with existing development in the estate.

A range of consultant reports have been prepared that demonstrate that the proposal will not adversely impact on the amenity of nearby residents or surrounding development and therefore meets the key criteria in the defining the proposal as Light Industry. The impact on amenity to the surrounding neighbourhood is an issue that has been considered extensively in the preparation of the supporting documentation for this proposal. The brief for each of the consultants was to address any adverse impacts that may arise from the proposal, and to recommend any mitigation measures if required. The findings of the consultant reports are briefly summarised below to show that the proposed operation will 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 traffic generation. In this regard, it is submitted that the proposal does fit in with the definition of 'Light Industry' pursuant to WLEP 1990.

Please note, the issue of permissibility is subject to further clarification as per previous discussions with the Department of Planning and the subsequent submission provided to the Director-General by Prince Property Consulting.

Acoustic Report

The "Noise Impact Assessment Acoustic Report" prepared by Acoustic Studio (May 2009) considers the construction, operational and traffic noise associated with the proposed refractory facility. In conclusion, Acoustic Studio confirm that *"considering the predicted noise levels under worst-case meteorological conditions, no additional noise controls are required to control operational noise levels during the typical operating scenario for the facility. The proposed construction of the envelope of the building (precast concrete wall panels plus colourbond roof) will be sufficient to control operational noise levels at all residential receiver location.)"* However to ensure that adverse impacts from the ComCast vibration table are avoided Acoustic Studio recommends that this machinery not be used between before 7am and after 6pm. They note that *"with this time restriction in place, it is considered that there will be no operational noise impact resulting from the proposed facility."*

In terms of noise associated with traffic generation, the traffic report (KFW, 2008) confirms that the development will only generate a small number of additional truck movements to the site and hence Acoustic Studio conclude that there will be *"no impact on existing traffic noise levels from the small increase in traffic resulting from the relocation of the facility"*.

In terms of construction noise, Acoustic Studio conclude that construction noise impact is not anticipated to be significant for this project. However it is recommended that a construction noise management plan be implemented.

Air Quality Assessment

Envirodyne Group considered the proposal in terms of the air quality and compliance with the NSW Protection of the Environment Operations Act 1997 and its associated Regulations. Envirodyne concluded the following:

- *"The current manufacturing operations are classified as 'non scheduled' activities as defined by POEO Act, and in their relocation there is no change in the operations or manufactured output volumes that would alter this classification."*

- *The relocated plant to Unanderra will be required to meet conditions within the POEO Act and the Regulations for emissions from 'non scheduled' premises including fumes, pollutants and odours.*
- *The current plant located at Bulli has no history of odour impact on the surrounding residential properties, based on the lack of odour complaints.*
- *Modelling work undertaken using worst case scenarios has indicated that the plant emissions for dust and VOCs from the plant in its new location will comply with the provisions of the Clean Air regulations of the POEO Act. Impact levels beyond the plant boundaries are well within statutory guidelines.*
- *The relocated plant will not increase the levels of pollutants as tabled in DECC Air Emissions Inventories for the NSW greater metropolitan region. This assessment of emissions from the plant show a miniscule contribution to overall pollution levels."*

Visual Impact

The visual impact of the proposed building has been considered by Design Workshop Australia, who conclude that *"there will be no adverse visual impact created from the proposed development"*. The building has been designed to merge into the existing surrounding industrial fabric through elements such as the proposed colour scheme and landscaping. Furthermore, the topography of the site and surrounds assists to encompass the building, in effect reducing the buildings prominence. The majority of residences are more than 350m away. This distance coupled with the industrial context mitigates any visual impact issues.

Waste

BECA carried out a waste study to determine the waste impact of the proposal, with respect to the *Waste Classification Guidelines* from DECC. BECA conclude that *"the manufacturing activities proposed for the new site are not fundamentally different to those carried out by Cookson Plibrico's existing plant. These activities do not generate any special or hazardous wastes, only general solid waste and liquid waste. The major change to the facility in relation to waste is the proposed wastewater treatment plant to handle both process wastewater and sewer/grey water. Given that the new site does not have connection to the sewerage system, this initiative will dramatically reduce the amount of liquid waste that would otherwise have been generated. It also has the potential to reduce the demand for potable water on site.*

In conclusion, based on the current design information, Cookson Plibrico's equipment can be transferred to its new location without significant adverse impacts form generation of production waste. Although no license is required for this proposal under the State Government POEO legislation, Cookson Plibrico is required to obtain approval from the Wollongong City Council for the planned wastewater treatment plant."

Soil and Water Management

BECA conducted a review of the water management for the proposed relocation of the Cookson Plibrico plant. BECA conclude that the *"water management systems by Cookson Plibrico for their new Unanderra plant represent good environmentally sensitive design practice which should not result in any significant adverse impacts. In fact, the proposed systems should result in a net reduction of the facilities demand on both the potable water supply and public sewerage infrastructure when compared to the current Bulli operation."*

Greenhouse Gas and Energy Efficiency Assessment

Envirodyne Group conducted an "Assessment of Greenhouse Gas Emissions" of the proposed development. The analysis of greenhouse gas emissions concluded that the Cookson Plibrico plant is not required to register and report greenhouse gas, energy production and/or consumption annually, as it does not meet the criteria specified in the National Greenhouse and Energy Reporting Act, 2007. Specifically, the plant does not emit more than 25 kilo tonnes of greenhouse gas and produce/consume more than 100 terrajoules of energy. The assessment does not indicate any reason why the proposal should not proceed.

Hazards and Risks

Whamcorp Pty Ltd considered the proposal from a Hazards and Risks perspective. The "*Preliminary Hazard Analysis Report*" prepared by Whamcorp (2009) concluded that the new Cookson Plibrico facility and associated operations present no significant risk and in general the risks are controlled by the relevant Australian Standard.

Stormwater Runoff

Stormwater runoff issues were considered by KFW, who have implemented open channels that will accommodate both excess stormwater runoff from the proposed building, and also from properties up stream to reduce the impact and runoff onto the down slope properties. Any stormwater that leaves the site will first be treated by the use of a Rocla Downstream Defender prior to exiting the site. The proposed stormwater management systems will contain stormwater where required and will not pose detrimental impacts on properties down slope.

Traffic Impact Assessment

The Traffic Impact Statement prepared by KFW considers the existing and proposed traffic and parking conditions and the impact the proposed development is likely to have on the existing conditions in the surrounding road network. KFW conclude that *the streets within the area have ample capacity to cater for the predicted increased traffic generation*. KFW recommends that the heavy vehicle route be via right turn into Orangegroove Ave and left turn from the site onto the Princes Highway. With respect to parking, KFW conclude that the number of parking spaces provided is adequate to cater for the development and is based on the existing development at Bulli.

Conclusion

In summary, the proposal is considered to fall within the definition of light industry, as outlined in WLEP 1990, as the processes will not interfere with the amenity of the neighbourhood. This view is firmly based on the following:

- The history of the operations at the Bulli site are such that it can be reasonably determined that the proposed operation can be suitably accommodated on a light industry site, as for many years the existing facility has successfully operated at its current location with the only identifiable concern being the relatively recent emergence of noise issues, due mainly to residential development encroaching upon the site;

- Any potential for noise or other emission disturbance has been mitigated in the new proposal by internalising the all operations, replacing noisier machinery and limiting the hours of operation for certain machinery. Also, it is considered that the topography and distance from residents will alleviate any potential noise, emission or visual impact concerns;
- Neither the Bulli operation nor the proposed Unanderra operations will require a license or permit from any environmental or other State or Federal agency. This has been confirmed by the Environmental Consultants and also by the Department of Energy and Climate Change, in its correspondence of 24 April 2009 (refer Appendix 5). It is considered that any adverse environmental or amenity operational impact would likely require a relevant license and annual reporting;
- The various consultant reports have fully considered the issues and determined any recommendations required to ensure minimal amenity and environmental impact from the proposed operations at Unanderra. Many of the consultant reports contain minimal recommendations, and hence the proposal in its current form is considered to be reasonably benign, thereby fulfilling with the Light Industry definition. Light industries are permitted with development consent in the 4(a) Light Industrial zone.

4.6.3 Clause 12: Floor Space Ratios

The maximum floor space ratio for development in the 4(a) Light Industrial Zone is 0.5:1. The subject site has an area of 2.397Ha, and the proposed building has an area of 8,000m². Therefore the proposed development has a floor space ratio of 0.33:1, complying with Council's requirements.

4.6.4 Clause 18: Lake Illawarra and the Hacking River

Clause 18 relates to development that may have a potential adverse impact on Lake Illawarra. The proposed development is in the Mullet Creek catchment, which flows into Lake Illawarra. However, due to the drainage and pollution control measures proposed for the development, there are not considered to be any potential adverse impacts on the water quality or ecology of the lake.

4.7 Draft Environmental Planning Instruments

4.7.1 Draft Wollongong Local Environmental Plan 2009 (DWLEP 2009)

Council prepared draft Wollongong Local Environmental Plan 2009 (DWLEP 2009) to replace Wollongong Local Environmental Plan 1990 and was placed on public exhibition from December 2008 until 13 March 2009. Council was accepting submissions on the draft document until 17 April 2009.

DWLEP 2009 proposes to zone the subject site to IN2 Light Industrial (see figure 23). The intent and boundaries of the proposed zones generally reflect the current situation under WLEP 1990.

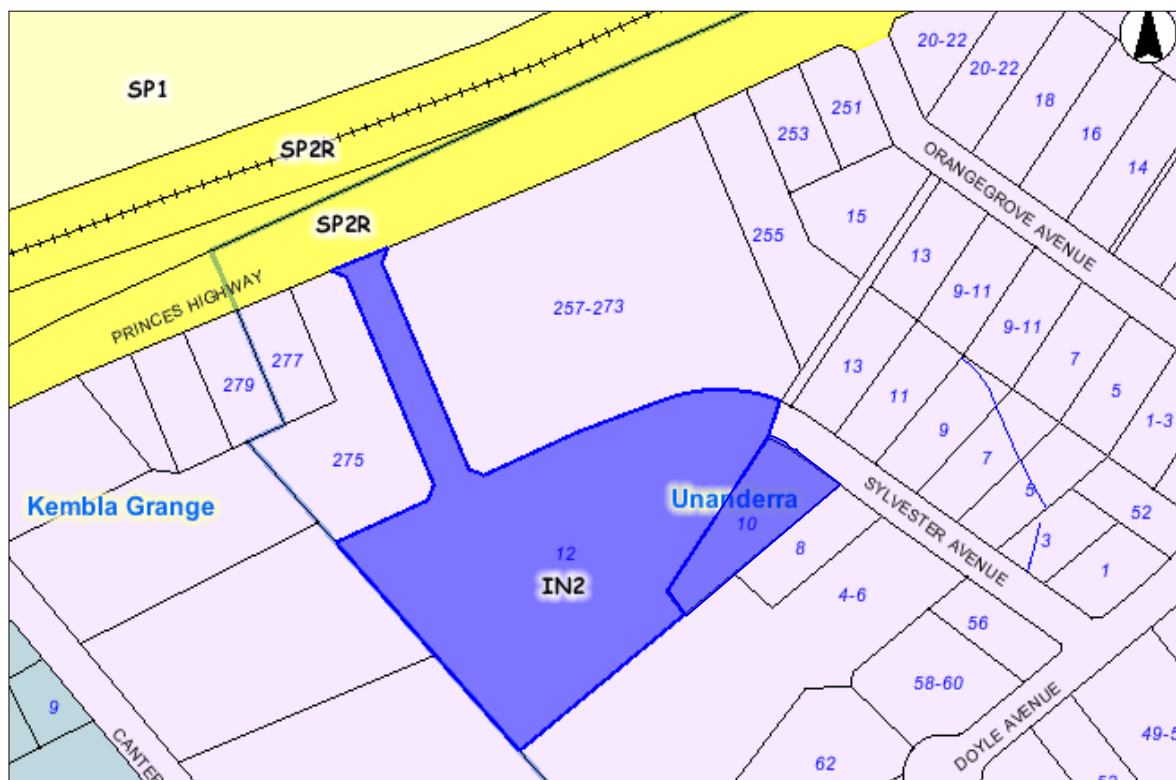


Figure 23: Extract from DWLEP 2009 showing proposed site zoning as IN2 Light Industrial

The proposal will satisfy the definition of “light industry”, which is permitted with consent in the IN2 zone. Light industries are defined as:

“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.”

As outlined in section 4.6 above, the proposal will not interfere with neighbourhood amenity and is therefore defined as a ‘light industry’.

Clause 4.3: Height of Buildings states that the height of a building on any land is not to exceed the maximum height shown on the land of the Height of Buildings Map. For the subject site, the Height of Buildings Map allows a maximum building height of 11.0m. The proposal exceeds this requirement, with a proposed height of 15.7m. Therefore, under DWLEP 2009 a variation statement under Clause 4.6 is required. **Clause 4.6: Exceptions to Development Standards** provides the opportunity to vary development standards, provided adequate justification for the contravention of the development standard. The requirements of Clause 4.6 are summarised in Table 1 below to justify why contravention of the 11m height restriction is proposed:

Table 1: Justification to satisfy Clause 4.6 of DWLEP 2009

Requirements under Clause 4.6		Proposed Justification
(3) Consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:	(a) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and	The proposed building has an overall ground level to ridge height of 15.7m, as shown on Plan 08-030 Dwg DA03 rev A, dated May 2009. This height is required to accommodate the range of machinery which forms part of the Cookson Plibrico's operations. This machinery (which includes the Ball Mill crusher, TEKAS mixer, plastic ram machine and Comcast mixer), requires increased clearance heights to allow for the height of the equipment and additional maintenance area. Photographs of the subject equipment, demonstrating the height requirements are shown in Figures 9-12. The proposed facility has an area of 8000m², a length of 140m and a width of 57.8m. Whilst a height of 11m would be appropriate to accommodate smaller industrial units, the 11m height does not reflect the increased scale of this industrial operation and the need for a height which is proportional to the dimensions of the building footprint.
	(b) that there are sufficient environmental planning grounds to justify contravening the development standard.	The height controls contained within draft Wollongong LEP 1990 seek: (a) to establish the maximum height limit in which buildings can be designed and floor space can be achieved, (b) to permit building heights that encourage high quality urban form, (c) to ensure buildings and public areas continue to have views of the sky and receive satisfactory amounts of sunlight.
		The proposed building will clearly meet such objectives for the following reasons: ▪ The proposed building is located centrally within an industrial area and is surrounded by other industrial buildings of a comparable style. Whilst the floor area of the building does limit the ability to incorporate significant articulated features within the design, a number of features such as the vertical elements on the northern elevation, the awnings and the materials used within the development will add visual interest and promote a high quality urban form. A reduction in the height of the building would not improve the visual appearance of the building, but conversely would result in a building which would not appear visually proportional. ▪ The subject building, which is 8000m² in area is located on a site which is approx. 27000m² in area. Substantial parking and grassed area will surround the building, ensuring that adjacent building and public areas continue to achieve open views towards the sky. ▪ Whilst the proposed building will impact upon sunlight levels on the adjacent site, it is noted that this adjacent land also contains an industrial building with minimal openings on this elevation. The nature of the use and the absence of residential development on such land suggest that the impacts of any overshadowing will be minimal.
(4) Consent must not be granted for development that contravenes a development standard unless:	(a) the consent authority is satisfied that: (ii) the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out.	In terms of public interest the proposal is a positive outcome for the community as it will retain much needed manufacturing jobs in the Illawarra, and, as can be seen from the consultant reports, will have very little detrimental impact on the amenity of the neighbourhood.

