MOUNT BARKER
DISTRICT COUNCIL

NOTICE OF MEETING

Notice is hereby given that the following meeting will be held in the Council Chambers of the Local Government Centre, 6 Dutton Road, Mount Barker on Wednesday 16 February 2022.

9.30am Council Assessment Panel

A. Humphries
ASSESSMENT MANAGER

9 February 2022

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MOUNT BARKER DISTRICT COUNCIL

COUNCIL ASSESSMENT PANEL

Wednesday 16 February 2022, 9.30 am

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2. CONFLICT OF INTEREST DECLARATION

3. CONFIRMATION OF MINUTES

3.1. That the minutes of the meeting held on 15 December 2021 as circulated to members be confirmed as a true and accurate record of proceedings.

4. BUSINESS DEFERRED

Nil.

5. REPORTS BY OFFICERS

5.1. DEVELOPMENT ACT APPLICATIONS

5.1.1. NON-COMPLYING APPLICATIONS

5.1.1.1 SUMMARY DETAILS

Application No.	580/292/21
Applicant	Holcim (Australia) Pty Ltd
Subject Land	1/2 Childs Road, Littlehampton, LOT: 98 FP: 160275 CT: 5792/221
Ward	North Ward
Proposal	Partial change in land use to a concrete batching plant with associated structures, offices, amenities, car parking and landscaping.
Development Plan	Mt Barker District Council Consolidated 20 August 2020
Zone	Light Industry Zone
Form of Assessment	Non-complying
Public Notification	Category 3
Representations	None
Persons to be heard	None
Agency Consultation	Environmental Protection Authority (EPA)
Responsible Officer	Randall Richards
Main Issues	Land use, interface (noise, amenity), parking, traffic, storm water
Recommendation	Grant Development Plan Consent subject to conditions and advisory notes.

ATTACHMENT 1: Application Documents
ATTACHMENT 2: Site Photos
ATTACHMENT 3: EPA Response Document

1. PROPOSAL

1.1. Detailed Description of Proposal

The proposed development involves a partial change in land use to a concrete batching plant with associated structures, offices, amenities, car parking and landscaping.

Proposed Land Use

The applicant provided the following description (edited for clarity):

> *Holcim proposes to construct and operate a concrete batching plant (CBP) for the manufacture and distribution of pre-mixed concrete.*

The proposed layout is designed to conform to the existing characteristics of the site. The Lower Level is to be utilised for the primary operations of the proposal involving the majority of the fixed plant such as silos, slump stands, washout bays, wedge pits, generator and batch office. Vehicles will utilise the existing crossover and driveway via Childs Road to access the Lower Level. The concrete mixing operations are to be located towards the northern retaining wall, with vehicle manoeuvring and operations taking place centrally within the battle axe shaped area.

The Lower Level of the site is a suitable location for the bulk of the batching operations.

The Upper Level is to be utilised primarily for batch office, parking, aggregate storage, unloading, staff amenities and vehicle manoeuvring.

Concrete batching is a manufacturing process where cement, cementitious materials, fine aggregate (sand), coarse aggregate, admixtures and water are proportionated and mixed to produce pre-mixed concrete. The proportions and quantities used vary, depending on the particular specifications and required strength class.

The raw materials of sand and gravel will be transported to the site in heavy vehicles (truck and dog). The aggregate and sand will be delivered to the holding hoppers by front end loaders in the Upper Level of the site. The aggregate materials are then weighed via weigh hoppers, located directly beneath the material holding hoppers.

The cement, fly ash and other cementitious materials will be delivered in tankers and pneumatically blown into the silos. The cementitious material will be held in silos and then discharged via weigh hoppers, directly into transit mixers.

The material will be batched to meet the required concrete specifications and in accordance with customer requirements. The batching process involves loading the truck mounted mixers with the raw materials, cement, other cementitious material, water and admixtures. Additional water may then be added to achieve the required consistency, which occurs within the designated slump stand bays. The concrete is then kept in an agitated state during delivery to the customer's site, by the slow rotation of the mixer drum.

When the concrete agitator trucks return, any residual concrete material will be poured into block moulds or washed out of the agitator bowls within the designated washout area. After allowing the solids to settle, the water will be re-used in the batching process. The solid waste material will be collected and stored in drying pits / solid waste bins and this material will then be either recycled or disposed of by a licensed waste contractor.

