PROPOSED CSR HEBEL PLANT EXTENSION

OUTSTANDING INFORMATION REPORT

Prepared for CSR Building Products Limited - November 2016

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1 INTRODUCTION

1.1 Background

In May 2016 Catalyst Project Consulting (Catalyst) lodged a Development Application (DA) and supporting documents on behalf of CSR Building Products Limited (CSR) for the proposed Hebel Plant Extension Project in Somersby, NSW.

Central Coast Council (Council) have been liaising with CSR since July 2016 about additional information that they require, to fully assess the DA.

Catalyst provided a response dated 10 August 2016, to various queries and requests from Council for additional information (refer to Council's emails dated 4 and 7 July 2016).

A meeting was subsequently held at Council's offices on 6 September 2016 and a visit of CSR's Hebel site was conducted on 12 September 2016. Council provided CSR with Meeting Minutes and a Covering Letter dated 13 September 2016. In this correspondence Council advised that insufficient information has been provided in order for them to be satisfied that the proposal is not designated development by ensuring that there is not an increase in the environmental impacts of the total development.

In their Covering Letter dated 13 September 2016 Council requested the following:

- Specialist reports regarding the current environmental impacts of the current site and also the projected impact the proposal may have on the environment;
- Highlight how the new technology and processes may result in environmental improvements;
- Address Clause 36 of the EP&A regulations with the required technical information as discussed in both meetings with Council; and
- Information regarding the management of the conservation area in the form of an updated Conservation Areas Management Plan (CAMP).

In the minutes of the meeting held at Council's offices on 6 September 2016 Council requested the following:

- Confirmation of no additional environmental impact and request additional information which describes the impacts of the development including:
  - Hours of operation;
  - Noise;
  - Dust/air quality;
  - Traffic;
  - Water quality;
  - Energy Efficiency;
  - Heat;
  - Waste; and
  - Built form impacts.
- Demonstrate environmental impacts of the existing and total development. Develop a comparison table that presents "Approved/Current Operations", "Proposed Expansion" and "Cumulative Impact of Total Operation";
- Consider requirements of SEPP 33;
- Conservation Area - Consider impacts on *Prostanthera junonis* (Somersby mintbush) and describe management actions to date in accordance with the CAMP;
- Supporting evidence from specialists addressing air quality, water quality and noise, addressing environmental impacts of the existing and total development as well as compliance with the relevant legislation / policy guidelines;

- A draft report to be prepared by CSR Hebel and discussed with Council; and
- A final report to be submitted to Council.

On 11 October 2016, CSR met with Council to discuss the proposed approach to addressing the additional information requirements outlined in Council's Meeting Minutes of 6 September 2016. In this meeting it was agreed that CSR would prepare an 'Outstanding Information' report (this report) which contained:

1. A description of the existing and proposed Hebel production process in the form of flow diagrams;
2. A comparison table that presents "Approved/Current Operations", "Proposed Expansion" and "Cumulative Impact of Total Operation, for each of the key matters identified by Council on page 1 of their Meeting Minutes;
3. A noise impact assessment in accordance with the *NSW Industrial Noise Policy* (EPA, 1999;
4. An air quality impact assessment in accordance with the NSW EPA *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2005);
5. An updated Conservation Area Management Plan (CAMP) for the conservation zone on the property. This was committed to in point 4 of Catalyst's response to Council's queries dated 10 August 2016. A description will also be provided on management actions undertaken to date in accordance with the CAMP.

At the meeting with Council on 11 October, CSR advised that they were of the opinion that:

- Catalyst's response to Council's queries, dated 10 August 2016, provided a detailed and adequate SEPP 33 assessment; and
- the Civil Engineering Report included as Appendix E of the Statement of Environmental Effects (SEE), thoroughly and adequately considered stormwater retention, detention and reuse as well as water quality management in accordance with Gosford City Council's (GCC) Development Control Plan (DCP) Section 6.7 Water Cycle Management.

CSR therefore proposed that no additional SEPP 33 or water quality assessments are necessary.

2 ADDITIONAL INFORMATION

2.1 Hebel Production Process

To provide Council with a better understanding of the Hebel production process, CSR have prepared process flow diagrams for both the existing Hebel production process and the proposed modern technology Hebel production process (refer to flow diagrams in **Appendix A**).

2.2 Noise Assessment

Wilkinson Murray was appointed by CSR to undertake an assessment of the potential noise impacts associated with the proposed extension to the existing manufacturing plant. The noise impact assessment (**Appendix B**) has been prepared in general accordance with relevant NSW State government policies and guidelines.

2.2.1 Noise Sensitive Receivers

The closest and potentially most exposed noise sensitive receivers are described in **Table 1** (also see Figure 3-1 of the noise assessment).

All identified receivers consist of free standing one-storey houses except for R11 which represents the Kariong Correctional Centre. For that particular receiver, the assessment location was conservatively selected to represent the most exposed location within the correctional centre.

Most of the houses are located on the eastern side of the M1 Motorway. However, the closest residential receivers, R1 and R2, are located on the western side of the M1 Motorway, within the Somersby Industrial Park (SIP) approximately 700m north of the site along Wisemans Ferry Road.

Due to the close proximity of the M1 Motorway, all identified receivers are affected by constant traffic noise dominating the acoustic environment.

Table 1: Closest and most exposed noise sensitive receivers

Receiver ID	Receiver Address
R1	191 Wisemans Ferry Road, Somersby
R2	180 Wisemans Ferry Road, Somersby
R3	252 Debenham Road, South Somersby
R4	242 Debenham Road, South Somersby
R5	10 Acacia Road, Somersby
R6	223 Debenham Road, South Somersby
R7	214 Debenham Road, South Somersby
R8	12 Acacia Road, Somersby
R9	16 Acacia Road, Somersby
R10	32 Acacia Road, Somersby
R11	Kariong Correctional Centre

2.2.2 Noise monitoring

Background noise monitoring

In order to evaluate existing background noise levels experienced by surrounding receivers, a noise logger was established at R6 between Thursday, 20 and Thursday, 27 October 2016.