Clause 4.4: Floor Space Ratio states that the maximum floor space ratio (FSR) for a building on any land is not to exceed the floor space ratio shown for the land on the Floor Space Ratio Map, which for the subject site allows a maximum FSR of 0.5:1. The proposal is within this requirement, with a proposed FSR of 0.33:1.

Clause 6.5: Acid Sulphate Soils. The eastern portion of the site has been drafted as Class 5 Acid Sulphate Soils. Clause 6.5 of DWLEP 2009 requires an Acid Sulphate soils management plan and concurrence from DECC for development on Class 5 Acid Sulphate Soils that include works within 500m of adjacent class 1, 2, 3 or 4 land that is below 5m AHD by which the watertable is likely to be lowered below 1m AHD on adjacent Class 1, 2, 3 or 4 land. The proposal does not meet this criteria, and therefore under the DWLEP 2009 development consent is not required in relation to Acid Sulphate Soils under clause 6.5.

4.8 Development Control Plan No. 6 – Commercial and Industrial Development

Council's Development Control Plan No. 6 – Commercial and Industrial Development (DCP 6) applies to all industrial development in the Wollongong local government area. DCP 6 was adopted by Council on 3 June 1985. The policy requires all proposals to conform with the provisions of Parts 2: Development Zones and Uses and Part 3: Development Standards, and to take into account those provisions set out in Part 4: Planning for Traffic. Notwithstanding, variations to Part 3: Development Standards may be supported where it is demonstrated that compliance is unnecessary and unreasonable.

Part 2 states *Light industry is permissible in all industrial zones and most business zones but must always be compatible with the locality in which it is developed, particularly when it is located in a business commercial zone. Industrial uses should not break up a shopping frontage nor intrude visually into the commercial street scene.* The proposal will be compatible with the existing industrial nature in the locality and will not have any detrimental amenity impacts on the surrounding area. This is evidenced in the consultant reports that accompany this application, which are summarised in section 7 of this report.

Section 2 of Part 3 outlines development standards for industrial development, Part 4 relates to the planning controls in relation to traffic issues and Part 9 of DCP 6 contains objectives relating specifically to the Unanderra Industrial Park, in which the subject site is located. The manner in which the proposal complies with the primary numeric controls for industrial development, as contained in parts 3 and 4 of DCP 6, are summarised in the following table:

Table 2: Compliance with DCP 6 Provisions

Primary Numeric Controls		Proposed	Comply
Part 3: Development Standards			
Section 2: Industrial Development			
Design	<i>Where industrial buildings are constructed within 3m of property boundaries, masonry construction is required.</i>	The property is more than 3m from the property boundary and is constructed from precast concrete panels.	Complies
Setback	<i>A 3.0 metre strip between the frontage and the building line is to be landscaped and maintained. A 1.5 metre landscape strip along the side boundary side setback is required between the front building line and the alignment of the front of the main building on the site and is desirable right round the site.</i>	The subject site is an irregular lot that is accessed from Sylvester Avenue and is a battleaxe lot from the Princes Highway. Dense screen planting and shade planting has been provided on site between the Sylvester Avenue frontage and the visitor parking spaces, along the Princes Highway side of the parking to the north of the proposed building and in the carpark adjacent to the ROW leading from the Princes Highway. The level of landscaping is appropriate for the subject site, given it's unusual characteristics, and achieves the objectives in DCP 6 in relation to landscaping. Refer the Landscape Plan prepared by Ochre Landscape Architects for further information.	Complies
Fences	<i>No fences or walls except dwarf walls may be erected in front of the building line, nor, in general between the main building and the street. Unsightly areas and open yard activities are to be screened from public view by buildings walls or intensive landscaping</i>	The proposal will include security fencing around the perimeter of the site with lockable gates at the entry points. The visual impact of the fencing is considered to be minimal given the industrial nature of the locality, and that this site is an internal site for the most part, except at the Sylvester Avenue entrance, which is located adjacent to other industrial uses. The boundaries of the subject site will also be defined by dense screen planting, to improve the visual amenity of fencing.	Complies
Advertising	<i>No general advertising structures, other than one identifying the premises and the purposes for which they are used, will be permitted on industrial sites and no bunting or other advertising media may be displayed</i>	No advertising proposed apart from signage identifying the premises and the purpose for which the building is to be used as per the standard. Further details of signage will be identified during the construction certificate stage. There will also be some internal site signage, for example the traffic management signs, but these will not be for advertising purposes.	N/A
Amenity	<i>Where industrial development is proposed in an industrial zone which contains a significant mixture of residential premises, their amenity must be respected by restricting such matters as noise and dust levels, working hours and size of vehicles on the site.</i>	The proposed development is located in a light industrial zone and is surrounded by a range of light industrial uses that are similar to that proposed. The subject site is considerably separated from other land uses such as residential premises. Notwithstanding, a number of consultant reports were prepared that considered the impact of the proposal on the amenity of the surrounding neighbourhood and residential developments further afield. No adverse impacts were predicted, and mitigation measures have been recommended to ensure maintenance of neighbourhood amenity.	Complies

Primary Numeric Controls		Proposed	Comply
Storm-water	<i>All development applications must be accompanied by surface, roofwater and flood retention calculations.</i>	Refer Stormwater plans and documentation prepared by KFW and included as Appendix 6 of this report.	Complies
Discharges	<i>No air or liquid wastes shall be installed without Council consent.</i> <i>Site lighting to be directed to not cause annoyance to neighbours and motorists.</i>	Impacts from any discharges, including noise, liquid and emissions, relating to the proposed use have been considered in detail in the various consultant reports that have been prepared to accompany this application. The consultant reports are included in the appendices of this report. No adverse impacts are predicted from the proposal.	Complies
Part 4: Planning for Traffic			
Site Access	<i>A vehicular driveway (entry and/or exit):</i> <i>i) should have separate entry/exit.;</i> <i>ii) should be more than 6 metres from an intersection; a break in the median strip; the approaches to 'stop' or 'give way' signs;</i> <i>iii) not be within 25 metres of a signalised intersection and preferably not within 90 metres of a signalised intersection on any major road;</i> <i>iv) not be closer than 1.5 metres to site boundaries;</i> <i>v) be located so that any vehicle turning from the street into it or into the street from it can be readily seen by the driver of an approaching vehicle;</i> <i>vi) be relatively level within 6 metres of the site boundary or any pedestrian way – maximum grade 1 in 20.</i>	i) All vehicles, except for heavy vehicles, will only utilise the Sylvester Ave access, which is of sufficient width to allow dual access for vehicles (cars and trucks where required) to enter and leave the site simultaneously. Only heavy vehicles will be permitted egress from the Princes Hwy access handle. This will be ensured via signage and site induction mechanisms. ii) All accesses are located more than 6m from an intersection. iii) The proposed accesses are not within 25m of a signalised intersection, nor are they within 90m of a signalised intersection onto a major road. iv) The driveway from Sylvester Ave is more than 1.5m from the site boundaries, and the Princes Hwy access is via an existing ROW. v) The Sylvester Ave access is located at the end of Sylvester Ave and therefore retains high visibility for vehicles entering and leaving the site, and also to pedestrians in the locality. Heavy vehicle exit from the site via the Princes Hwy ROW will be restricted to left turn only. Visibility in this location is adequate. vi) The proposed driveways are relatively level.	Complies
On Site Circulation	<i>All vehicles should be able to leave the site in a forward direction.</i>	All vehicles are able to leave the site in a forward direction (see turning path plan in the Traffic Impact Statement prepared by KFW – Appendix 11)	Complies

Primary Numeric Controls		Proposed	Comply
Parking	<i>The proposed development is defined as a "light industry", and also incorporates an office component.</i> <i>DCP 6 requires a parking provision of 1 space per 60m² for industrial uses, and 1 space per 40m² for offices.</i>	The proposed building includes the following: Industrial factory: 8,000m² Office component: 810m² Therefore under DCP 6 the proposal requires 133.3 spaces for the industrial component and 20.25 spaces for the office component. Total spaces req'd by DCP 6 = 155.8 Spaces provided = 102	Discussed further in Section 8.4 below
Parking Dimensions	<i>Parking spaces and aisle widths to comply with Council's requirements.</i>	Carparking and traffic circulation areas have been designed in accordance with the Australian Standard. See Traffic report prepared by KFW (2009).	Complies
Part 9: Unanderra Industrial Park			
Objectives relating to the Unanderra Industrial Park	<i>(i) All buildings are to be of a high design standard</i> <i>(ii) the establishment of an attractive and well sited central core to serve the requirements of the Park together with smaller secondary centres to encourage dispersion of recreational activities and greater utilisation of the area as a whole</i> <i>(iii) linking the central core and secondary centres by an internal pedestrian circulation system which will also allow easy access to existing entry and exit points</i> <i>(iv) the introduction of 'Green corridors' to link new circulation systems with the existing infrastructure and logical and restrained planting designed for ease of maintenance</i> <i>(v) the encouragement of existing occupiers to upgrade their developments to match the higher standards of the new Park</i> <i>(vi) storage areas located out of sight from public areas or adjoining properties, if necessary screened by vegetation or screen fences</i> <i>(vii) extensive planting of front landscape strip preferably with a mound up to 1 metre high on reasonably level lots</i>	The proposal is of a high design standard, with architectural plans prepared by PRD Architects. Effort has been made to provide an aesthetically pleasing industrial building, and visual interest has been added by the landscaping. With respect to the other objectives, the site has good linkages, due to its dual frontages to the Princes Highway and Sylvester Avenue. Storage areas for the development will all be located within the proposed building, so it will not be necessary to screen them. The undeveloped areas of the site will be landscaped with trees and shrubs to soften the appearance of the development.	Complies

5 Legislative Framework

Section 5 details other legislation which will apply to the project including legislation relating to environmental performance, traffic requirements and flora/fauna. A discussion of the licensing requirements of the development is also contained within this section.

5.1 Protection of the Environment Operations Act 1997 and Regulations

Dust Emissions:

The current operation at Bulli is not licensed by the NSW Department of Environment and Conservation under the Protection of the Environment Operations Act (POEO) 1997. The operation was previously the subject of a licence, but that licence was surrendered in August 2001 (Notice Number 1010610).

Under the provisions of the POEO Act licenses are required for manufacturing processes where they meet the conditions and activities specified in Schedule 1 of the Act and where they exceed 30,000 tonnes per annum of product and meet the descriptions contained in the Schedule. The "*Assessment of Air Quality Issues*" (2009) prepared by Envirodyne Group Pty Ltd confirms that the Cookson Plibrico development does not incorporate the "*firing of refractory material*" as it does not fire cast products at temperatures associated with conventional refractory products of 1,000 -1,200 deg C. Conversely, the Cookson Plibrico processes involve the curing of castings in gas fired ovens heated at a temperature of 2500 deg C. In addition the total output will be 21,000 tonnes per annum and hence the plant is defined as a 'non-scheduled premise'. NSW DECC will not be the regulatory authority for the development as this function will be revert to Wollongong City Council, which is the regulator of the existing plant at Bulli. This is confirmed in correspondence from the Department of Environment and Conservation dated 24 April 2009, which is contained in Appendix 5.

Envirodyne Group further confirm that the Cookson Plibrico development will meet the conditions of Group C Categorisation, where the plant and processes are to '*.....operate on or after 1st September 2005 as a result of development consent granted to a development application made on or after 1st September 2005*'.

Other Emissions:

Party 4 (Standards of Concentration s for 'non scheduled' premises) lists prescribed compounds and their permitted emissions for a processing plant. The Envirodyne "*Assessment of Air Quality Issues*" (2009) confirms that in terms of the materials used in the manufacture of refractory materials by Cookson Plibrico, none of theses materials are listed within Schedule 6 for dust or particulate matter emission control".

Where impurities are not covered by the POEO Regulations, the Act outlines the general requirements relating to air pollution, which is defined as "*the emission into the air of any air impurity*". An air impurity is defined as smoke, dust, cinders, solid particulate matter of any kind, gases, fumes, odours and radioactive substances.

The Envirodyne report also confirms that the POPEO Act and Regulations require assessment of emissions that are a product of combustion from furnaces, boilers and ovens. As heat for the Cookson Plibrico plant is supplied by natural gas, Cookson Plibrico currently does not have a licence for this operation and it is anticipated that this situation will remain unchanged with the transfer of this heating system to the new plant.

Odour Emissions:

While Clause 129 of the POEO Act relates to scheduled premises, the provisions contained in Clauses 124 - 126 of the Act indicate that the onus is on the proprietors of a manufacturing process not to cause offence regarding of whether the use is scheduled.

The manner in which the development will comply with the requirements of the Protection of the Environment Operations Act, 1997 and Regulations is further discussed in section 7.3 of this Environmental Assessment.