Operational Elements

The applicant proposes to operate 24 hours per day, 7 days a week in order to meet the demand of construction work which can occur around the clock.

The delivery of raw materials will be limited to 7:00am to 10:00pm to minimise noise impacts during the night time.

The facility will have a maximum annual production rate of 30,000m^3 per year (70,000 tonnes per annum).

The reports provided with the application provided staffing estimates ranging from 5 to 8 people, and noted that staffing requirement can vary seasonally. This assessment is conservatively based on a maximum of 8 staff on site at one time.

No fuels, oils or lubricants will be stored on the site. All major maintenance of the plant, including front end loader, heavy vehicles and trucks will be undertaken by an authorised contractor, or taken off site. Fuel for the operations will be supplied by nearby service stations.

Building Works, Site Works & Equipment

Buildings and equipment proposed on the site include:

- Aggregate storage bins.
- Cement and fly ash silos.
- Slump stand area.
- Above ground water storage tanks (4 x 25KL).
- First flush tank.
- Elevated office ("batch office").
- Demountable buildings (staff amenities and lunch room).

The proposal provides parking spaces for 10 light vehicles and 6 concrete agitator trucks. Access to the lower level will be via the existing driveway along the southern boundary and access to the upper level will be via a new crossover to Childs Road.

Two retention/settlement basins are proposed (1 on each level of the site).

Landscaping opportunities are provided along the front and rear boundaries of the site.

Refer to **Attachment One (1)** for the plans and reports detailing the proposal

2. BACKGROUND

The proposed concrete batching plant is a non-complying, Category 3 kind of development located directly south of "Littlehampton Bricks and Pavers" and a Landscaping Supplies, but contained on the same allotment.

The site is tiered to create substantially different ground levels to support commercial uses. The site is currently vacant used and devoid of vegetation, however it is understood the rear (lower) portion of the site was previously used for temporary concrete batching and then by an asphalt construction contractor.

3. SUBJECT SITE AND LOCALITY

The site forms a proportion of the existing allotment known as 2 Childs Road, Littlehampton held in Certificate of Tile Volume 5792 Folio 221. It has a frontage of 89m and an area of 8,900m^2 (approximates).

The site has two distinct levels, which generally sit below the adjacent road level, as follows:

- The road in front of the site slopes from about RL 347 to 341.
- The front portion of the site has an average level of RL 341-342 (excluding a stockpile of fill).
- The rear "battle axe" portion of the site is set a further 5m-7m lower at RL 335-336. The difference in ground levels is already retained with concrete blocks some 6m high.

Existing minor buildings located at the rear of the site will be demolished as part of this development. The site is sparsely vegetated but for some grasses, weeds and trees on/overhanging the rear boundary. No native vegetation will be affected by the proposal.

The site is located in a partially developed Light Industry Zone which has interfaces to a number of other zones. Childs Road is a no-through road (for vehicles) which feeds north into a secondary arterial road; Old Princes Highway.

The locality includes the following:

- The northern end of the allotment contains "Littlehampton Bricks and Pavers" which will remain distinct and separate from the proposed development.
- The Littlehampton sawmill, an automobile wrecker, and an unrelated concrete batching plant are located east of the site.
- A corridor containing dense vegetation and the South Eastern Freeway is located south of the site.
- Recreational land is observed west of the site including a remote control racing car track and Anembo Park (softball, baseball, tennis, playground).
- Dwellings exist at the extremities of the locality at approximately 235m north, 200m east and 170m south of the site. The dwellings to the south do not have a line of sight to the development as the freeway forms a raised crest in-between. The dwellings to the east have three (3) light industrial sites and a reserve between them and the proposed site.