Based on site observations, background noise levels in the area are controlled mainly by distant traffic noise emanating from the M1 Motorway, with noise associated with the local fauna also affecting background noise levels. It is possible that distant vehicle movements on the local road network may at times affect the background noise levels at some of the receiver locations.

The distance separating R6 and the motorway is comparable to that separating the other identified receivers from the M1, and for this reason the background noise levels measured at R6 are considered to be representative of those at the other receivers. For some of the identified receivers located closer to the motorway, and therefore exposed to higher background noise levels, the measured levels at R6 may be conservative.

These noise measurements were undertaken in general accordance with Australian Standard AS1055:1997 Acoustics - Description and Measurement of Environmental Noise and the *NSW Industrial Noise Policy* (INP).

Meteorological data was obtained from the Bureau of Meteorology weather station located at Gosford to ensure periods of strong winds and rain were excluded when determining background noise levels.

The monitored noise levels are shown in graphical format in Appendix A of the noise assessment.

Table 2 summarises the background noise levels, expressed as Rating Background Levels (RBLs) for the daytime (7.00am-6.00pm), evening (6.00pm-10.00pm), and night time (10.00pm-7.00am) assessment periods. The RBL represents the background noise in the area, and is determined from measurement of L_{A90} noise levels. Importantly, noise from the source(s) subject to assessment must be absent to determine the RBL. The full methodology for calculating RBL values from measured L_{A90} levels is set out in the INP.

Table 2: Measured RBLs

Monitoring Location	Measured RBL (dBA)		
	Day (7am–6pm)	**Evening (6pm–10pm)**	**Night Time (10pm–7am)**
R6	40	38	38

For the purpose of the assessment, the above RBLs are considered to be representative of all identified receivers.

Existing industrial noise monitoring

Attended noise monitoring was conducted with the intent to establish existing industrial noise (other than that generated by the site) in the vicinity of the site. This is relevant for the amenity noise assessment discussed in Section 2.2.3.

In accordance with the INP, transportation noise does not qualify as industrial noise. As such, noise monitoring was conducted at night to minimise noise generated by traffic on the M1 Motorway and the local road network.

Based on late night spot measurements conducted between 11.00pm and 12 Midnight on Wednesday, 19 October 2016, industrial noise at the identified receivers to the east of the motorway has been estimated at approximately 33dBA, and was found to be primarily controlled by noise emanating from the West Gosford light industrial area. Spot measurements were also carried out at various locations within the SIP and based on those, industrial noise at R1 and R2, which was found to be controlled by noise generated by the SIP, was also estimated at approximately 33dBA. Care was taken to ensure that the estimated industrial noise level associated with the SIP was not affected by noise generated by the existing CSR manufacturing plant.

Based on daytime spot measurements conducted on Thursday, 29 September 2016 industrial noise was determined to be less than 40dBA during the day.

2.2.3 Noise criteria

The INP provides the framework for deriving noise limits for consents and licences that enables the EPA to regulate premises that are scheduled under the *Protection of the Environment Operations Act 1997* (POEO Act). This policy seeks to promote environmental well-being through preventing and minimising noise.

The INP provides a method for assessing noise impact from industrial noise sources at residences and commercial receivers.

There are two noise criteria which should be satisfied under the INP. The first is the “intrusiveness” criterion which assesses the likelihood of noise being intrusive above the ambient noise level. The intrusiveness criterion applies for residential receivers only.

The second noise criterion, known as the “amenity” criterion, ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

The INP stipulates that intrusiveness and amenity criteria are determined for the daytime, evening and night time periods, as relevant. The determined criteria apply at the most affected point on or within the receiver property boundary.

Both intrusiveness and amenity criteria rely on determination of existing noise levels at the receiver location.

INP Intrusiveness Criteria

The intrusiveness criterion requires that the L_{Aeq} noise level from the source being assessed, when measured over 15 minutes, should not exceed the RBL by more than 5dB.

Based on the assumed RBLs set out in **Table 2**, **Table 3** summarises the intrusiveness noise criteria which apply to the identified receivers.

Table 3: Project-specific intrusiveness criteria

Receiver ID	$L_{Aeq,15min}$ Intrusiveness Criterion (dBA)		
	Day (7am–6pm)	Evening (6pm–10pm)	Night Time (10pm–7am)
R1 - R11	45	43	43

INP Amenity Criteria

The amenity criteria, set limits on the total noise level from all industrial noise sources affecting a receiver. Different amenity criteria apply for different types of receiver (e.g. residential, commercial, industrial, or for areas specifically reserved for passive recreation) and different areas (e.g. urban, suburban, rural). The INP classifies all identified residential receivers surrounding the subject site as "rural".

Table 4 summarises the amenity noise criteria which apply to rural residential receivers.

Table 4: Amenity Criteria for Rural Residential Receivers

Receiver ID	$L_{Aeq,Period}$ Amenity Criterion (dBA)		
	Day (7am–6pm)	Evening (6pm–10pm)	Night Time (10pm–7am)
R1 - R11	50	45	40

The noise level to be compared with the amenity criterion is the L_{Aeq} noise level, measured over the relevant day, evening or night time period, due to all industrial noise sources, but excluding non-industrial sources such as off-site transportation, i.e. on public roads.

Where a new noise source is proposed in an area with negligible existing industrial noise, the amenity criterion for that source may be taken as being equal to the overall amenity criterion. However, where noise levels from existing industrial sources are already close to or above the acceptable amenity criterion, the INP requires that the acceptable amenity criterion for any further proposed industrial noise source is commensurately lowered, in the interest of preserving noise amenity. This provision is aimed at preventing against cumulative noise increases over time due to industrialisation.