5.2 National Greenhouse and Energy Reporting Act (NGER Act), 2007

The National Greenhouse and Energy Reporting Act (NGER) 2007 requires that companies register and report their emissions of greenhouse gases, energy production and/or consumption annually if their operations meet or exceed the following criteria:

- They own and operate facilities that emit 25 kilotonnes or more of greenhouse gas (CO₂-e) or produce /consume 100 terrajoules of energy, or
- Their corporate group emits 125 kilotonnes or more of greenhouse gas (CO₂-e) or produces/consumes 500 terrajoules or more of energy.

The manner in which the Cookson Plibrico plant will meet the requirements of the National Greenhouse and Energy Reporting Act (NGER) 2007 is discussed in section 7.2 of this Environmental Assessment.

5.3 NSW Industrial Noise Policy

The NSW Industrial Noise Policy sets criteria for the achievement of environmental noise objectives, the first of which accounts for intrusive noise and the second which is intended to protect the amenity of particular land uses.

The intrusive criterion specifies that the equivalent continuous A-weighted operational noise level of the source, measured over a 15 minute period should not be more than 5dB above the measured background level.

The amenity criterion is based on land use type and relates only to industrial type noise and does not include road, rail or community noise. This criterion, which is designed to limit continuing increases to noise levels, specifies that the maximum ambient noise levels within an area from industrial noise sources should not normally exceed the acceptable noise levels appropriate for the type of area

The project-specific noise level is defined as the lower of the intrusiveness and the amenity criteria.

The manner in which the Cookson Plibrico relocated facility will meet the criteria specified in the NSW Industrial Noise Policy is detailed in section 7.4 of this report.

5.4 The Environmental Criteria for Road Traffic Noise, 1999

The Environmental Criteria for Road Traffic Noise 1999, which was prepared by the NSW Department of Environment and Conservation, sets traffic noise criteria which will apply to the proposed development. The criteria contained within this policy which will apply to the proposed development is “*land use developments with potential to create additional traffic on existing freeways/arterials*”.

The manner in which the proposed development will comply with this policy is further discussed in section 7.4 of this Environmental assessment.

5.5 Threatened Species Conservation Act 1995

There are no threatened species known, or expected to exist on the site, as in its undeveloped state, the site is characterised by grassland. It is noted that the site is not identified in Draft Wollongong Local Environmental Plan 2009 as containing any significant vegetation. Hence, it is considered that the provisions of this legislation do not apply to the proposed development.

6 Risk Assessment

This section includes consideration of the potential environmental impact of the project and identification of the key issues which have been the subject of further assessment within specialist subconsultant investigations.

6.1 Description of the Existing Environment

The subject site is sited within the industrial area of the suburb of Unanderra, located to the south west of Wollongong. The site has road access from both the Princes Highway and Sylvester Avenue. The Princes Highway provides a transport link to Wollongong in the north and Dapto in the south and also links to Northcliffe Drive, which provides access to the F6 Freeway. Sylvester Avenue, which has a carriageway width of 12.8m, connects to Doyle Avenue, and then the Princes Highway via Orangegrove Avenue. An access handle which extends from the Princes Highway is also in existence and will provide left-turn only heavy vehicle egress from the site.

The site is currently undeveloped and has a significant fall from the Sylvester Avenue in a northern direction with an approx 10% grade. The site lies within the Mullet Creek catchment.

For the purposes of addressing potential noise, odour or dust impacts on adjoining properties the following observations are made regarding the siting of the plant and the nature of surrounding landuses:

- The site is located within an industrial estate of approximately 190 hectares, which is located between the south coast railway, the Princes Highway (north) and the Southern Freeway (south).
- Developments in the vicinity include a range of industrial, heavy industrial uses and warehouse premises.
- With the exception of two dwellings located in Canterbury Road within the industrial area, the majority of dwellings are located between 300 and 600 metres from the site within three locations being:
 - The Kembla Grange equestrian estate to the south of Northcliffe Drive, in which large residential lots containing an associated equestrian use are located. Residences in this location will be sited approximately 300m from the Cookson Plibrico operations;
 - Within the Berkeley low density residential area to the east of the site and the Southern Freeway. Residential development in this location includes smaller residential lots, predominantly containing single storey detached houses of brick and weatherboard construction. Houses within this estate are located approximately 400metres from the proposed Cookson Plibrico facility in a south-easterly direction and 600m in an easterly direction;
 - Within the Farmborough Heights low density residential areas (Orana Parade) which contains older style detached cottages to the west of the site across the Prince Highway. Dwellings in this estate are sited a minimum of 300m from the proposed plant.

The prevailing wind is south-westerly in the mornings and north-easterly in the afternoons. With regard to meteorological conditions in this location, Envirodyne confirm that the proposed factory building will have its axis in a general NE-SW line, with property on the western side having a higher level than properties to the east.

6.2 Hazardous Materials Risks

This Environmental Assessment has identified the storage of materials on the site as a potential risk which warrants further investigation. Specifically, the proposed operation uses or stores several components which are defined as dangerous goods, including Hexamine, Hexion Durite resin, Resinox, Phosphoric acid, Sodium aluminate solution, Aluminium phosphate, natural gas, LPG and diesel. A *"Preliminary Hazard Analysis Report"* (2009) has been prepared by Whamcorp Pty Ltd to assess the hazards and risks associated with the plant operations and to review the adequacy of the safeguards provided.

The study also confirmed that the operation a number of hazardous materials (Dresinate "rosin soap", Darvan sodium polyacrylate and aluminium grit), added in relatively small proportions to the clays and other materials in the process. Such materials present a weak dust explosion hazard. Other potential risks include flammability/combustibility, toxicity and to a lesser extent corrosivity.

6.3 Greenhouse Gas

As with any industrial process, there is a need to ensure that the Cookson Plibrico facility does not exceed recommended emissions of greenhouse gases, based on annual energy production and/or consumption.

The potential greenhouse gas risks associated with the plant operations are discussed in further detail in section 7.2 of this Environmental Assessment.

6.4 Air Quality and Odour Risk

The operations of the plant necessitate consideration of potential risks associated with the operations and maintaining of the plant and the handling of materials which could potentially result in air pollution. Specifically, this could include residual emissions of contaminants from plant processes including dust and organic compounds. Potential dispersion could arise in relation to dusts, formaldehyde, methanol and phenol and modelling of such is required.

Potential risks also include dust impacts associated with the use of cement products in the castable products. Further, Cookson Plibrico utilise a number of products in its manufacturing processes which have the potential to impact upon employees or surrounding residents due to dust, vapour or odour. Such products include:

- Hexion cascophen and hexamine which is a blend of Glycols, Phenols, (Methyl) Alcohols – Methanol and Formaldehyde. There is a need to ensure that such materials are used in compliance with Occupational Health and Safety Standards to minimise risk of exposure to plant personnel, with particular regard to the need for exhaust ventilation. This product can be characterised by an amine/ammonia type odour;

- Sodium Silicate which is used in the manufacture of refractory products, as it acts as a binding agent with cements.
- Aluminium Orthophosphate which is supplied as a dry powder and which could result in dust emissions if not properly handled, prior to its conversion to a liquid state.
- Phosphoric Acid, which is a strong acid raw material used in the Cookson Plibrico manufacture of RAM products. There is a need to ensure that correct handling procedures are followed due to this product's corrosive and toxicological properties.

In addition, there are materials within the manufacturing process which are not generators of particulate emissions but which have the potential to cause odour beyond the plant boundaries, thus potentially impacting on surrounding residential areas. To assess the level of risk, an *"Assessment of Air Quality Issues"* has been undertaken by Envirodyne (2009) to determine residual emissions from the new Cookson Plibrico plant at Unanderra.

6.5 Potential Acoustic Impacts

The most significant risk associated with any industrial operation is the potential for a facility to impact on surrounding residents as a result of noise. Whilst the siting of the subject facility within an industrial area, and the separation provided to surrounding residences will to some extent minimise this potential impact, there are a number of scenarios which require consideration. This includes consideration of:

- Operational noise produced by the day to day production of the facility;
- Traffic noise produced by traffic associated with the operations of the facility;
- Construction noise associated with the construction of the facility.

Potential acoustic impacts associated with the relocated plant will in some respect be determined by the meteorological conditions which occur in this location, including temperature inversions and downwind conditions. Temperature inversions generally occur at night time and can focus noise at relatively large distances from the noise source. Wind speed and direction can also influence the potential acoustic impacts of the plant.

A further factor which could influence the potential for the plant operations to impact upon residences is the background noise level, which will be lower during the morning (6.00 to 7.00am) and evening periods (9.30pm to 10.30). This risk identification is based on plant operating hours of 6.00am to 10.00pm.

The *"Noise Impact Assessment Acoustic Report"* prepared by Acoustic Studio (2009) notes that a number of the Orana Parade residences have a direct line of sight to the subject site and hence these residences are considered to be the most critical receivers when assessing potential noise impacts. The impact on the dwellings in Canterbury Road is also considered.

Potential noise producing sources within the plant are identified as dust collection fans and localised ventilation fans, together with a range of equipment including:

- a com cast vibro table, which operates approximately once per house for a period of 8 minutes;
- a ball mill which is assumed to operate continuously for the purpose of the acoustic assessment;
- a crusher which is assumed to operate continuously for the purpose of the acoustic assessment.

6.6 Potential Water Quality Impact

The risk analysis which was undertaken as a component of the Environmental Assessment also extended to the consideration of waste water from the plant to ensure that it does not contain any significant levels of toxic or dangerous substances. This issue has been addressed within the “*Water Management Report*” (2009) prepared by BECA, the outcomes of which are summarised in section 7.5 of this Environmental Assessment.

6.7 Waste Generation Risks

Potential risks associated with the project also include the possibility of the manufacturing facility generating hazardous or special wastes. This could include solid waste (putrescible and non putrescible) and liquid wastes associated with the manufacturing processes, the staff facilities, including the sewerage treatment plant.

To address this issue a “*Waste Study Report*” was undertaken by BECA (2009) to determine the environmental impact of the proposal with respect to the waste generation, as discussed in section 7.6 of this Environmental Assessment.

6.8 Potential Visual Impacts

Potential risks associated with the project include the possibility that the site would be visually evident and a significant element of the landscape from key vantage points. To address this, a ‘*Visual Impact Assessment*’ was undertaken by Design Workshop Australia (2009) to determine the visual impact of the proposal, as discussed in section 8.5 of this Environmental Assessment.

7 Key Issues

Section 7 provides a description of the existing environment of the proposed Unanderra plant, including baseline data. This section also contains an assessment of the potential impacts of all stages of the project, such as any cumulative impacts, having regard to the outcomes of the specialist subconsultant investigations and the site and operating conditions. This section also takes into consideration the level of compliance of the development with relevant statutory provisions and technical or policy guidelines.

7.1 Preliminary Hazard Analysis

The "Preliminary Hazard Analysis Report" prepared by Whamcorp (2009) confirmed that the operation uses and/or stores the following dangerous goods:

Table 3: Dangerous Goods Operation and Storage at Cookson Plibrico Plant

Code	Name	Form	Package etc	UN No	Class etc
AB 400a	Hexamine	Solid	25kg bags, max 2,000kg	1328	4.1 PG III
AB 403	Hexion Durite resin (used in Taphole Clay)	Liquid	50,000L heated tank	2810	6.1 PG III, C1
AB 405	Resinox IV 1781	Liquid	IBC, max 2,000L	1866	3 PG III
AB 421	Phosphoric acid	Liquid	IBC's, max 3,000L	1805	8 PG III
AB 467	Sodium aluminate solution	Liquid	IBC, max 3,000L	1819	8 PG II
AB 425	Aluminium Phosphate	Liquid	IBC, max 4,000L	3264	8 PG III
	Natural gas (for ovens and dryers)	Gas	Piped	1971	2.1
	LPG (for forklift fuel)	Liquid	4,200L tank	1075	2.1
	Diesel (for front end loader fuel)	Liquid	7,000L tank	-	C1

Source: Preliminary Hazard Analysis - Whamcorp (2009)

Note: "C1" = combustible liquid C1, classified as dangerous goods for storage and handling.

None of the finished products are dangerous goods

Further, Table 4 lists the hazardous materials used in the operation:

Table 4: Hazardous Materials Used and Stored in Cookson Plibrico Operations

Code	Name	Package etc	Dust explosion?
AM 429	Dresinate "rosin soap"	25kg, max 500kg	Explosive dust St1
AM 452	Darvan sodium polyacrylate	25kg, max 500kg	"Readily combustible" assumed St1
AM 351	Aluminium grit	15kg drums, max 200 kg	Explosive dust St1

Source: Preliminary Hazard Analysis - Whamcorp (2009)

Note: "St1", "St2" and "St3" are classes indicating the degree of violence of a dust explosion, ranging from weak explosions (St1) to violent explosions (St3)

The outcomes of the "Preliminary Hazard Analysis Report" prepared by Whamcorp are summarised as follows;

Hexion Durite Resin:

- Stored in a 50,000 litres tank located outside the main building, under an attached awning.
- Tanker to be parked in a designated bay, designed to contain leaks.
- Driver to wear protective clothing and be able to stop pump immediately.
- Material delivered warm (above 40°C) to facilitate pumping.
- Tank to be located in a bunded compound, capable of holding the entire contents, to comply with AS4452:1997 and AS 1940:2004.
- The tank and bunded compound will be located close outside the building and the adjacent wall will comply with separation, fire resistance and shielding height requirements.
- An awning over the tank, built to fire safety requirements, will assist in preventing rainwater entering the tank.
- The delivery and storage containment will prevent spills from escaping and the fire separation will prevent fire from spreading rapidly to other areas.
- The likelihood of fire is very small; toxicity is not an issue as spills will be contained; the potential for toxic emissions has a low likelihood; and the use presents a very low risk.
- Usage is fixed via piping so risk of leaks are very small. As the material cools it becomes viscous, which further reduces the risk of spills and reduces the risk of the material igniting.