Figure 1: Aerial photo of site and surrounds

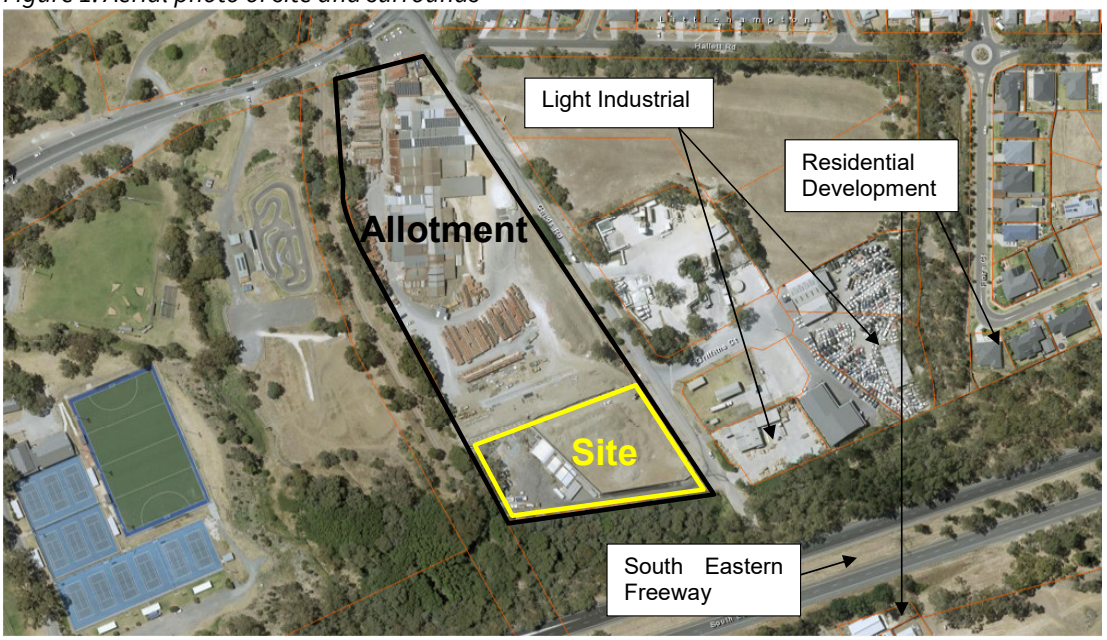
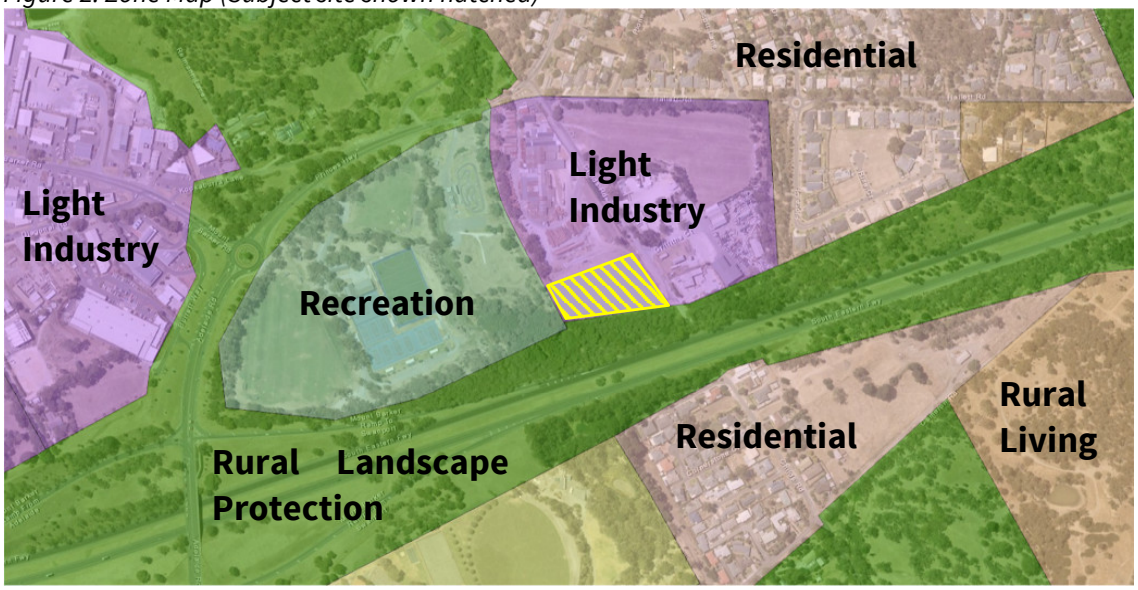


Figure 2: Zone Map (Subject site shown hatched)



4. PROCEDURAL MATTERS

4.1 Assessment Pathway

Land Use Definition (General industry)

The proposed land use is considered to constitute "general industry" as defined by Schedule 1 of the *Development Regulations 2008*:

> *general industry means any industry other than a service industry, light industry or special industry;*
>
> *[where] industry means the carrying on, in the course of a trade or business, of any process (other than a process in the course of farming or mining) for, or incidental to—*
> *(a) the making of any article, ship or vessel, or of part of any article, ship or vessel; or*
> *(b) the altering, repairing, ornamenting, finishing, assembling, cleaning, washing, packing, bottling, canning or adapting for sale, or the breaking up or demolition, of any article, ship or vessel; or*
> *(c) the getting, dressing or treatment of materials (and industrial will be construed accordingly);*

Council staff determined this to be a Non-complying kind of development in accordance with the "Procedural Matters" section of the Light Industry Zone as it involves general industry located within 100m of a non-industrial zone boundary (refer to Zone mapping).