As described in Section 2.2.2, noise measurements were conducted in order to establish existing industrial noise in the vicinity of the site (excluding noise generated by the existing CSR manufacturing plant). Existing industrial noise was determined to be approximately 33dBA at night at all identified receivers. The same industrial noise level is assumed during the evening period. Daytime industrial noise levels are hard to estimate due to motorway noise dominating the local acoustic environment but were determined to be less than 40dBA at any of the receivers.

As such, considering the existing industrial noise already present in the area, the project-specific amenity criteria are the same as the amenity criteria for rural residential receivers in **Table 4**.

Sleep Disturbance Criteria

To help protect residents from sleep disturbance, the EPA recommends as a screening criterion that 1-minute L_{A1} noise levels (effectively, the L_{Amax} maximum noise level) should not exceed the background noise level (assessed by the RBL) by more than 15dBA when measured or predicted at the location of a building façade. The "sleep disturbance" criterion is only applicable to night time (10.00pm to 7.00am) operations.

On the basis that the night time RBL in the area was measured at 38dBA, the sleep disturbance criterion when assessed external to the residence is 53dBA $L_{A1,1min}$.

2.2.4 Noise impact assessment

Operational noise emissions from the site have been modelled using the "Cadna A" acoustic noise prediction software. A detailed description of the noise modelling methodology, assumptions, worst case operational scenarios and noise sources is included in Section 6.1 of the noise assessment.

Intrusiveness noise assessment

Worst case $L_{Aeq,15min}$ noise levels have been predicted under calm and adverse meteorological conditions at the identified receivers, for both existing and extended operations, for all three assessment periods (day, evening and night).

As outlined in Tables 6-12 to 6-14 of the noise assessment, noise predictions associated with both the existing and extended operations are found to comply with the project-specific intrusiveness noise criteria during the day, evening and night.

$L_{Aeq,15min}$ noise levels are found to increase by 2-5dB under "calm" weather conditions with the extended operation. Under "adverse" weather conditions, noise levels increase by 2-6dB. It is important to note that noise generated by the existing operation are generally expected to be inaudible at all identified receivers and this is not anticipated to change with the extended operation. Only during peak site activity, which is expected to be relatively short in duration, and under adverse weather conditions, will site noise associated with the extended operation be audible at R1 and R2 although such levels are not expected to be intrusive. Noise generated by the extended operation during peak site activity would only be barely audible if at all audible at R3-R11 under the same conditions.

Amenity noise assessment

$L_{Aeq,period}$ noise levels have been predicted under calm and adverse meteorological conditions at the identified receivers, for both existing and extended operations, for all three assessment periods (day, evening and night).

As outlined in Tables 6-15 to 6-17 of the noise assessment, noise predictions associated with both the existing and extended operations are found to comply with the project-specific amenity noise criteria during the day, evening and night.

$L_{Aeq,period}$ noise levels are found to increase by 2-4dB with the extended operation. However, such increase is not expected to be noticeable at any of the identified receivers due to the relatively high traffic noise levels in the area.

Sleep arousal noise assessment

$L_{A1,1min}$ noise levels have been predicted under calm and adverse meteorological conditions at the identified receivers, for both existing and extended operations.

As outlined in Table 6-18 of the noise assessment, noise levels are found to comply with the project-specific sleep arousal noise criteria at all identified receivers.

Consideration of traffic noise impacts

Truck movements associated with the site will continue to use the M1 Motorway and as such will only travel along the motorway on- and off-ramps and the Wisemans Ferry Road section between the motorway and the site. Since the site will only be accessed through left-in/left-out intersections, trucks arriving at site will need to travel all the way to the Wisemans Ferry Road/Somersby Falls Road roundabout to U-turn.

No residential receivers are located along the motorway on- and off-ramps and the Wisemans Ferry Road section from the motorway to the Wisemans Ferry Road/Somersby Falls Road roundabout. For this reason, truck movements associated with the site on those sections of public road are not expected to have any noise impact on residential receivers. Furthermore, truck movements generated by the site will result in a negligible increase in noise levels along the M1 Motorway due to the high traffic volumes using the motorway.

Similarly, noise generated by light vehicles from staff is expected to be negligible on the local road network.

Therefore, traffic noise on public roads associated with the site is not expected to impact on the surrounding community and road traffic noise is not further discussed as part of this assessment.

2.2.5 Conclusion of noise impact assessment

The noise assessment undertaken by Wilkinson Murray has assessed the potential worst-case noise impacts associated with the proposed extension to the existing Hebel manufacturing plant at Somersby, NSW.

The assessment has been undertaken in accordance with the relevant NSW State government policies and guidelines.

The noise assessment concluded that.

- $L_{Aeq,15min}$ noise predictions associated with both the existing and extended operations are found to comply with the project-specific intrusiveness noise criteria at all identified receivers for all three assessment periods;
- $L_{Aeq,period}$ noise predictions associated with both the existing and extended operations are found to comply with the project-specific amenity noise criteria at all identified receivers for all three assessment periods;
- $L_{A1,1min}$ noise levels are found to comply with the project-specific sleep arousal noise criteria at all identified receivers;
- Traffic noise on public roads associated with the site is not expected to impact on the surrounding community; and
- Noise from the proposed extension is only likely to be slightly audible under adverse meteorological conditions and during peak site activity, which is expected to be relatively short in duration. Therefore, although a slight increase in noise levels is expected with the proposed extension, this is unlikely to result in significant noise impact at the identified receivers.