Resinox IV1781:

- Stored in intermediate bulk container (IBCs) in a dedicated flammable liquid bunded compound located outside of the main building, under an attached awning. The IBCs are typically of around 1000L capacity to be handled with a forklift.
- IBCs will be unloaded from trucks and placed into dedicated bunded area, IBCs will meet storage and handling requirements.
- A bunded 1250 litre compound will be provided.
- The IBCs will comply with ADG7 hence the likelihood of failure if dropped from a forklift is extremely small.
- The possibility of spearing a container with a forklift is low as drivers are subject to training.
- The forklift used to handle the IBCs will either comply with the design and construction requirement for use in a hazardous area or the requirements for use of forklifts with packages flammable liquids.
- The pumping of the IBC has a low risk of spillage of a small quantity. As ignition sources are controlled, the likelihood of fire from any spill is low. As a small fire could be quickly extinguished, the risk of spread beyond the immediate area is very low.

Diesel:

- Stored in a 7,000 litre tank located outside the main building, under an attached awning.
- The tanker will be parked in a dedicated bay which will be designed to contain spills within a bunded area, which is capable of holding the entire contents of the tank.
- The wall adjacent to the bunded area will meet the fire separation (AS 1940), fire resistance and shielding height requirements.
- An awning over the tank will assist in preventing rainwater from entering the tank.
- The material is a low combustible liquid kept well below its flashpoint, and hence the likelihood of a fire is very low.
- The only use of diesel is in a low loader, presenting no significant risk.

Hexamine:

- Stored on pallets inside a steel container, located away from sources of heat and accumulations of combustible material.
- The maximum quantity is 2000kg, below the manifest quantity of 10,000kg specified for dangerous goods of that nature. The risk of ignition is low and if involved in a general factory fire would not present a significant heat load.
- Use of hexamine is in relatively small quantities and does not present a significant hazard.

Corrosive Liquids:

- Phosphoric acid and other Class 8 liquids will be stored in IBCs in a dedicated corrosive liquid bunded compound located outside the main building, under an attached awning.
- Storage will comply with ADG47 and will be stored and handled in accordance with AS1380:1994 (storage and handling of corrosive substances). Spill containment for at least 1000L will be provided. The delivery and storage will prevent any spills from escaping to the environment.
- The pumping of the IBC has a low risk of spillage of a small quantity but this presents no risk as it will be contained within the factory.

Hazardous Materials (with a potential dust explosion hazard):

- Aluminium grit will be stored in 15kg drums in an existing purpose built container, with appropriate signage. Rosin soap and polyacrylate will be stored on pallets on racking, away from sources of heat and accumulations of combustible material.
- The materials present a risk that in the event of a dust cloud being formed it may ignite to produce a weak explosion and there is a risk that accumulated layers may also ignite. The prime risk control is "Housekeeping" in AS/NZS 4754:2004 *"Code of practice for handling of combustible materials"*.
- As the handling is in small quantities and localised, the likelihood of a secondary explosion due to widespread accumulated waste is negligible and the risk is not significant.

LPG:

- Receipt and storage of LPG will comply with AS1596 and only trained personnel will be involved. The 4,200L tank is less than the manifest quantity (5,000L) specified for flammable gases and is located as required by the Standard.
- The usage is for filling cylinders on forklifts, which does not present a significant risk.

Natural Gas:

- Natural gas is piped in for use with the "tophat" ovens. All piping and burner controls will be in compliance with AS 5601:2004:Gas Installations" with well established pressure control, burner management etc. so that no significant risk is presented.

The "Preliminary Hazard Analysis Report" prepared by Whamcorp (2009) concludes that the new Cookson Plibrico facility and associated operations *"present no significant risk and in general the risks are controlled by the application of the relevant Australian Standard"*.

SEPP 33 requires that “potentially hazardous” developments be subject to a Preliminary Hazard Analysis (PHA). If the PHA demonstrates that the risk is not significant, “*the development is permissible and can proceed to detailed assessment*”. From the analysis conducted the proposed facility in operation, will not pose a significant risk to surrounding land use and is permissible. Whamcorp confirm that the recommendation to proceed (with the five requirements nominated) is made in conformity with the requirements of SEPP 33.

7.2 Greenhouse Gas Impacts

The Director General’s requirements specify that consideration be given to the effects of direct and indirect greenhouse gas emissions that will be discharged to the environment, as a result of the plant operations at the new site. In addressing this matter, there is also a need to consider potential business risks associated with climate change and the introduction of the Emissions Trading Scheme.

To address this potential risk an “*Assessment of Greenhouse Gas Emissions*” was undertaken by Envirodyne Group Pty Ltd in April 2009, as a component of the Environmental Assessment. This assessment involved an investigation into the following matters:

- Assessment of the potential direct and indirect greenhouse gas emissions that can be discharged to the environment as a result of the plant operations at the new site.
- Consideration of the partial or complete offset of plant emissions through the purchase of certified carbon credits.
- Establishment of operations greenhouse gas benchmarks for the new plant operations.
- Identification of business risks in dealing with climate change and the introduction of an Emissions Trading Scheme.
- Identification of partial compliance and reporting requirements under the National Greenhouse and Energy Reporting Act, 2007.

The production levels, energy consumption and waste generation figures of the plant as contained in the Envirodyne report are summarised in Table 5 below:

Table 5: Production Levels and Waste Generation of the Current Bulli Operations

Item Description – 2008 Production	Quantity
Total production of goods – used for internal use in downstream products and external sales	21,000 tonnes per annum
Natural gas consumption	62,140 Therms
Diesel fuel consumption	1,300 litres
Electricity	1,017,993 kWh
Liquefied Petroleum Gas (LPG)	52,700 litres
Water Usage – sewerage discharge - water consumption	1,200 kLitres 1,700 kLitres
Solid Waste Disposal – mix of paper and cardboard, plastics, metal wastes (welding, offcuts), of which 15% is estimated to be non GHG producing in landfill	894 tonnes per annum.

Source: “*Assessment of Greenhouse Gas Emissions*” (Envirodyne, 2009)

The Envirodyne assessment, which extrapolated data from Cookson Plibrico's existing Bulli operations, confirms that the new plant at Unanderra will generate the total emissions, as detailed in Table 6 below:

Table 6: Predicted emissions from the Cookson Plibrico Unanderra Plant

Emission Type	Description	Total Emissions (tonnes CO _{2-e} pa)
Scope 1	Direct fuel usage	420.9
Scope 2	Indirect Energy Generation – electrical power	906
Scope 3	Indirect energy consumption form: - Waste disposal - Employee and freight transport costs - Indirect energy costs.	4339.3
	Overall total emissions	5,666.2

Source: "Assessment of Greenhouse Gas Emissions" (Envirodyne, 2009)

The analysis of greenhouse gas emissions concluded that the Cookson Plibrico plant is not required to register and report greenhouse gas, energy production and/or consumption annually, as it does not meet the criteria specified in the National Greenhouse and Energy Reporting Act, 2007. Specifically, the plant does not:

- emit more than 25 kilotonnes of greenhouse gas;
- Produce/consume more than 100 terrajoules of energy.

7.3 Air Emissions and Odour Impacts

Envirodyne Group Pty Ltd were engaged to undertake an "Assessment of Air Quality Issues for the Cookson Plibrico Plant". This assessment, which was undertaken in October 2009, examines the issues of contaminants in the air generated by plant emissions. This assessment indicates that the plant will fall within the Group C Categorisation of the POEO Act.

In addition to modelling for prescribed pollutants Envirodyne undertook an analysis of potential risks associated with the use of various products in its manufacturing process. The results of this analysis confirms the following:

- Hexion Cascophen and Hexamine: (Gycols, Phenols, (Methyl) Alcohols – Methanol and Formaldehyde). These materials are used in processes under exhaust ventilation to ensure exposure to plant personnel is controlled to Occupational Health and Safety standards. The modelling results (refer below) confirm whether potential odour impact on surrounding properties through the use of such materials.
- Sodium Silicate: In the liquid form and in its use in refractory products during manufacture, this material produces no vapour or odour emissions.
- Aluminium Orthophosphate: The handling and additional of this material is done in controlled ventilated environments to ensure minimum risk of fugitive dust emissions. These ventilated processes are exhausted to atmosphere via dust collectors.

- **Phosphoric Acid:** The acid is diluted before addition in the manufacturing process. Due to the nature of the Cookson Plibrico operations, the risks of thermal decomposition of the material to possible air impurities is not considered by Envirodyne to be possible. Regulations control the disposal of this material and explicit handling procedures are to be observed. Envirodyne also note that in the manufacture of RAM products, phosphoric acid does not produce a fume or odour component.

Envirodyne undertook computerised predictive dispersion modelling of the residual emissions from the plant to verify whether the emissions would “*cause impact on nearby residential communities and other properties outside of the plant boundary.*” The performance criteria utilised in this modelling is the NSW DECC Policy Document – “*Assessment and Management of Odours from Stationary Sources, January 2001*”. A level 1 Assessment of the plant has been undertaken by Envirodyne to address the provisions of the this policy, which prescribes criteria for odour and ground level concentrations (GLC) that are not to be exceeded at any location beyond the boundary of the facility. Whilst it is noted that the plant will not be a scheduled premises, as part of the modelling exercise, Envirodyne utilised the GLC limits as if the plant was scheduled. The modelling also addresses the worst case scenario for the plant, in which case the Short Term Exposure Limits (STEL) were used to initiate the modelling work.

Table 7 below provides an inventory of the emissions data, whilst Table 8 summarises the total contribution from the relocated plant to the Illawarra ‘airshed’.

Table 7: Emissions Inventory Summary & GLC Criteria

Plant	Exhaust Air Volume (m ³ /sec)	Pollutant	Exhaust @ 15m/sec		Ground Level Concentration (glc)
			Stack dia	Max. Exhaust (mms). Concentration	
Crushing Plant	2.87	Dust	500	5 mg/m ³	330 µg/m ³
Ball Mill - 1 st Fan - 2 nd Fan	0.7 0.5	Dust	330	5 mg/m ³	330 µg/m ³
TEKA Machine - mixer - bagger - skip - bag split - conveyor	0.35 0.65 0.35 0.25 0.65	Dust	450	5 mg/m ³	330 µg/m ³
RAM Machine	0.65	Dust	250	5 mg/m ³	330 µg/m ³
ComCast	0.25	Dust	150	5 mg/m ³	330 µg/m ³
Precast	0.35	Dust	180	5 mg/m ³	330 µg/m ³
Taphole Plant	0.65	Dust resin – formaldehyde methanol phenol	250	5 mg/m ³ 0.0038 mg/m ³ 2.6 mg/m ³ 0.017 mg/m ³	330 µg/m ³ 0.05 mg/m ³ 5.5 mg/m ³ 0.036 mg/m ³

Notes –

a) – mg/m³ is milligram/m³ or 10⁻³ grams/m³

- µg/m³ is microgram/m³ or 10⁻³ grams/m³

- ppm & ppb are parts per million or billion as volume/volume at 25 deg.C and 1 atmosphere.

The Envirodyne group provided the following summary of the results of their modelling work:

Dust emissions from the new plant – the modelling results show that with a conservatively estimated emission rate taken as a worst case scenario, the GLC values represented by the modelling are $6\mu\text{g}/\text{m}^3$ at 1 hour averages and approximately $10\mu\text{g}/\text{m}^3$ at 3 minute averages at two locations where residential housing exists. These values are well below GLC criteria limits of $0.33\text{mg}/\text{m}^3$ required under statutory guidelines.

Formaldehyde emissions from the new plant – the highest level of formaldehyde emissions from the plant will be $6 \times 10^{-7} \text{ mg}/\text{m}^3$ concentrations at ground level. These levels are well below the GLC impact limit of $5 \times 10^{-2} \text{ mg}/\text{m}^3$. These levels are likely to be well below normal detectable levels of analysis of GC/MS laboratory analysis and the modelling indicates that in close proximity to the plant (i.e. the industrial area) the dilution factor from the measured stack emissions is approximately 10^5 .

Methanol Emissions from the new plant - results of the predictive modelling indicate a similar scenario to the modelling outcomes for formaldehyde. The highest level of methanol concentrations are $3 \times 10^{-4} \text{ mg}/\text{m}^3$ in close proximity to the new plant, which are well below the GLC values of $5.5\text{mg}/\text{m}^3$. Similarly, GC/MS analysers would be at their limits of sensitivity to identify those concentrations. There is minimal risk of emissions of methanol as an emission from process plant operations ever exceeding the GLC criteria at both 1 hour and 3 minute averages.

Phenol emissions from the new plant – results of predictive modelling indicate concentrations of $3 \times 10^{-6} \text{ mg}/\text{m}^3$ in close proximity to the new plant, representing dilution of approximately 1,000. Hence, the modelling indicates that the GLC criteria limit of $0.036 \text{ mg}/\text{m}^3$ would not be reached at either the 1 hour or 3 minute averages for concentrations at locations outside the plant boundaries.

Envirodyne confirm that based on the emissions from the existing plant, the total contribution from the relocated plant to the Illawarra 'airshed' will be as follows:

Table 8: Total Contribution from the Relocated Plant to the Illawarra 'Airshed'.

Pollutants from CP Plant	Stack Emissions (see Appendix 2)	Calculated Annual Emissions	DECC Data on Illawarra "Airshed" Pollutants
Dust (PM _{2.5})	0.03 g/s	435 kgs	126 tonnes p.a.
Methanol	0.0022 g/s	0.04 kg	Total VOCs: 6,300 tonnes p.a.
Formaldehyde	0.0000031 g/s	32 kgs	
Phenol	0.000014 g/s	0.2 kg	

Envirodyne concluded the following as a result of their modelling:

- *"The current manufacturing operations are classified as 'non scheduled' activities as defined by POEO Act, and in their relocation there is no change in the operations or manufactured output volumes that would alter this classification.*
- *The relocated plant to Unanderra will be required to meet conditions within the POEO Act and the Regulations for emissions from 'non scheduled' premises including fumes, pollutants and odours.*
- *The current plant located at Bulli has no history of odour impact on the surrounding residential properties, based on the lack of odour complaints.*
- *Modelling work undertaken using worst case scenarios has indicated that the plant emissions for dust and VOCs from the plant in its new location will comply with the provisions of the Clean Air regulations of the POEO Act. Impact levels beyond the plant boundaries are well within statutory guidelines.*
- *The relocated plant will not increase the level of pollutants as tabled in the DECC Air Emissions Inventories for the NSW Greater Metropolitan Region. This assessment of emissions from the plant show a miniscule contribution to overall pollution levels.*

7.4 Acoustic Impacts

The "Noise Impact Assessment Acoustic Report" prepared by Acoustic Studio (2009) undertook an assessment of potential noise impacts associated with the relocated plant to determine impacts associated with operational noise, traffic noise and construction noise. This report was supplemented by correspondence dated 16 October 2009. This assessment included:

- determination of the project specific noise level for intrusiveness and amenity;
- determination of existing background and ambient noise levels around the site and at the closest affected receivers;
- the application of adjustments as necessary to account for the effect of any annoying noise characteristics;
- the predictions of future operational noise levels, taking meteorological into account; and
- a comparison of project specific noise levels and an assessment of impacts.