Non-complying development must undergo a rigorous assessment process, however Council ultimately has discretion to determine the application according to its planning merits.

Council staff determined to "proceed to an assessment" of this Non-complying development under delegated authority, pursuant to Regulation 17(3) of the *Development Regulations 2008*. This application is presented to the Council Assessment Panel for a decision because it is a Non-complying kind of development.

The State Commission Assessment Panel is not required to provide concurrence due to the legislative planning reform.

5. PUBLIC NOTIFICATION

The application defaults to Category 3 for the purpose of public notification as it involves non-complying development.

The application was advertised in accordance with Section 38(5) of the *Development Act 1993*. Adjacent land owners were notified in writing and an advertisement was placed in The Courier newspaper on the 14th of July 2021, inviting the public to comment on the application. There were no representations received as part of the notification process.

6. GOVERNMENT AGENCY SUBMISSIONS (EPA)

6.1 Environment Protection Agency (EPA)

The application was referred to the Environmental Protection Authority (EPA) as it involves an "Activity of Major Environment Significance" in the form of "Concrete Batching Works", as set out by Schedule 22, Part A Activities, Item 22-2(5) of the *Development Regulations 2008*.

In determining this response the EPA had regard to and sought to further the objects of the *Environment Protection Act 1993*, and also had regard to:

- the General Environmental Duty, as defined in Part 4, Section 25 (1) of the Act; and
- relevant Environment Protection Policies made under Part 5 of the Act.

The EPA has considered Environmental Issues such as Evaluation Distance, Air Quality, Noise and Water Quality, with comments on Construction Management (see below).

Evaluation Distance

The nearest sensitive residential receiver (dwelling) is located approximately 170m south of the proposed facility. The EPA publication *Evaluation distances for effective air quality and noise management* (2016) recommends an evaluation distance of 200 metres between the activity of concrete batching and a sensitive land use to assess potential adverse impacts to air quality and noise.

Air Quality

Air quality consideration for concrete batching facilities include, dust generation from vehicle movements on unsealed working areas, disturbance by vehicles of cement and aggregate dust on the ground, blow-outs from cement storage silos, and vehicles loading and unloading. There is also the potential for dust generation with delivery of sand and aggregates, cement and fly ash, loading of aggregate weigh-hoppers and loading of trucks.

The EPA note: "*The risk of 'air quality' environmental harm arising from operations is considered low and any operational issues can be managed via an Environmental Management Plan for the site and conditions as part of a future EPA licence".* The EPA has directed a condition to confirm the dust filter and extracting requirements.

Noise

The hours of operation proposed are 24 hours per day. The sources of noise may include loading/unloading of materials, associated vehicle movements (including reversing beepers), the vibration of the concrete agitator and general machine noise from the batching plant. A noise report prepared by WSP titled *Holcim Littlehampton Concrete Plant Development Application Acoustic Assessment* dated 20 January 2021 was provided with the development application.

With the proposed mitigation strategy of not permitting concrete tanker or quarry aggregate deliveries during the night-time period (10pm on any day until 7am on the next day) the noise report demonstrates compliance with the noise criteria. This is satisfactory to the EPA and a condition is directed below in this regard.

Water Quality

Stormwater Management

"Water quality in South Australia is protected by the Environment Protection (Water Quality) Policy 2015 and the Environment Protection Act. In particular, section 25 of the Environment Protection Act imposes a general environmental duty on anyone who undertakes an activity that pollutes, or has the potential to pollute, to take all reasonable and practicable measures to prevent or minimise environmental harm."