2.3 Air Quality Assessment

Todoroski Air Sciences was appointed by CSR to undertake an assessment of the potential air quality impacts associated with the proposed extension to the existing manufacturing plant. The air quality impact assessment (**Appendix C**) has been prepared in general accordance with the NSW Environment Protection Authority (EPA) document *Approved*

Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC, 2005) (referred to as the Approved Methods).

2.3.1 Air quality criteria

Particulate matter (dust)

Particulate matter consists of dust particles of varying size and composition. Air quality goals refer to measures of the total mass of all particles suspended in air defined as the Total Suspended Particulate matter (TSP). The upper size range for TSP is nominally taken to be 30 micrometres (µm) as in practice particles larger than 30 to 50µm will settle out of the atmosphere too quickly to be regarded as air pollutants.

Two sub-classes of TSP are also included in the air quality goals, namely PM_{10}, particulate matter with equivalent aerodynamic diameters of 10µm or less, and $PM_{2.5}$, particulate matter with equivalent aerodynamic diameters of 2.5µm or less.

Particulate matter, typically in the upper size range, that settles from the atmosphere and deposits on surfaces is characterised as deposited dust. The deposition of dust on surfaces may be considered a nuisance and can adversely affect the amenity of an area by soiling property in the vicinity.

Particulate matter (dust)

Table 5 summarises the air quality goals that are relevant to this air quality assessment as outlined in the Approved Methods.

The air quality goals for total impact relate to the total dust burden in the air and not just the dust from the proposed extension. Consideration of background dust levels needs to be made when using these goals to assess potential impacts.

Table 5: NSW EPA air quality impact assessment criteria

Pollutant	Averaging Period	Impact	Criterion
TSP	Annual	Total	90µg/m^3
PM10	Annual	Total	30µg/m^3
	24 hour	Total	50µg/m^3
Deposited dust	Annual	Incremental	2g/m^2/month
		Total	4g/m^2/month

Source: NSW DEC, 2005
µg/m^3 = micrograms per cubic metre
g/m^2/month = grams per square metre per month

National Environment Protection (Ambient Air Quality) Measure

The *National Environment Protection Council (NEPC) Act 1994* and subsequent amendments define the National Environment Protection Measures (NEPMs) as instruments for setting environmental objectives in Australia.

It is important to note that NEPM air quality standards are not designed to be applied to specific projects. The NEPM standards apply to the average exposure to air pollutants of the general population, in each State. The NEPM requires that the States report to the Commonwealth on the trends in air quality by way of reference to the standards.

The National Environment Protection Council agreed to vary the Ambient Air Quality National Environment Protection Measure by approving an amending instrument on 15 December 2015. The amending instrument took effect on 4 February 2016.

The Ambient Air Quality NEPM specifies national ambient air quality standards for air pollutants including PM_{10} and $PM_{2.5}$. The standard for PM_{10} and $PM_{2.5}$ is outlined in **Table 6**.

Table 6: NEPM standards for PM_{10} and $PM_{2.5}$ concentrations

Pollutant	Averaging Period	Maximum concentration
PM10	24 hour	50µg/m^3
	Annual	25µg/m^3
PM2.5	24 hour	25µg/m^3
	Annual	8µg/m^3

Source: NEPC, 2016

As with each of the NEPM standards, these apply to the average, or general exposure of a population, rather than to "hot spot" locations near industry, where impacts are assessed via impact assessment criteria.

The NSW EPA do not have impact assessment criteria for $PM_{2.5}$ concentrations.

Nitrogen dioxide

Nitrogen dioxide (NO_2) is reddish-brown in colour (at high concentrations) with a characteristic odour and can irritate the lungs and lower resistance to respiratory infections such as influenza. NO_2 belongs to a family of reactive gases called oxides of nitrogen (NO_X).

These gases form when fuel is burned at high temperatures, mainly from motor vehicles, power generators and industrial boilers (US EPA, 2011). It is important to note that when formed, NO_2 is generally a small fraction of the total NO_X generated.

Table 7 summarises the NSW EPA air quality goals for NO_2.

Table 7: NSW EPA air quality impact assessment criteria of air toxics

Pollutant	Averaging period	Criterion
Nitrogen dioxide (NO2)	1 hour	246µg/m^3
	Annual	62µg/m^3

Source: NSW DEC, 2005

2.3.2 Dispersion modelling results

Dispersion modelling approach

Air dispersion modelling was undertaken using the CALPUFF model. CALPUFF is an advanced "puff" air dispersion model which can deal with the effects of complex local terrain on the dispersion meteorology over the entire modelling domain in a three-dimensional, hourly varying time step. The model setup used is in general accordance with methods provided in the NSW EPA document *Generic Guidance and Optimum Model Setting for the*

CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia' (TRC, 2011).

A detailed description of the dispersion modelling approach, methodology and emission estimation, is included in Section 6 of the air quality impact assessment.

Dust concentrations

Table 8 presents the predicted particulate dispersion modelling results at each of the assessed sensitive receiver locations. The same sensitive receivers considered in the noise assessment have been used for dispersion modelling purposes in the air quality assessment. The results show minimal incremental effects would arise at the sensitive receiver locations due to the proposed extension.

Section 7.1 of the air quality impact assessment presents pollutant concentration isopleths showing the spatial distribution of the predicted incremental impacts associated with the operation of the proposed extension (alone) over the modelling domain for maximum 24-hour average $PM_{2.5}$ and PM_{10}, annual average $PM_{2.5}$, PM_{10}, TSP and deposited dust levels.