Surveys which were undertaken included a survey of the existing noise environment at the site and at the nearest residential receivers on Orana Parade. Long term noise monitoring was undertaken for a period of 10 days to establish ambient noise levels. Short term noise modelling was carried out between the hours of 9.30pm and 10.30pm for a 1 day period and between 6.00am and 7.00am for a 1 day period to establish background noise levels at the site and at the Orana Parade residences.

Operational Noise

The acoustic assessment included the prediction of operational noise levels at the Orana Place residential receivers. In undertaking the survey, allowances were made for the attenuation provided by the envelope of the proposed building and the distance from the building to the receiver location. No allowance was made for the barrier attenuation/screening between the proposed building and the residential receiver location due to the direct line of sight between the proposed plant and the Orana Place residences.

Table 9 Comparison of Predicted Operational Noise Levels and Site Specific Noise Level (before corrections for meteorological conditions)

	Assessment Period	Operational Noise Level, LAeq15min	Project Specific Level LAeq15min	Complies?
Scenario 1 Typical	Morning - 0600-0700	37.5 + 5 (intermittent)	43.1	✓
	Day - 0700-1800	37.5	54.5	✓
	Evening - 1800-2200	37.5	47.6	✓
Scenario 2 Worst-case	Morning - 0600-0700	35.5 + 5 (intermittent)	43.1	✓
	Day - 0700-1800	35.5	54.5	✓
	Evening - 1800-2200	35.5	47.6	✓

Source: Nose Impact assessment Acoustic Report, Acoustic Studio, 2009

The results contained in Table 9 above confirm that “the resulting predicted noise levels at the nearest residential receivers are found to comply with the noise criteria.” Further, in supplementary correspondence dated 16 October 2009 Acoustic Studio also conclude “compliance with all relevant noise limits at the Orana Parade residences will ensure compliance with all relevant noise limits at all other residences around the site – including the Canterbury Road properties.”

The impact of meteorological conditions, including temperature inversions and wind were applied to the results. Predicted operational noise level were compared to the lowest measured existing background noise levels at the Orana Place residences (refer Table 10).

Table 10 – Octave Band Assessment of Predictable Operational Noise Levels and Existing Background Noise Levels (including corrections for meteorological conditions)
SCENARIO 2 WORST CASE WITH COM CAST

	dB re 20μPa									
	Overall	Octave band centre frequencies, Hz								
		31	63	125	250	500	1k	2k	4k	8k
Scenario 1: Typical (no ComCast)	77.5 dBL _{Aeq}	79	76	75	77	75.5	71	70	64.5	59.5
Building Attenuation		-8	-8	-9	-11	-14	-15	-17	-18	-21
Area Correction Factor (8000m²)		+39	+39	+39	+39	+39	+39	+39	+39	+39
Distance Attenuation (350m)		-50	-50	-50	-50	-50	-50	-50	-50	-50
Constant		-14	-14	-14	-14	-14	-14	-14	-14	-14
Ground Reflection		+3	+3	+2	+2	+1	+1	+1	+1	+1
Temperature inversion correction		+3	+3	+3	+3	+3	+3	+3	+3	+3
Wind correction		+4	+4	+5	+6	+11	+5	+6	+6	+6
Receiver Sound Pressure Level, dBL _{eq}	50.5 dBL _{Aeq}	56	53	51	52	51.5	40	38	31.5	23.5
Existing Background Noise at 6am, DbL ₉₀	55.5 dBL _{A90}	63.0	59.1	64.6	52.4	46.3	50.7	47.5	38.2	30.4
Compliance at 6.00am	Yes	✓	✓	✓	✓	X	✓	✓	✓	✓
Existing Background Noise at 10pm, dBL ₉₀	52.5 dBL _{A90}	65.2	59.7	60.1	52.1	48.2	47.0	43.1	38.1	34.1
Compliance at 10pm	Yes	✓	✓	✓	✓	X	✓	✓	✓	✓

Source: Nose Impact assessment Acoustic Report, Acoustic Studio, 2009

The results above indicate that under worst case meteorological conditions, there is only one predicted exceedance of the existing background noise level at the Orana Place residences of between 3 and 5dB at 500Hz. Acoustic Studio note that this prediction assumes a worst case scenario for wind effects, combined with temperature inversions and lowest background noise levels under calm weather conditions. It is concluded that "given these conservative assumptions we do not consider the exceedance under these circumstances to be significant".

The noise impact assessment acoustic report identified the ComCast Vibro Table as being the highest noise source within the plant. This equipment operates once per hour for 8 minutes, with the highest noise output occurring in the first 34 minutes. The study provides the following summary of predicted operational noise levels and background noise levels, incorporating the impact of this equipment under typical conditions.

Table 11 – Octave Band Assessment of predictable Operational Noise levels and Existing Background Noise Levels (including corrections for meteorological conditions)

SCENARIO 2 WORST CASE WITH COM CAST

	Overall	dB re 20µPa								
		Octave band centre frequencies, Hz								
		31	63	125	250	500	1k	2k	4k	8k
Scenario 2: Worst-case (ComCast)	95 dBL _{Aeq}	68.5	83.5	100.5	98	91.5	90	83.5	79	70
Building Attenuation		-8	-8	-9	-11	-14	-15	-17	-18	-21
Area Correction Factor (8000m ²)		+29	+29	+29	+29	+29	+29	+29	+29	+29
Distance Attenuation (350m)		-50	-50	-50	-50	-50	-50	-50	-50	-50
Constant		-14	-14	-14	-14	-14	-14	-14	-14	-14
Ground Reflection		+3	+3	+2	+2	+1	+1	+1	+1	+1
Temperature inversion correction		+3	+3	+3	+3	+3	+3	+3	+3	+3
Wind correction		+4	+4	+5	+6	+11	+5	+6	+6	+6
Receiver Sound Pressure Level, dBL _{eq}	59 dBL _{Aeq}	35.5	50.5	67.5	63	57.5	49	41.5	36	24
Existing Background Noise at 6am, Db _{L90}	55.5 dBL _{A90}	63.0	59.1	64.6	52.4	46.3	50.7	47.5	38.2	30.4
Compliance at 6.00am	Yes	✓	✓	X	X	X	✓	✓	✓	✓
Existing Background Noise at 10pm, dBL ₉₀	52.5 dBL _{A90}	65.2	59.7	60.1	52.1	48.2	47.0	43.1	38.1	34.1
Compliance at 10pm	Yes	✓	✓	X	X	X	X	✓	✓	✓

Source: Noise Impact assessment Acoustic Report, Acoustic Studio, 2009

Table 11 above confirms that considering the predicted octave band noise levels under worst case meteorological conditions, there is a predicted exceedance of the existing background noise level at the Orana Parade residences by 2 to 11dB at 125 Hz to 1kHz with the Com cast Vibro table operating.

In conclusion, Acoustic Studio confirm that *"considering the predicted noise levels under worst-case meteorological conditions, no additional noise controls are required to control operational noise levels during the typical operating scenario for the facility. The proposed construction of the envelope of the building (precast concrete wall panels plus Colourbond roof) will be sufficient to control operational noise levels at all residential receiver location.)"*. However to ensure that adverse impacts from the ComCast table are avoided Acoustic Studio recommends that this machinery not be used between before 7am and after 6pm. They note that *"with this time restriction in place, it is considered that there will be no operational noise impact resulting form the proposed facility."*

Traffic Noise:

The "Noise Impact Assessment Acoustic Report" also addressed potential noise impacts associated with traffic, inclusive of car movements of staff arriving and departing at shift changeover and truck movements associated with the delivery and distribution of materials.

The Environmental Criteria for Road Traffic Noise 1999 specifies that *"traffic noise arising from the development should not lead to an increase in existing (traffic) noise levels of more than 2dB"*. The traffic report (KFW, 2009) confirms that the development will only generate a small number of additional truck movements to the site and hence Acoustic Studio conclude that there will be *"no impact on existing traffic noise levels from the small increase in traffic resulting form the relocation of the facility"*.

Construction Noise:

Based upon the Environmental Protection Agencies "Environmental Noise Control Manual" construction noise limits are set as 5dB(A) above the daytime background rating level – giving a maximum of LA10,15min of 54dB(A) at the Orana Parade residences. Acoustic Studio notes that construction noise varies and is dependent upon the activity and the number of pieces operating at any given time. Based upon the typical power outputs of equipments which are typically in the order of 110dB(A) and the distances between the site and the nearest residence, Acoustic Studio conclude that construction noise impact is not anticipated to be significant for this project. However it is recommended that a construction noise management plan be implemented.

7.5 Water Management

BECA was engaged to prepare a "Water Management Report" (2009) to assess the water management systems of the new site with respect to the relevant statutory requirements and guidelines, relating to water use and sources, waste water, water reuse, rainwater harvesting and stormwater management. This report confirms that the estimated daily water discharge will be as follows:

Domestic Sewage (toilets)	1,400 L/day
Domestic Grey Water (showers etc)	2,400 L/day
Process water (mostly hosing down of mixing hoppers)	400 L/day
Total Estimated Water Usage per day:	4,200 L / day

This figure represents a relatively small process water usage for the plant. It is intended that an on site package treatment plant be provided to treat the domestic sewage/grey water and the process waste water to a tertiary level, suitable for reuse on the site and/or discharge to the site stormwater system. All site wastewater would be directed to the package treatment plant, where it would be treated to a high tertiary level consistent with all relevant Australian Standards. The water will then be further diluted through the rainwater collection tanks and can be reused on site (to irrigate landscape areas, flush toilets) or discharge direct to the stormwater system. Wollongong City Council will be responsible for the final approval of this system.

BECA confirm that the grit/sludge produced from the water treatment process can be either stored and removed by tanker to Veolia's Unanderra plant or can be dried and placed on site in an appropriate location.

An analysis of the process waste water stream was conducted by an independent laboratory on behalf of BECA. This analysis indicates that *"there are not any significant levels of toxic or dangerous substances contained in the water, although there are a few components requiring further consideration in the design of the on site package treatment plant. These include the elevated levels of oils and greases, alkalinity as (CaCo3), pH 11.2 and the suspected solids. However, discussion with a number of water treatment plant manufacturers indicate that all of these components can be satisfactorily dealt within the normal parameters of the plant design."*

The new facility will incorporate a rainwater harvesting system, whereby a 30,000 litre storage capacity will be dedicated to use in flushing toilets, external wash down and irrigation. BECA confirm that this system will result in a significant reduction in the potable water demand of the facility and will significantly improve the current operating conditions.

BECA conclude that the *"water management systems by Cookson Plibrico for their new Unanderra plant represent good environmentally sensitive design practice which should not result in any significant adverse impacts. In fact, the proposed systems should not result in a net reduction of the facilities demand on both the potable water supply and public sewerage infrastructure when compared to the current Bulli operation."*

7.6 Waste Generation

A "Waste Study Report" was undertaken by BECA (2009) to determine the environmental impact of the proposal with respect to the waste generated from the proposal, to determine if any hazardous or special wastes are generated. Particular consideration was given to the "Waste Classification Guidelines" prepared by the Department of Environment and Climate Change. This report classified the various types of waste produced, as follows:

General Solid wastes (non Putrescible):

- Damaged castings or out of date bag materials;
- Residual material stuck to the Comcast or Precast mixers after a batch and then removed during the cleanout;
- Spillage of raw materials. Some spillages are recycled back into the process, whilst the remainder are swept up and discarded. Taphole Clay spills (containing resin) are recycled back into the system;
- General office waste;
- Laboratory samples of cast materials.

The types of non –putrescible waste is summarised in table 12 below:

Table 12: General Solid Waste (non-putrescible)

Criteria	Description
Type of Solid Waste	• Alumina silicate aggregates (monolithic products) from crushing bauxite containing ~80% alumina • Solids contain various composition from 30-92% alumina (Al_2O_3), with silicates making up the balance • Sweepings include clays, alumina cements, deflocculants, silica, off-spec products Taphole clay spills (containing resin) are recycled back into system • Off-spec products • Used laboratory-tested block samples • Paper bags that cannot be recycled due to residual product (non dangerous goods)
Quantity	• 3 skips per week (total volume of each skip = $15m^3$) • $0.5m^3$ lab scraps • $1.5m^3$ general office waste per week
MSDS Review	• Inert, non-hazardous, non-restricted solid waste (i.e. bauxite, calcium aluminate cement, clay, mullite and silica fumes).

Source: Waste Study report, BECA 2009

General Solid waste (putrescible):

BECA confirms that depending on the detailed design, the waste water treatment plant (WWTP) may generate a solid waste stream consisting of grit and screenings. This would typically be $0.1-0.5m^3$ recovered once per week.

Liquid Waste:

BECA confirms that sources of liquid waste are:

- Wash down of the Comcast, Precast and Ram mixers, which are washed down after each batch, normally twice per day which amounts to 400 litres per day.
- Sewer and grey water from the site which will generate up to 4000 litres per day.

Both these sources will be piped to the WWTP which will generate sludge, which will vary in volume from 0.2% to 10% of the total capacity, equating to 10-500 litres per day. The sludge will be held in a storage tank and removed for disposal as required.

BECA conclude that *“the manufacturing activities proposed for the new site are not fundamentally different to those carried out by Cookson Plibrico’s existing plant. These activities do not generate any special or hazardous wastes, only general solid waste and liquid waste. The major change to the facility in relation to waste is the proposed wastewater treatment plant to handle both process wastewater and sewer/grey water. Given that the new site does not have connection to the sewerage system, this initiative will dramatically reduce the amount of liquid waste that would otherwise have been generated. It also has the potential to reduce the demand for potable water on site.*

In conclusion, based on the current design information, Cookson Plibrico’s equipment can be transferred to its new location without significant adverse impacts from generation of production waste. Although no license is required for this proposal under the State Government POEO legislation, Cookson Plibrico is required to obtain approval from the Wollongong City Council for the planned wastewater treatment plant.”

8 Development Considerations

8.1 Stormwater Management

Concept stormwater drainage plans have been prepared by KFW (Ref: KF109450, dated: 14/07/09) to address the site runoff and runoff entering the site from Sylvester Avenue. The site lies within the Mullet Creek catchment in an on-site exclusion zone, as specified by Wollongong City Council. It is intended that the site will discharge site runoff to the Princes Highway via a 120m long open swale drain which is adjacent to the proposed access road.

Wollongong City Council provided a letter dated 15 March 2009 (Appendix 4) that states requirements for Stormwater Management. KFW have prepared correspondence to accompany the Stormwater Plans (both documents are included as Appendix 6 of this report), and the manner in which these documents address Council's requirements is summarised below:

- a) *Issue: On site detention should be provided for the subject development in order to limit the post development discharge from the site to the pre-developed state for all storm events up to and including the 100 year ARI. It is acknowledged that the site lies within an OSD concession zone, however due to localised flooding issues immediately down slope of the subject site, all post development flows from the proposed development need to be limited such that there is no increase in flood risk to down slope properties. In this regard, the stormwater plan should incorporate a suitably designed on site detention storage system in accordance with Council's Drainage Design Code and On-Site Stormwater Detention Code.*

Comment: KFW confirm that the existing 1% AEP and PMF storm flows have been checked and drainage structures designed to cater for this flow. Flows will be directed to an open channel within the boundaries of the site. The 1 in 100 year storm event flows will be contained within this channel (See KFW plan C01).

- b) *Issue: Demonstrate with drawings that the 100 year ARI surface flows from the site that may by-pass the on site detention system are directed and contained within the channel.*

Comment: The 100 year ARI surface flows from the site will be directed to the open channels within the site (see KFW plan C01).

- c) *Issue: Demonstrate with drawings and calculations that the dish drains upslope of the proposed building (on the south-east side) can adequately cater for the contributing upslope surface runoff for all events up to and including the 100 year storm and therefore not impact upon the proposed building.*

Comment: In their letter dated 22 May 2009, KFW confirm that upstream runoff has been catered for via a proposed channel diverting this water around the site.

- d) *Issue: Indicate on a plan that a minimum 0.2m freeboard is available between the 100 year ARI top water level in the channels/dish drains and the floor level of the proposed building.*

Comment: KFW confirm that the 1 in 100 year storm event flows will be contained within the open channel, and will therefore not increase the risk of flooding to the proposed building or to properties down slope. The dish drain has been designed for the 1 in 100 year flow from upstream properties.

- e) *Issue: Provide details on the proposed vehicular entrance off Sylvester Avenue. The proposal shall also consider the stormwater runoff from the roadway and how this will be catered for both on the site and within the road reserve, such that no increased flooding impacts will occur to downstream properties.*

Comment: As detailed on KFW plan C05, a concrete drain is to be provided to ensure water flows from Sylvester Avenue do not pass over undisturbed areas or enter the sediment basins. Upstream flows from Sylvester Avenue will be diverted to the concrete drain via a concrete spillway and raised concrete threshold.

- f) *Issue: Provide details on the proposed channel modifications including existing/proposed levels, longitudinal and cross-sections, channel/headwall transition, scour protection and calculations on the capacity of the channel for a 100 year ARI event.*

Comment: Details regarding the retaining walls and channels have been included in KFW plan C04.

- g) *Issue: The location of the proposed substation for the development shall be clearly identified on a plan. Note the location of this substation shall take into consideration the localised flooding problem at the Princes Highway frontage, and hence Council's DCP 54 requirements.*

Comment: The substation will be located on site at Sylvester Avenue, close to the boundary with the upside property. The electrical engineering design is only part underway, but Council's concerns are noted and the substation will not be impacted by flood waters, as this issue among others is fundamental to the electrical engineering design.

- h) *Issue: It is recommended that the proposed access road off Princes Highway be fully sealed (e.g. asphalt/concrete) to minimise any potential water quality issues that may arise as a result of the current proposal (i.e. loose gravel being transported into the stormwater system).*

Comment: The northern portion of the right of carriageway will be bitumen access and gravel for the remainder of the access way. The use of channels and the northern bitumen portion will lessen the likelihood of adverse water quality issues as a result of the current proposal.

- i) *Issue: The site is part of Allan's Creek catchment and any stormwater leaving the site should conform to the ANZECC water quality guidelines for "recreational use".*

Comment: KFW have confirmed in their correspondence dated 22 May 2009 that on site stormwater will be treated by the use of a Rocla Downstream Defender prior to exiting the site.

- j) *Issue: The proposed encroachment of the building upon the easement for batters as shown on Deposited Plan 1064872 shall be clearly explained and supported with documentation on the extinguishment of this easement.*

Comment: Legal advice has been obtained from Rosier Partners in relation to the effect of the easement for batter said to be appurtenant to Lot 1 DP1064872 (i.e. part of the subject site). The legal advice is included in Appendix 7 of this report. Rosier Partners confirms that, in short, the hand drawn easement is an error. The easement actually burdens Lot 207 (the adjacent Coates Hire site), and the batter and its easement are to the benefit of the subject site. Therefore the encroachment of the building on the easement for batter is acceptable. It is intended that this anomaly will be corrected by the Surveyor, subject to the approval of this application.

BECA have undertaken an assessment of the proposed system in the "*Water Management Report*" (2009) and concluded that the system will contain appropriate design features which will aid in the improvement of runoff water quality. Specifically, the concept will allow the swale to be planted with a combination of native grasses and suitable watercourse vegetation. This will allow for a primary treatment process to occur, removing a large portion of sediments and potentially some other minor contaminants from the low flow and first flush, thus improving water quality.

8.2 Sediment and Erosion Control

KFW have prepared Soil and Erosion Control plans and measures to be implemented during the construction of the proposed building (refer plans prepared by KFW, job no KF109450, drawing no C05, rev A, dated 15/07/09). The sediment and erosion control measures include the implementation of sediment fencing along the boundaries, the construction of sediment basins and catch drains, restricting the distance between stockpiles and kerb and gutter systems, and adequate drainage measures to be constructed early in the sequence of operations to prevent site erosion during storm periods.

8.3 Traffic Impacts

A *Traffic Impact Statement* of the proposed development was prepared by KFW in July 2009 and was accompanied by supplementary information in November 2009. This report predicts the traffic generation for the development, based on the "*RTA's Guide to Traffic Generating Developments*", as shown in Table 13.

Table 13: Predicted Peak Hour Traffic Generation

Peak Hour Traffic generation			
Usage	Area m ²	Generation Rate	Total Trips/ Hour
Offices	900	2/100m ²	18
Industrial Building	8,000	0.5/100m ²	40
Total			58

Ref: *Traffic Impact Statement, KFW, 2009*

KFW conclude that the peak hour traffic generation of 58 vehicles per hour is conservative due to the staggering of work hours for office and factory workers.

The site is located at the end of Sylvester Avenue, which has a carriageway width of 12.8m. This street connects to Doyle Avenue, Orangegrove Road, Nolan Street and the Princes Highway, which all have wide carriageways to cater for heavy vehicles. All vehicular access to the site will be provided via Orangegrove Road, Doyle Avenue and Sylvester Avenue. The site also contains an access handle from the Princes Highway. This access handle is burdened by a 10 metre wide and variable Right of carriageway which permits access to a number of other industrial sites on the western side of the access handle. The only vehicular use of the access handle in conjunction with the proposal will be for heavy vehicle egress from the site (refer to the Traffic Management Plan and Turning Path plans included as Appendix D of the Traffic Impact Statement prepared by KFW). Vehicles utilising this egress will be 12.5m long HRVs which can negotiate this turn in accordance with AS 2890.2.

KFW have undertaken a review of the Orangegrove Avenue and Princes Highway intersection, with a one hour survey undertaken to check on turning movements and capacities. This analysis (*Traffic Impact Statement, 2009*) confirms that the right turn lane into Orangegrove Avenue from the Princes Highway demonstrated a maximum queue length of 3 vehicles during the survey, with a capacity of 10 vehicles available. Hence KFW conclude that the observations of the intersection operation is well below capacity. Furthermore, in accordance with the RTA requirements KFW are undertaking a SIDRA Analysis for the existing intersection condition, the predicted traffic increase due to the development and predicted traffic conditions for the year 2020. At the time of lodgement, the SIDRA Analysis had not yet been completed, and will be lodged under a separate cover.

The Traffic Impact Statement also confirms that the route to the site will be from the F6 via Northcliffe Drive to the Princes Highway and then Orangegrove Road. The turning circles for vehicles were checked over the route and were found to be satisfactory as contained in Plan reference KF 109450/C07 & C08, appended to the "*Traffic Impact Statement*" (KFW, 2009).

A meeting was held on 29 June 2009 at the RTA's Wollongong office to discuss issues raised by the RTA in relation to the proposed Cookson Plibrico relocation project at Unanderra. At that meeting the RTA expressed a reluctance to support any use of the access handle for ingress or egress to the Princes Highway of any vehicles, and was primarily based on public safety concerns. Initial plans for the proposal included the provision of parking spaces along the access handle and also the opportunity for all vehicles to enter and leave the site from the Princes Hwy via the access handle. The RTA's concerns were acknowledged and considered, and consequently the proposal has been amended by (1) removing the car parking spaces along the access handle, (2) removing the unrestricted vehicular access/egress to/from the access handle and (3) proposing left hand turn egress of heavy vehicles only. It is much safer for heavy vehicles to be able to enter the site from Sylvester Avenue to the loading area, and egress only from the access handle by turning left onto the Princes Hwy. This also eliminates the need for large vehicles to manoeuvre on site for egress via Sylvester Avenue. While public safety external to the site is important, so too is the internal site safety for employees and visitors to the Cookson Plibrico operations.

The design of the proposal includes a strategic layout of parking spaces to ensure that the access handle will only be utilised by heavy vehicles. The visitor parking bays have been provided as close as possible to the Sylvester Avenue entrance, and the parking spaces have been arranged to encourage visitor vehicles to also exit via Sylvester Avenue. The only vehicles that will go past the visitor bays are the employees or contractors who will all go through OH&S induction procedures. During induction all employees and contractors (including delivery vehicle drivers) will be instructed on the limitations to the access handle. These limitations will be implemented as part of the overall operational policies of Cookson Plibrico, and will ensure that regular vehicles do not utilise the access handle. Furthermore, signage will be posted as appropriate to alert users of the access handle as to the limitations.

The RTA's concerns relating to the access handle are acknowledged, however it is considered that a reasonable compromise has been made by removing the originally proposed parking and general vehicular access from the handle, and through the attempt to control the access handle use as much as possible through the site layout. The subject site having two points of access (one being the access handle to the left turn only for heavy vehicles) is integral to the Cookson Plibrico operations. Two other properties also benefit from this legal right of way as identified in the Deposited Plan 1064872 and closure and/or restriction of this access/egress would be an unreasonable outcome for all parties. Cookson Plibrico have undertaken extensive searches in the Illawarra for the relocation of its existing operations at Bulli and identified it as the most appropriate site. Cookson Plibrico have indicated that, if heavy vehicular access to the Princes Highway via the access handle is not granted, then the company will have no option but to relocate, probably, outside of the Illawarra (thereby reducing manufacturing employment in the region). From a public benefit point of view this is an undesirable outcome. In weighing up the public safety concerns held by the RTA and the internal site operations of Cookson Plibrico from a safety and efficiency perspective, it is considered that the proposal presents the most reasonable outcome. Every effort has been made to ensure the safety of the Princes Hwy through-traffic by the intersection modifications, and by restricting egress from the site at this point for heavy vehicles only, which will equate to approximately 4 movements per working day. The Traffic Impact Statement prepared by KFW confirms that the sight distances for vehicles exiting the site exceeds the minimum requirements, and that heavy vehicles can enter the highway turning left into the outside lane and not encroach onto the inside lane through traffic (refer turning movement plan included in Appendix D of the Traffic Impact Statement).

Therefore, in conclusion it is considered that the proposal presents the most appropriate outcome for traffic management when taking into account the RTA's views and the operational and safety requirements of Cookson Plibrico.

8.4 Carparking Provision

The carparking requirements for the proposal are detailed in the Traffic Impact Statement prepared by KFW (2009). Wollongong DCP 6 requires the provision of 155.8 spaces, and the proposal incorporates 102 carparking spaces. While it is noted that the proposal does not comply with the parking requirements of DCP 6 it is argued that the number of spaces provided meets the likely car parking utilisation rates based on the actual usage of the existing site at Bulli. This comparison with an exact usage of a proposed facility is an accepted approach to likely car parking generation (eg. Section 5 'Parking Requirements for Specific land Uses' of the RTA's document *Guide to Traffic Generating Developments* for a range of uses). In this circumstance, the more general car parking generation requirements of DCP 6 are considered unnecessary and unreasonable for the proposed development type.

As outlined in the Traffic Impact Statement, KFW indicate that the following carparking requirements apply to adequately cater for the actual building usage (at the peak period, being the shift changeover around 2.00pm) are:

<i>Office requirement</i>	40
<i>Industrial requirement (30 per shift)</i>	55 at changeover
<i>Visitors</i>	7
Total required	102

Therefore, the provision of 102 parking spaces on site is adequate to cover the peak access time. It is also noted that the original design of the proposal incorporated significantly more parking spaces, but the parking spaces were removed from the access handle in accordance with the RTA requirements.

Furthermore, the RTA Guidelines for Traffic Generating Developments recommend the provision of 1.3 spaces per 100m² of gross floor area. No additional parking provision is required where the office space is less than 20% of the floor area. Therefore under the RTA Guidelines the proposal would require the provision of 115.7 spaces (based on an 8,900m² building, in which the office component makes up 11.25% of the floor area). Therefore, while the proposed parking provision is less than that required by the RTA, it is justified in the Traffic Impact Statement based on the current operations at Bulli.