Table 8: Particulate dispersion modelling results for sensitive receivers - Incremental impact

Receiver ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/month)
	Incremental impact					
	24-hour average	Annual average	24-hour average	Annual average	Annual average	Annual average
	-	-	-	-	-	2
R1	0.4	<0.1	3.1	0.3	0.5	<0.1
R2	0.4	<0.1	3.3	0.2	0.5	<0.1
R3	0.6	<0.1	4.6	0.3	0.8	<0.1
R4	0.6	<0.1	4.7	0.3	0.8	<0.1
R5	0.4	<0.1	3.3	0.2	0.5	<0.1
R6	0.5	<0.1	3.9	0.3	0.7	<0.1
R7	0.5	<0.1	3.7	0.3	0.7	<0.1
R8	0.3	<0.1	2.5	0.3	0.6	<0.1
R9	0.3	<0.1	2.2	0.3	0.6	<0.1
R10	0.3	<0.1	2.1	0.3	0.6	<0.1
R11	0.5	<0.1	3.7	0.3	0.6	<0.1

The predicted cumulative[1] $PM_{2.5}$, PM_{10}, TSP and dust deposition levels due to the proposed extension with the estimated background levels are presented in **Table 9**. The results indicate the predicted levels would be below the relevant criteria at the assessed sensitive receptor locations.

Section 7.1 of the air quality impact assessment presents pollutant concentration isopleths showing the spatial distribution of predicted cumulative impacts (total) over the modelling domain for annual average $PM_{2.5}$, PM_{10}, TSP and deposited dust levels.

Table 9: Particulate dispersion modelling results for sensitive receivers - Cumulative impact

Receiver ID	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/month)
	Cumulative impact			
	Annual average			
	8*	30	90	4
R1	5.8	15.8	47.0	2.6
R2	5.8	15.7	47.0	2.6
R3	5.8	15.8	47.3	2.6
R4	5.8	15.8	47.3	2.6
R5	5.8	15.7	47.0	2.6
R6	5.8	15.8	47.2	2.6
R7	5.8	15.8	47.2	2.6
R8	5.8	15.8	47.1	2.6
R9	5.8	15.8	47.1	2.6
R10	5.8	15.8	47.1	2.6
R11	5.8	15.8	47.1	2.6

*NEPM Standard

Assessment of Total (Cumulative) 24-hour average $PM_{2.5}$ and PM_{10} Concentrations

An assessment of total (cumulative) 24-hour average $PM_{2.5}$ and PM_{10} impacts was undertaken in general accordance with the Approved Methods, as outlined in detail in Section 7.2 of the air quality impact assessment.

[1] The cumulative impact is defined as the modelling impact associated with the operation of the extended operations combined with the estimated ambient background levels outlined in Section 4.3.4 of the air quality impact assessment in Appendix C.

The Level 2 contemporaneous assessment of cumulative 24-hour average PM_{10} impacts requires further and more detailed analysis of background conditions and the predicted incremental impacts due to the proposed extension. The Level 2 assessment involves adding the predicted incremental impact of the proposed extension to each day's measured background levels. This method accounts for the highly varying background dust level on any given day, and also the effects of the weather conditions on each day in regard to a developments emissions.

The NSW EPA contemporaneous impact assessment approach was applied at the most impacted receiver location, R4. Detailed tables of the full assessment results are provided in Appendix B of the air quality impact assessment. The results of the contemporaneous impact assessment indicate that it is unlikely that cumulative impacts would arise at the most impacted location and therefore it is inferred that the maximum impact at the other sensitive receivers of the proposed extension would not exceed the criteria.

NO_2 concentrations

Table 10 presents the predicted NO_2 dispersion modelling results at each of the assessed sensitive receiver locations. It can be seen that the predicted incremental impacts from the proposed extension are low and are well below the relevant air quality criteria of 246µg/m^3 for 1-hour average NO_2 and 62 for annual average NO_2.

With the addition of the maximum 1-hour and annual average background NO_2 levels measured at the Wyong monitor (refer to Section 4.3.4 of the air quality impact assessment), the total predicted impact at the sensitive receivers would remain well below the applicable criteria.

The predicted spatial distribution patterns of the incremental maximum 1-hour average and annual average NO_2 concentrations are represented in the isopleths shown in Section 7.3 of the air quality impact assessment.

Table 10: NO_2 dispersion modelling results for sensitive receivers - Incremental impact

Receiver ID	NO_2 (µg/m^3)	
	1-hour average	Annual average
R1	4.3	<0.1
R2	2.5	0.1
R3	3.2	0.1
R4	2.7	0.1
R5	2.0	0.1
R6	2.4	0.1
R7	2.4	0.1
R8	2.5	0.1
R9	2.4	0.1
R10	2.5	0.1
R11	4.1	<0.1

2.3.3 Dust mitigation and management

To ensure activities associated with the proposed extension have a minimal effect on the surrounding environment and sensitive receivers, it is recommended that appropriate operational and physical mitigation measures as listed in **Table 11** be considered and implemented where it is feasible and reasonable to do so.

Table 11: Potential dust mitigation options

Source	Mitigation Measure
General	Engines to be switched off when not in use for any prolonged period
	Vehicles and plant engines to be fitted with pollution reduction devices (e.g. particle filters) where practicable
	Maintain and service plant and vehicles according to manufacturer's specifications
Existing Stockpile*	Minimise amount of stockpiled material
	Keep stockpiled material moist
	Stockpile material in a three-sided enclosure
Material handling	Reduce drop heights from loading and handling equipment
	Apply water if material is excessively dusty
Onsite transport/ hauling activities	Sealed haul roads to be cleaned regularly
	Restrict general vehicle speed
	Cover vehicle loads where possible
	Prevent material being spilled on trafficked area
	Trafficable areas clearly marked; vehicle movement restricted to these areas

*The proposed extension does not involve any new stockpiling of material

2.3.4 Conclusion of air quality impact assessment

The air quality assessment undertaken by Todoroski Air Sciences has assessed the potential worst-case air quality impacts associated with the proposed extension to the existing Hebel manufacturing plant at Somersby, NSW.