8.5 Visual

A Visual Impact Assessment was undertaken by Design Workshop Australia (ref: 190, dated: 30 April 2009, Appendix 13) incorporating a photographic analysis, identification of the existing environment, site visibility and evaluation of the visual impact viewed from various locations. Design Workshop confirm that the site is surrounded by industrial development on all sides, with the south coast train line and the Princes Highway to the north isolating the site from any residence by more than 300m. Furthermore, the F6 Expressway to the southeast of the site separates the proposal from any residential areas within the suburb of Berkeley. The existing topography and adjacent buildings allows the proposal to be camouflaged into the existing industrial context.

The proposal includes flues that are approximately 3m above the building's gutter line. Design Workshop Australia note that these pose no visual impact due to their position on the façade and the length of building. The flues, as with the building, will merge into the surrounding context, natural and built.

The proposal does not include any signage and advertising media, other than some internal site signage, for example the traffic management signs, but these will not be for advertising purposes and will not have any impact on external properties. Therefore, any signage will be the subject of future applications.

Design Workshop Australia, concludes that *there will be no adverse visual impact issues associated with this development*. The building has been designed to merge into the existing surrounding industrial fabric through elements such as the proposed colour scheme and landscaping. Furthermore, the topography of the site and surrounds assists to encompass the building, in effect reducing the buildings prominence. The closest residences are more than 350m away. This distance coupled with the industrial context mitigates any visual impact issues.

8.6 Landscaping

The proposed development includes landscaping treatments as outlined in the landscape plan (ref: 1134-LD01, dated: 19/05/09) and associated correspondence (dated 22 May 2009) prepared by Ochre Landscape Architects, and included as Appendix 16 of this report. The landscape plan incorporates shade tree planting that will provide shade to the proposed parking areas as required by Council's Development Control Plan No. 6 (DCP 6), with the exception of the western carpark. The western carpark has been designed to accommodate the site gradient and has a resultant stepped arrangement. Therefore, as outlined in the letter from Ochre Landscape Architects dated 22 May 2009, tree planting in this location was not possible. However, shrub and tree planting provided to the boundary of the carpark will provide a degree of shading.

It is noted that Council's DCP 6 requires 1.5m of landscaping around the property's perimeter. However, this was not possible in this case for a number of reasons, including the following (as outlined in the correspondence from Ochre Landscape Architects dated 22 May 2009):

- The open drainage channel along the eastern boundary of the right of way to the north of the site eliminates the opportunity for a landscaped bed in this location. However the proposed landscaping within the parking areas will help to soften the visual impact of the proposal in that location.

- The open drainage channel along the northern boundary also limits the opportunity for landscaping. However, there are trees and understorey landscaping which will have a screening effect in this location.
- The steep embankment to the south-east boundary is proposed to be concreted due to the steep gradient at the top of the retaining wall. This eliminates the opportunity for landscaping. However, as Ochre Landscape Architects indicate, the building is cut well into the site in this location and hence softening is not considered to be as critical along this boundary.
- The western portion of the site is proposed to be hydro seeded with pioneering grasses and native vegetation which will provide a strong buffer. A single garden bed has therefore not been provided on the boundary for this reason, and landscaping proposed adjacent to the western carpark will provide the required softening in this portion of the site.

Much consideration has been given to the provision of landscaping provision on the subject site. The battleaxe arrangement from Princes Highway makes this site unusual in that it is not as visually prominent as if it were to have full frontage to the main road. Therefore it is considered that the level of landscaping proposed in this location is appropriate for the site. In relation to the Sylvester Avenue entrance, landscaping has been provided adjacent to the access driveway and between the parking spaces and Sylvester Avenue, which is also considered to be appropriate for the proposal. On all other sides the site is surrounded by industrial allotments. Furthermore, given that the subject site is located in a well-established industrial estate, and that the existing building to the south is constructed relatively close to the property boundary, the level of landscaping is adequate to provide an aesthetically pleasing industrial building in the context of surrounding development.

8.7 Building Height

Illawarra Regional Environmental Plan specifies a maximum 11m height from ground level to ceiling to buildings in this location. Where development exceeds this height, the concurrence of the Department of Planning is required, which we understand would form part of the Minister's determination role.

Furthermore, clause 4.3 (Height of Buildings) of draft Wollongong Local Environmental plan 2009 states that the height of a building on any land is not to exceed the maximum height shown on the land of the Height of Buildings Map. For the subject site, the Height of Buildings Map allows a maximum building height of 11.0m. The proposal exceeds this requirement, with a proposed height of 15.7m. Section 4.7 of this Environmental Assessment provides justification for the proposed height variation to the IREP No., 1 and DWLEP 2009.

8.8 Servicing

Augmentation of existing water and electricity services will be required, subject to endorsement by relevant servicing authorities. The proposal will require a substation of approximately 1000 KVA, which will be located on site at Sylvester Avenue, near the shared boundary with the property to the south.

It is intended that an on site package treatment plant will be provided to treat the domestic sewage/grey water and the process waste water to a tertiary level, suitable for reuse on the site and/or discharge to the site stormwater system. All site wastewater would be directed to the package treatment plant, where

it would be treated and reused on site for irrigation or toilets or discharged to the stormwater system. Liquid waste will be stored and collected as described in section 3.4.7 above.

Waste from the operation will be housed in separate waste containers. The waste is all solid, non-putrescible waste and be disposed of as landfill. The exception is recycling bags, which will be delivered to Flagstaff in Unanderra. In addition to this, there is a metal recycling bin that is removed periodically (approximately once per month). The proposed operation will see an average of 400 tonnes of raw materials and product transported by road vehicles per week, with the preferred vehicle type being 12.5m heavy rigid vehicles. It is estimated that truck movements will be relatively regular, with approximately four truck movements into the site and four truck movements out of the site each working day (Monday to Friday only), predominantly during daylight hours.

Loading and unloading is currently carried out by solid-tyred fork lift vehicles. The average time to load or unload a truck is 30 minutes, and up to one hour to load a container. Special areas have been set aside for loading and unloading. Swept turning paths have been provided in accordance with the Australian Standard for all vehicles accessing the site (see appendix D of the Traffic Impact Statement prepared by KFW).

8.9 Security

Security measures that will be implemented at the site include security fencing around the perimeter of the site with lockable gates at the entry points. The visual impact of the fencing is considered to be minimal given the industrial nature of the locality, and that this site is an internal site for the most part, except at the Sylvester Avenue entrance, which is located adjacent to other industrial uses. The boundaries of the subject site will also be defined by dense screen planting, to improve the visual amenity of fencing. In addition to the above, it should be noted that on site security will be supported by the use of a security contractor.

9 Statement of Commitments

Section 9 contains an outline of the proposed environmental management and monitoring measures which are recommended for Cookson Plibrico's Unanderra plant. Specifically, this section contains a description of the measures that should be considered for implementation to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project. Where appropriate, detailed contingency plans for managing any potential significant risks to the environment are provided.

9.1 Hazard Minimisation

The "Preliminary Hazard Analysis Report" prepared by Whamcorp confirms that the proposed new manufacturing facility and associated operations present no significant risk. In general, the risks are controlled by the application of the relevant Australian Standards. On the basis of this risk control, the proposal should proceed, with the following requirements:

- The design and operation of the proposal should proceed as planned, with the implementation of the safeguards detailed in this report.
- Prior to construction of the building, the final design of the building, including bunded areas and tanker bay(s) should be checked by a suitably qualified person to confirm compliance with the relevant safeguards.
- A HAZOP study of the Hexion Durite resin storage and handling system design should be conducted, prior to construction/installation of that system.
- The dangerous goods storage should be notified to WorkCover NSW and all dangerous goods requirements of the OH&S Act and regulation should be met.
- The detail of this study should be reviewed against the final design and any new requirements documented. Where significant changes have been made, a final hazard analysis should be conducted.

9.2 Emission Reduction Measures

It is recognised that the new Cookson Plibrico plant will not require reporting under the national Greenhouse and Energy Reporting Act (NGER) Act, due to the level of emissions and the energy consumption levels. Irrespective of this, during assessment of the potential direct and indirect greenhouse gas emissions which may be discharged into the environment, Envirodyne have considered measures which may assist in reducing the emission levels. The reduction measures as recommended by Envirodyne include the following;

- The Scope 3 emission inputs from transportation costs for both employee and freight handling while representing approximately 57% of indirect emissions are likely to be conservative, and warrant further investigation to improve overall emission reductions. The values are derived from estimates and should Cookson Plibrico consider involvement in the Carbon Emissions Trading market, better empirical data should improve these values.
- Waste from production processes are calculated at 1,520 tonnes CO₂-e per annum. Efforts to reduce this through recycling of paper and plastics away from landfill should be investigated.

- Efforts to buy 'green power' from suitable electrical supply companies who deliver power into the grid from sustainable sources should be investigated as a means of reducing the indirect Scope 2 emissions rates from the plant.

9.3 Air Quality and Odour Mitigation Measures

The Envirodyne Report recommends that a number of measures be implemented (or continued from operations at Bulli) to minimise potential air quality and odour impacts, detailed as follows:

- Conduct sampling and analysis of exhaust airstreams from the various plant processes to verify dust collection efficacy and the levels of air impurities that may be present. This work should be conducted during commissioning work for the new plant and the results become required operating conditions for plant Standard Operating Procedures.
- Provide adequate ventilation rates to ensure negative pressure in and around the Cookson Plibrico processes so that no fugitive emissions occur during handling, loading and production.
- Ensure that the process airflow is passed through dust collectors on each process line, with collected dust product returned to the process.
- Evaluate all dust collectors prior to relocation to Unanderra, to determine their effective life and operational service, and whether it would be more practical to install new dust collectors in the relocation.
- Ensure all collectors operate to the Group C categorisation of 100 mg/m³ of particulate matter from processes.
- Upgrade manufacturing practices where applicable within the plant to improve materials handling for both Occupational Health and Safety reasons as well as overall air quality.

9.4 Noise Mitigation and Management

Acoustic Studio confirm that *"no additional noise controls are required to control operational noise levels during the typical operating scenario for the facility. The proposed construction of the envelope of the building (precast concrete wall panels plus colourbond roof) will be sufficient to control operational noise levels at all residential receiver location.)"*

However due to the predicted exceedance caused by the Com Cast Vitro table, it is recommended that this machinery not be operated before 7am or after 6pm.

Further, the *"Noise Impact Assessment Acoustic Report"* noted that there are a large number of ventilation fans and dust collectors associated with the proposal, some of which will be reused from the existing facility. Acoustic Studio recommend that , whilst these are relatively low noise items of equipment the noise of each does need to be assessed to ensure that environmental noise limits are met.

This will be particularly relevant for fans and silencers which to be re-used within the new facility. Similarly for new fans or replacement fans the following measures are recommended:

- Select plant to operate at lowest noise output.
- Provide in-duct attenuation, including silencers and absorptive duct linings as required.
- Provide fan enclosures and duct linings as required.

In addition Acoustic Studio recommend that ongoing noise monitoring be undertaken to ensure compliance with the noise limits, and that this commence soon after the completion of the relocation of the facility.

Whilst Acoustic Studio conclude that construction noise impact is not anticipated to be significant for this project, a number of other measures are also recommended to contain potential noise impacts during construction including the following;

Construction noise will be managed by:

- Limiting the operating noise of machinery brought on to the site
- Where appropriate, obtaining acoustic test certificates for machinery brought on to the site.
- Measuring the background noise level at the site boundary and at two specified noise sensitive receivers prior to any construction work taking place.
- Subsequent monitoring of noise by an acoustic consultant at noise sensitive receivers and other selected locations around the site, as required by the project construction activities.
- Implement non-compliance and corrective action procedure when required.
- If there is excessive noise from any process, that process will be stopped and if possible that noise attenuated to acceptable levels. Where there is no alternative the process will be rescheduled to non-sensitive hours. Where this is not possible and Best Practicable Means are being employed the activity will continue and affected stakeholders will be notified.
- Records of all results will be held on site and will be reviewed by the Project Manager weekly.
- Informing interested parties, as far as practicable, of impending or current events that may cause high levels of noise.
- All activities relating to the construction works will be carried out in line with current best practice.

When noisy activities are expected, noise sensitive receivers in the vicinity will be notified of impending activities. Upon receipt of a complaint in relation to noise the project team will:

- Ascertain from the complaint what appliance/activity is causing the problem i.e. inside or outside the site and in what position.
- Establish, by way of monitoring, if the allowable noise level has been exceeded for both plant and general site noise.
- Establish if the appliance positioning has previously been highlighted as a problem area. If not and the noise levels are above the allowable noise level then the equipment and its position will be noted.
- Terminate activity or offending item of plant/machinery if the allowable levels have been exceeded, or take other acoustic remedial action to reduce noise levels to within allowable limits.

- If the activity is occurring outside agreed working hours, the General Foreman will immediately stop the activity. Where stopping the activity would create a safety issue the General Foreman will permit the activity to continue only as long as is necessary to make the area safe; The activity will then be directed to cease.
- Any activity that is directed to cease due to excessive noise may not recommence until the Project Manager is satisfied that the requirements of this plan can be met and has given permission to recommence the activity.
- The Project Manager will ensure that a report of any incident is included in the site records provided to any relevant stakeholders.
- Should it not be possible to adequately attenuate the noise of an activity and it cannot be rescheduled to less sensitive hours, providing Best Practicable Means are being employed the activity will be allowed to continue. The relevant stakeholders and the Council will be notified.

9.5 Water Management Controls

There are no specific mitigation measures proposed by BECA in relation to water management as it is concluded that the proposed system represents good environmentally sensitive design practice.

9.6 Waste Minimisation

The proposed development will incorporate a waste management hierarchy that aims firstly to minimise waste, secondly to re-use waste and as a last option to responsibly dispose of remaining waste.

Material handling has been identified as a major contributor to waste production. Waste will be reduced by changing the layout of the new plant and modifying current handling techniques, especially in regard to minimising spillage. Measures which are recommended to minimise waste from the plant are contained in Table 14 below:

Table 14: Summary of Waste Minimisation Plan

No.	Current System	Major Source of Waste	New System
1	Raw material stored in bags prior to Crusher	Sweepings	Delivery trucks empty material directly into hoppers which then directly feed into Crusher
2	Crusher fills bins with product which is then transferred to Ball Mill via forklifts	Spillage	Looking into options for pneumatically conveying ~80% crusher product to Ball Mill
3	Existing wastewater facility- sedimentation only Cleanaway contracted to remove waste	Liquid Waste	Invest in a tertiary wastewater treatment plant that allows effluent to be discharged into stormwater, thereby major reduction in liquid waste generated
4	Teka – ingredients from Ram, Comcast and Precast are individually weighed out, mixed and placed into bags	Spillage	Batching systems at the reverse end of the Teka i.e. individual raw materials and additives are weighed out and placed in a bin that gets transported to where it needs to be used (e.g. RAM Extruder, Comcast and Precast etc)
5	Precast and Comcast currently situated away from wastewater treatment plant Wash water used to clean skips	Spillage and Liquid Waste	Precast and Comcast to be placed near potential tertiary wastewater treatment plant Wastewater fed into sump pit before treatment

Current practices for reuse and recycle of material will be continued at the new facility, these include:

- All points of material transfer have ventilation systems and/or dust collectors that remove entrained fine particles. The material collected is recycled directly back into the process in most cases. In other cases fines are recycled internally via the "FCRA" bins.
- All plastic bulk bags (up to 9m³ per week) are collected and sent off site, and ultimately to a plastic recycling plant.
- Taphole Clay spillages and sweepings are collected and put directly back into the process.
- Generally, all dry spillage and sweepings are placed into the "FCRA" bins for internal reuse in RAM Extruder premix.

9.7 Traffic Management

The proposed development will manage the traffic utilising the Princes Hwy access handle through the layout of parking spaces, which will ensure that the access handle will only be utilised by heavy vehicles. Seven (7) visitor parking bays have been provided immediately adjacent to the administration centre, thus limiting movement to the Sylvester Avenue entrance. The only vehicles to pass the visitor bays are those of employees, contractors or others that have been subject to OH&S induction procedures. This will impact positively on the management of the access handles use. Limitations on access handle use will be implemented as part of the overall operational policies of Cookson Plibrico, and will ensure that regular vehicles do not utilise the access handle. Furthermore, signage will be posted as appropriate to alert users of the Access handle as to the limitations.

10 Consultation

The requirements that were received from the Director-General included consultation requirements for the Environmental Assessment of the proposal. As such, during the preparation of the Environmental Assessment the relevant local, state or commonwealth government agencies were consulted, including the Department of Environment and Climate Change, the Roads and Traffic Authority and Wollongong City Council. It is also a requirement to consult with relevant community groups or affected property owners. The consultation processes and issues raised are outlined below for each authority:

10.1 Department of Environment and Climate Change

The proposal was discussed with the Department of Environment and Climate Change (DECC) in relation to the proposed on site treatment system and DECC also carried out a site inspection and review of the draft Air Assessment Report. Correspondence from DECC is included in Appendix 5 of this report.

In terms of the on site treatment system, DECC advised that the proposed plant is relatively small in nature and hence will not require an Environmental Protection Licence (nor will the development as a whole). DECC further advised that the final approval of the on site treatment plant will stand under the jurisdiction of Wollongong City Council. A copy of emails and the correspondence from DECC is also included as appendix B of the Water Management Report and the Waste Study Report, both prepared by BECA.

Furthermore, following on from the site inspection and review of the air quality information DECC advised that *'the proposed development does not require an Environmental Protection Licence (EPL) and for this reason the Department (DECC) declares no further interest in being involved in the approval process'*.

10.2 Roads and Traffic Authority

The Roads and Traffic Authority (RTA) provided a letter dated 24 February 2009 that was included as an attachment to the Director-General's requirements (Appendix 3). In its letter the RTA raised concerns with entry to and egress from the site from the Princes Highway access handle, appropriate access to the site for trucks and the capacity for the existing junction at Orangegroove Road and the Princes Highway to accommodate the increased traffic movements.

Following on from this correspondence a meeting was held between Nicole Stevenson (RTA), Shaun Prince (Development Manager) and David Dowey (KFW – Traffic Engineer) on 29 June 2009. The following table details the issues that were discussed, and the manner in which the proposal addresses the RTA's concerns:

Table 15: Issues discussed with the RTA

Issue raised by the RTA		Manner in which it has been addressed
1	Dissatisfaction with current traffic management plans, in particular the use of the Princes Hwy access handle	It is considered that a reasonable compromise has been made by removing the originally proposed parking and general vehicular access from the handle, and through the attempt to control the access handle use as much as possible through the site layout and induction measures that will be implemented during the operational phase of the proposal. The subject site having two points of access (one being the access handle to the left turn only for heavy vehicles) is integral to the Cookson Plibrico operations, and is required from a safety and an operational efficiency point of view.
2	Ideally the access handle should be permanently blocked off at the southern portion (preventing any use of the handle from the Cookson Plibrico factory)	The closure of the access handle is not possible for internal site safety and site operation efficiency. Some use of the handle is integral to the proposed use of the site (in addition to the other two properties who have legal access to the access handle). Cookson Plibrico have undertaken extensive searches in the Illawarra for the relocation of its existing operations at Bulli and identified it as the most appropriate site. Cookson Plibrico have indicated that, if approval is not granted for its operations on this site that it will relocate outside of the Illawarra (thereby reducing employment in the region).
3	If use of the handle continues a median strip will be required.	The turning paths provided by KFW show that heavy vehicles are able to enter the Princes Highway without impacting on through traffic on the inside lane of the Princes Hwy. The modifications required to allow heavy vehicle egress onto the Princes Hwy are detailed in the Traffic Impact Statement prepared by KFW.
4	SIDRA is required for the Orangegroove Ave/Princes Hwy intersection	KFW are currently undertaking a SIDRA analysis at the Orangegroove Ave/Princes Hwy intersection, which will be lodged as soon as practicable under a separate cover.
5	Crash analysis needs to be undertaken	The RTA have committed to conducting a crash analysis.

A further meeting, which was attended by representatives of the RTA and the Department of Planning, was held on 27 October 2009. At this meeting it was agreed that the Princes Highway exit could be used by heavy rigid vehicles with a maximum length of 12.5 metres.

10.3 Wollongong City Council

While not included in the Director-General requirements, Wollongong City Council (WCC) provided a letter dated 15 March 2009 that provides suggestions for issues to be addressed in the Environmental Assessment. The issues raised by Council and the manner in which they have been addressed are summarised in table 16 below:

Table 16: Suggestions raised by WCC

Issue		Concern raised by WCC	Manner in which it has been addressed
1	Wollongong LEP 1990	Permissibility and definition of the proposal within the 4(a) zone	The definition and permissibility of the proposal is detailed in section 4.6 of this Environmental Assessment.
2	Draft Wollongong LEP 2009	Permissibility and definition of the proposal within the IN2 zone	Consideration has been given to the Draft Wollongong Local Environmental Plan 2009, which is outlined in section 4.7.1 of this report.
3	Elevation Treatments	Attention should be given to the colours and materials used to add some visual interest. It is suggested that the proponent look at treatments to reduce the opportunity for vandalism.	The visual impact of this proposal has been considered by Design Workshop in the Visual Impact Assessment that accompanies this report. Design Workshop found that the colours and materials used in the proposal are appropriate in this industrial location and will aid in the integration of the proposal in the existing streetscape. The security fence proposed around the perimeter of the site will make it difficult for vandals to gain access to the proposed building. The proposal is on an internal site, and is not visually prominent, therefore the building is not considered to be a desirable target for vandals. It is also of note that a contract security firm will be employed to undertake site surveillance tasks.
4	Sewer	Details of waste disposal are required.	The proposal includes an on site treatment facility for effluent. The proposed system has been analysed by BECA in the Water Management Report that accompanies this application. Details of sewerage treatment are also included in section 7.5 of this report.
5	Stormwater Management	WCC raised a number of issues in relation to the stormwater management on site	The stormwater issues raised by WCC have been considered in detail in section 8.1 of this report and have been addressed by KFW in the Stormwater Management Plans (Ref: KF109450, dated: 14/07/09) that accompany this application.
6	Traffic Matters	Traffic generation rates should be calculated as a factory specified in the RTA guide. Detailed plans relating to the banned right turn onto the Princes Highway should be submitted. Internal and access dimensions required. Disabled parking spaces required to be shown on plans. The intersection of the access way and the Princes Hwy should accommodate 12.5m HRVs. The current access road should be upgraded to hardstand pavement.	Carparking rates have been discussed in section 8.4 of this report. The Traffic Impact Statement prepared by KFW details the provision of parking, the internal traffic circulation on the site and the traffic management for vehicles entering and leaving the site. The proposal includes 2 disabled parking spaces. The ability for the intersection of the Princes Hwy and heavy vehicles has been addressed by KFW in the Traffic Impact Statement. The access handles is presently partly paved. The handle will be fully paved at construction.

Issue		Concern raised by WCC	Manner in which it has been addressed
7	Servicing	Details of servicing required, including frequency of deliveries and details of the delivery vehicles. Swept path templates should be submitted.	Details of the servicing of the site are discussed in section 8.8 of this report.
8	Waste Collection	Details of waste collection required, including collection points and vehicles. Swept turning paths for an 8.8m medium rigid truck should be submitted.	Waste collection details are outlined in section 8.8 of this report. Waste management is also discussed in section 9.6.
9	Security	Details of the proposed security measures required.	The proposed security measures to be implemented in proposed relocation are outlined in section 8.9 of this Environmental Assessment.
10	Landscaping	Landscape concept plan showing compliance with DCP 6 required.	The manner in which the proposed landscaping meets Council's requirements is discussed in section 4.8 and 8.6 of this report.

10.4 Community Consultation

Prince Property Consulting, the development managers, have confirmed that they will be providing assistance during the statutory public consultation period regarding the proposed development, which will be coordinated by the Department of Planning. It is understood such consultation arrangements have been discussed with the Department of Planning in terms of the Development Manager providing the Department with assistance in this process.

11 Conclusion

The proposed use is defined as 'Light Industry' as outlined in the preceding analysis, and is permissible with consent in the 4(a) zone. The proposal meets the relevant national, state and local statutory requirements that apply to the subject site and the proposed use. The proposal is consistent with surrounding development and will have very limited impacts on residential developments further a field.

Please note, the issue of permissibility is subject to further clarification as per previous discussions with the Department of Planning and the subsequent submission provided to the Director-General.

A number of environmental consultant reports accompany this Environmental Assessment that make recommendations to mitigate any potential amenity or environmental issues. The current operation at Bulli has received some noise complaints in the past from the encroaching residential developments. These noise concerns have been mitigated in the proposed relocation through the internalisation of all of the processes that will occur on site, through the use of appropriate acoustic materials of construction and the distance between the subject site and residential developments. Furthermore, through limiting the hours of operation of the Com Cast Vibro table the noise impacts of the proposal have been assessed as being negligible.

In terms of air quality the assessment undertaken by Envirodyne confirms that the plant at Bulli has not been the cause of air emissions nuisances to the surrounding community and hence it is anticipated that the manufacturing practices to be translated to Unanderra will not require major changes to ensure compliance with the relevant statutory guidelines.

The proposal includes appropriate waste and soil management measures and the facility will be constructed and operated with no adverse environmental impacts.

With regard to the visual impact of the proposed building, the building has been designed to merge with the existing industrial character adjacent to the subject site and the colours and materials used assist in this. Furthermore, the topography of the site and surrounds assist to encompass the building, in effect reducing the building's prominence.

The Greenhouse Gas Assessment found that the new plant at Unanderra will be well within the reporting threshold of the National Greenhouse and Energy Reporting Act, and therefore annual reporting on the Greenhouse Gas emissions is not required. The assessment does not indicate any adverse impacts resulting from the proposal.

The Hazards and Risks Analysis also did not indicate any adverse impacts from the proposed development, and concludes that subject to compliance with the relevant Australian standards the proposal is acceptable.

There is currently some flooding evident in the downstream properties from the subject site. Subconsultant investigations indicate that the proposal will not increase the risk to these properties because an extensive stormwater management system will be implemented that will cater for the 1% AEP and PMF storm flows. Flows will be directed to an open channel within the boundaries of the site and the 1 in 100 year storm event flows will be contained within this channel. The stormwater will be treated on site before exiting the site.

In addition to the above measures, landscaping has been proposed in compliance with Council's requirements.

The proposal is appropriate in this location and will not have any unreasonable impacts given the proximity to residential properties, the industrial character in the surrounding estate and the implementation of mitigation measures, where required, to minimise any adverse impacts on the environment and adjacent and surrounding property owners.

Appendix 1
Development Plans prepared by PRD Architects dated May/July 08

Appendix 2
Record of the Minster's Opinion dated 25 September 2008

Appendix 3

The Director General's Requirements dated 9 March 2009

Appendix 4

Correspondence from Wollongong City Council dated 15 March 2009

Appendix 5

Correspondence from the Department of Environment and Conservation
dated 24 April 2009

Appendix 6

Stormwater Concept Plans prepared by KFW dated 14/07/09

Appendix 7

**Legal advice from Rosier Partners in relation to the Easement for Batter
(dated 19 June 2009)**

Appendix 8
Assessment of Air Quality and Odour
Prepared by Envirodyne (ref: v4, dated: 9 June 2009)

Appendix 9
Water Management Report
Prepared by BECA Pty Ltd (dated: 22 May 2009)

Appendix 10**Acoustic Report****Prepared by Acoustic Studio (ref: MP 09_0045, dated: 27 May 2009)**

Appendix 11
Traffic Impact Assessment
Prepared by KFW (July 2009 and Supplementary Information)

Appendix 12
Waste Study Report
Prepared by BECA Pty Ltd (dated: 19 May 2009)

Appendix 13**Visual Impact Assessment****Prepared by Design Workshop Australia (Project No. 190, dated: 16 June 2009)**

Appendix 14
Greenhouse Gas Emissions Report
Prepared by Envirodyne (ref: v2, dated: 1 May 2009)

Appendix 15
Hazards and Risks Analysis Report
Prepared by Whamcorp Pty Ltd (dated: 7 May 2009)

Appendix 16**Landscape Concept Plans**

Prepared by Ochre Landscape Architects (ref: 1134-LD014, dated: May 2009)