Air dispersion modelling using the CALPUFF model was used to predict the potential for off-site air quality impacts in the surrounding area due to the operation of the proposed extension. The estimated air emissions applied in the modelling include the existing activities and the new proposed activities. Due to the assumptions applied, the estimated emissions are likely to be conservative and the results of the modelling would overestimate the actual impacts.

It is predicted that all assessed air pollutants attributable to the proposed extension would be within the applicable assessment criteria at all sensitive receivers at all times, and therefore would not lead to any unacceptable level of environmental harm or impact in the surrounding area.

Nevertheless, the site would apply appropriate air quality management measures to ensure it minimises the potential occurrence of excessive air emissions from the site.

Overall, the assessment demonstrates that the proposed extension can operate without causing any significant air quality impact at sensitive receiver locations in the surrounding environment at any time.

2.4 Revised Surface Water Management Plan

Although the Civil Engineering Report included as Appendix E of the SEE, thoroughly and adequately considered stormwater retention, detention and reuse as well as water quality management in accordance with GCC's DCP, during the process of addressing Council's request for additional information on the proposed development, Acor Consultants on behalf of CSR, took the opportunity to make some minor refinements to the Civil Engineering Report, which included:

- Ensuring that all stormwater from the site flows to the proposed stormwater detention/reuse tank: Stormwater from the west of the existing site, near the existing site entrance, is directed to the piped stormwater system for the new development, which will convey flows to the east to the proposed stormwater detention/reuse tank, via a Gross Pollutant Trap (GPT), which reduces the volume of pollutants entering the detention/reuse tank. Existing stormwater pipes that currently discharge offsite in the north eastern part of the site, will be rerouted to discharge into the proposed stormwater detention/reuse tank;
- A significant increase in stormwater reuse volumes: CSR previously proposed to reuse up to 1.44 kL/day of stormwater retention for flushing toilets in the new plant. This equates to an average annual reduction in potable water usage of 0.5 ML. CSR have since undertaken further investigations into other avenues for water reuse in the new plant and are satisfied that stormwater from the proposed retention tank can be reused in the ball mill and/or slurry wash at the new plant. It is estimated that up to 75 kL/day of stormwater will be reused in the manufacturing process. Modelling of the reuse with 800 m^3 of storage indicates that, on average, the reuse demand of 75 kL/day will be met 71% of the time throughout the year. This equates to an average annual reduction in potable water usage of 19.0 ML; and
- A significant reduction in stormwater pollutants from the total site: Although the previous Civil Engineering Report demonstrated that the proposed new development area could achieve the GCC Pollution Reduction requirements, the total site pollution reduction (i.e. stormwater runoff from the existing and proposed sites) did not meet the GCC Pollution Reduction requirements for Total Suspended Solids (TSS) or Total Nitrogen (TN). By increasing the stormwater reuse volumes, a substantial reduction was achieved in the total site pollutants resulting in a further 18% reduction in TSS, a further 15% reduction in Total Phosphorous (TP) and a further 16% reduction in TN. The revised stormwater quality modelling estimated that the following pollution reduction could be achieved for the total site; 81% for TSS, 62% for TP and 49% for TN, which exceeds the GCC pollution reduction requirements.

The revised Civil Engineering Report has been included in **Appendix D**.

CSR will update their existing preventative maintenance system to include appropriate measures for the ongoing management and maintenance of the stormwater management system, once constructed.

2.5 Revised Conservation Area Management Plan

As outlined in Section 5.4 of the SEE, in 2009, Whelan Insites prepared a Conservation Areas Management Plan (CAMP) for part of the subject site that is now identified as a conservation zone. The land which the CAMP includes is:

- A Somersby Mintbush Conservation Area (SMCA) in the south-west corner of Lot 22 (the subject site);
- A band 20 metres wide along the southern boundary of Lot 22 linking the site to Piles Creek watercourse (which is now zoned RE1 Public Recreation);
- The entire eastern part of Lot 22 (to the east of Piles Creek).

The CAMP has since been updated by Kleinfelder to include:

- Updated management actions including target weed species and timing for weed control works;
- An updated section regarding fencing of the site, both completed and planned fencing;
- A recommendation for an ecological burn on the site in 2018, should no individuals of Somersby Mintbush or Spreading Guinea Flower be located in the conservation areas prior. This recommendation will be explored further, and other options considered, should it be required;
- Updated timing and frequency for monitoring and reporting, that is, annually for years 1 and 2, and once at the end of year 5;
- Photographic monitoring points; and
- Revised ecological performance criteria/targets for the five-year period.

To date the conservation zone has been managed as follows:

- The establishment of survey control points;
- Removal of Radiata Pine trees within the SMCA that were possible to access with a small excavator, without the excavator entering the SMCA;
- Erection of the temporary construction fence and the 2m high permanent security fence as per Court approved drawing SK09, which outlines fencing requirements ‘during construction’; and
- Erection of silt fencing and hay bale sediment controls.

2.6 Comparison of Approved and Proposed Operations

Table 12 presents “Approved/Current Operations”, “Proposed Expansion” and “Cumulative Impact of Total Operation, for each of the key matters identified by Council on page 1 of their Meeting Minutes.

Table 12: Approved and Proposed Operations

Aspect	Approved/Current Operations	Proposed Extension	Cumulative Impact of Total Operation	Reference
Hours of operation	24 hours	24 hours	There is no change proposed to the hours of operation that apply to the existing manufacturing plant, that is both the existing plant and extension will operate over a 24-hour period.	SEE, Section 3, Page 14.
Noise	Refer to noise impact assessment in Section 2.2 and Appendix B.			
Dust/air quality	Refer to air quality impact assessment in Section 2.3 and Appendix C.			
Traffic	Total number of light vehicle movements per day = approximately 280 Total number of heavy vehicle movements per day = approximately 108 Total number of vehicle movements per day (light and heavy) = approximately 388	Total number of light vehicle movements per day = approximately 240 Total number of heavy vehicle movements per day = approximately 106 Total number of vehicle movements per day (light and heavy) = approximately 346	With the existing flows on Wisemans Ferry Road adjacent to the site being in the order of 5,000 vehicles this would increase the daily flows to 5,346, an increase of around 7% over the existing flows. The Traffic Impact Statement concluded that this will have a minimal impact upon the overall operation of Wisemans Ferry Road.	SEE - Section 5.1, Page 35 and Appendix C.
Stormwater quality	The current stormwater reticulation system does not include stormwater management systems to improve the quality of stormwater discharged from the site. Modelling suggests that runoff discharged from the current stormwater reticulation	As outlined in Section 2.4, the proposed stormwater management system includes a Gross Pollutant Trap and a stormwater retention/reuse tank. This proposed stormwater management system will significantly reduce pollutants in stormwater runoff from the proposed	The proposed stormwater management system will not only capture all stormwater runoff from impermeable surfaces associated with the proposed extension, but will redirect all stormwater from the current site into the proposed stormwater detention/reuse tank. The revised stormwater quality modelling estimated that the following pollution reduction could be	Section 2.4 of this report and revised Civil Engineering Report (Appendix D).

Aspect	Approved/Current Operations	Proposed Extension	Cumulative Impact of Total Operation	Reference
	system would not meet the GCC Pollution Reduction requirements for Total Suspended Solids (TSS) or Total Nitrogen (TN).	extension and will meet GCC Pollution Reduction requirements.	achieved for the total site; 81% for TSS, 62% for TP and 49% for TN, which exceeds the GCC pollution reduction requirements.	
Water reuse	Stormwater runoff from the current operations is not captured in a retention tank for reuse. Steam from the current manufacturing plant boiler is vented directly to the atmosphere.	It is estimated that up to 75 kL/day of stormwater will be reused in the new Hebel plant manufacturing process. This equates to an average annual reduction in potable water usage of 19.0 ML. Waste steam will be used to preheat the boiler water resulting in a significant reduction in steam vented to the atmosphere thereby reducing water loss.	The total operation will therefore benefit from an average annual reduction in potable water usage of 19.0 ML. There will also be a net saving of process water consumption from the total operation through the recovery of waste steam.	Section 2.4 of this report, revised Civil Engineering Report (Appendix D) and CSR.
Energy efficiency	The current operations use approximately 0.6GJ/m^3 gas and approximately 21kWh/m^3 electricity.	The proposed extension operations are estimated to use approximately 0.5GJ/m^3 gas and approximately 21kWh/m^3 electricity.	At full production the combined operations are estimated to use approximately 0.55GJ/m^3 gas and approximately 21kWh/m^3 electricity. However, it is likely that there would be up to 5% reduction in electricity consumption per m^3.	CSR.
Heat	Heat is produced from two main sources, the boiler and waste steam/condensate. The stack temperature of the current plant boiler is approximately 170°C. The steam is vented directly to	The stack temperature of the proposed plant boiler is likely to be approximately 120°C due to the installation of an economiser. Waste steam will be used to preheat the boiler water resulting in a significant	The total operation will therefore have a net reduction in heat emitted per m^3 of manufactured product.	CSR.

Aspect	Approved/Current Operations	Proposed Extension	Cumulative Impact of Total Operation	Reference
	the atmosphere.	reduction in steam vented to the atmosphere thereby reducing heat and water loss.		
Waste	The current operation produces approximately 180 tonnes of waste per month, of which approximately 150 tonnes is recycled.	The proposed extension operation is estimated to produce approximately 150 tonnes of waste per month, of which approximately 140 tonnes is recycled.	At full production the total operation is estimated to produce approximately 330 tonnes of waste per month, of which approximately 290 tonnes will be recycled.	
Built form impacts	The current Hebel manufacturing plant is housed in a large warehouse building that is located on the northern side of the property. The tallest structures that protrude from the warehouse are the boiler and the cement and lime storage silos.	The proposed extension involves the construction of another large warehouse type structure to house the new Hebel manufacturing plant. The new structure will be of a similar height form and colour as the existing manufacturing plant. The proposed extension will be located immediately south and adjoining the existing manufacturing plant.	The proposed extension is located immediately adjacent to the existing manufacturing plant, will be similar in height form and colour as the existing manufacturing plant and the total operation is located within the Somersby Industrial Park, surrounded by other industrial developments of a similar scale. The total operation is therefore unlikely to have a significant impact on the visual amenity of the Somersby Industrial Park or on residential or commercial property owners that have views towards the site.	Elevation Plans and Existing Approval and Proposed Development Plan.

From this comparison of the approved operations and the proposed extension, it is evident that the total development is either going to have reduced environmental impacts compared with the approved development or will result in insignificant changes to the level of impact.

3 CONCLUSION

CSR is proposing an extension to their existing Hebel manufacturing plant in Somersby, NSW.

Potential environmental impacts associated with the proposed extension project have now been fully assessed in the following documentation:

- DA and supporting documents prepared by Catalyst Project Consulting and lodged on behalf of CSR in May 2016;
- Documentation prepared by Catalyst Project Consulting dated 10 August 2016 in response to various queries and requests from Council for additional information (refer to Council's emails dated 4 and 7 July 2016); and
- This Outstanding Information report prepared by PACT to address additional information outlined by Council in Meeting Minutes dated 13 September 2016.

These assessments have all concluded that the proposed extension to their existing Hebel manufacturing plant will not significantly increase the environmental impacts of the total development compared with the existing or approved development and therefore the proposed development is not designated development.

APPENDIX A

CSR HEBEL PRODUCTION PROCESS

APPENDIX A

Existing CSR Hebel Process Flow

Raw Materials

Steel Wire

Sand

Water

Cement

Lime

Water

Aluminium

Water

Raw Material Preparation

Reinforcement Mesh Production

Steel wire is straightened, cut to length and then welded into a mesh or cage.

Ball Mill

Sand is ground to a fine powder through a wet ball mill process which creates a sand slurry.

Reinforcement Mesh Preparation (Corrosion Protection etc.)

The mesh/cages are dipped in an anticorrosion paint and dried ready for assembly into a mould.

Sand Slurry

Waste Slurry

Waste concrete from the cutting process is mixed with water to make a slurry and reused in future mixes.

Mixer

All components are measured and then added to the mixer where they are combined ready for pouring.

Mixing/ Pouring and Curing

Mould Preparation (Cleaning/Oiling)

Mould Assembly

The reinforcement is assembled into the mould, aligned and then locked into place.

Mould Pouring

The concrete mix is poured over the reinforcement. It then rises before setting in the curing tunnel.

Mould Curing

The concrete is cured for 3.5 to 4 hours before the mould is lifted.

Mould Lifting

Cutting/Profiling

The panels are cut in the “green” state and then profiled if required.

Cooking

Autoclaving

The “green” concrete is cooked in an autoclave for ~6hours where the concrete gets its strength and turns white.

Packaging

Packing

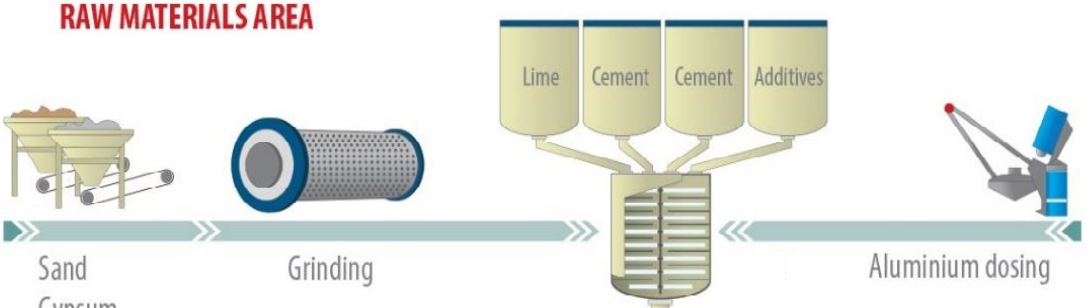
The product is packaged to protect against damage and for marketing.

Warehouse

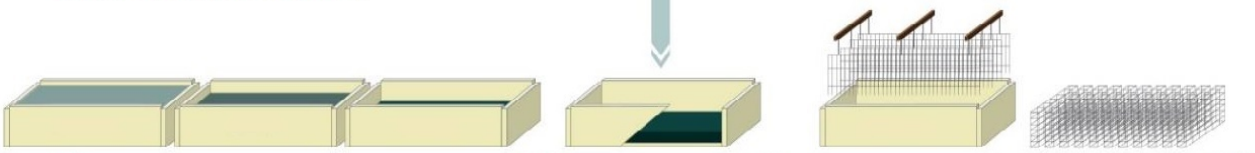
Product is stored in the warehouse before being shipped either direct to the customer or to other distribution centres.

Proposed CSR Hebel Process Flow

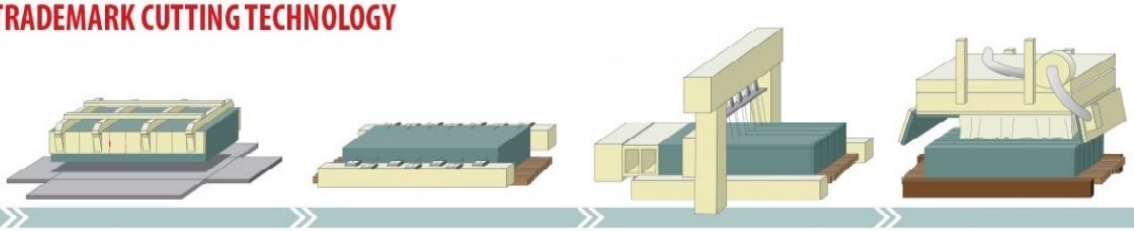
RAW MATERIALS AREA



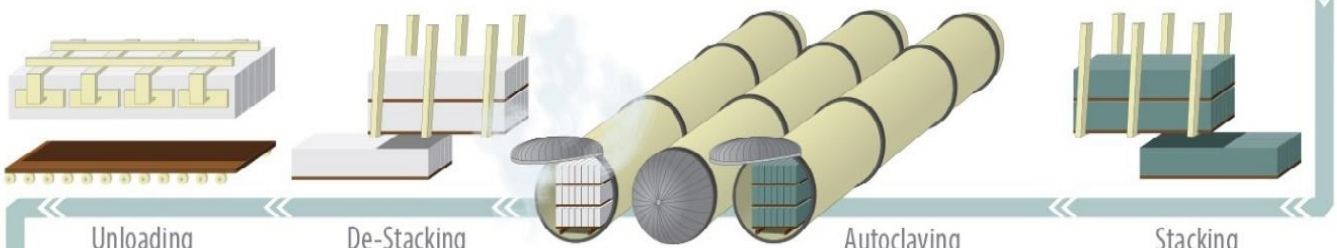
RISING + REINFORCEMENT



TRADEMARK CUTTING TECHNOLOGY



AUTOCLAVING + UNLOADING



PRODUCT PACKING

APPENDIX B

NOISE IMPACT ASSESSMENT

APPENDIX B

APPENDIX C

AIR QUALITY IMPACT ASSESSMENT

APPENDIX C

APPENDIX D

CIVIL ENGINEERING REPORT

APPENDIX D

APPENDIX E

CONSERVATION AREA MANAGEMENT PLAN AND STATEMENT OF COMPLIANCE

APPENDIX E


PACT.