Stormwater and wastewater management for the site would involve a closed system comprising capture, treatment and re-use within the concrete batching process. The site has been divided into four stormwater catchments being A, B, C and D. Catchment C is considered to represent the highest risks to stormwater. To manage stormwater from catchment C a 40kL first-flush tank is proposed to be located at the lowest point in the catchment and would capture the first 20mm of rain. All stormwater in catchment C would be directed to this tank via v-drains or channels. This water would then be pumped to a stirrer pit for re-use on site. Runoff exceeding the volume of the first flush tank would remain within catchment C. The grading of catchment C would allow for an additional 100kL of stormwater to be retained within that area when the first-flush tank is full. A 1%AEP for catchment C equates to 50.3kL, meaning even if the first-flush tank is full and a 1%AEP occurs, catchment C has the capacity to retain all stormwater flows. Runoff from events above this volume would be directed to the bio-retention basin proposed for the south-west corner of the site.

The proposed stormwater management strategies at the site is satisfactory to the EPA and a condition is directed to ensure the stormwater system is constructed prior to operation and as proposed.

Chemical and Fuel Storage

No fuels, oils or lubricants would be stored on the site. All major maintenance of the plant, including front end loader, heavy vehicles and trucks would be undertaken by an authorised contractor, or taken off site. This is satisfactory to the EPA.

Waste Management

Any residual concrete material is proposed to be poured into block moulds or washed out of the agitator bowls within the designated washout area. The solid waste material would be collected and stored in drying pits / solid waste bins and this material would then be either recycled or disposed of by a licensed waste contractor. This is satisfactory to the EPA.

The EPA concludes the proposed development is considered to present low impact to the surrounding environment if constructed and operated according to the information provided. Suitable controls are proposed to control dust and noise emissions and the closed reuse wastewater facilities are suitable, but should be monitored during operation. A number of conditions and notes have been directed by the EPA should the Council Assessment Panel resolve to grant consent.

7. COUNCIL DEPARTMENT COMMENTS

7.1. Council's Assets and Infrastructure Section

Access
Access to the site is via Childs Road adjacent and on to the Princes Highway intersection by making use of the existing access location to the land. Site lines at this location are acceptable in both directions. The existing access is for residential use therefore, Council will require the access crossover to be designed and constructed to a standard to cater for the proposed commercial traffic, including sealing the verge to protect the edge of Childs Road, and to prevent drag out on to the road.

Stormwater
A stormwater plan for the whole of the site has previously been approved as part of the earthworks and retaining application over the site. Stormwater discharge from the development will not exceed pre-development flows. Council Engineers have considered the EPA response to the water quality for the site and any water captured in the first-flush tank as well as the basins would be re-used on site. It is estimated that almost 40kL of water would be needed on a daily basis for operational works. If the volumes of runoff exceed production, the extra water would be removed from site via trade waste.

Summary and Recommendation

Council's Development Engineer is satisfied in relation to the traffic and stormwater management for the site, and in conjunction with the EPA conditions have added conditions where needed.

7.2. Council's Development & Environmental Services Section

There is no CWMS at the site and the it has been agreed with Council that a holding tank will be used in the interim until the site is serviced by CWMS. Recommended conditions regarding wastewater servicing form part of the recommendation.

8. SUMMARY OF KEY ISSUES

This report recommends that Development Plan Consent be granted because the proposal has a satisfactory performance in relation to the following key considerations:

- Land use – The Light Industry Zone is considered to provide an appropriate location for this development, particularly because the development will be compatible with surrounding industrial activities and will not unreasonably affect the amenity of nearby non-residential zones.
- Interface – The development complies with the relevant noise criteria and will not unreasonably affect the amenity of nearby land in terms of odour, fumes, dust, traffic, operating hours etc.
- Character – The appearance of the development is commensurate with the appearance of other development in this industrial locality.
- Car parking – Ten car parking spaces are proposed which will sufficiently cater to the parking demand caused by approximately 8 staff.
- Traffic – The applicant has supplied a traffic impact assessment which estimates a peak hour traffic generation of under 20 vehicle trips to and from the site, which can be accommodated within the surrounding road network.
- Stormwater – Stormwater discharge from the development will not exceed pre-development flows and will be treated to achieve an appropriate quality.

9. ASSESSMENT

9.1 Relevant Development Plan Provisions

The development application is required to be assessed against the Development Plan in effect at the time of lodgement, being the Mount Barker (DC) Development Plan Consolidated – 20.8.20.

Light Industry Zone Objectives: 1-4
Light Industry Zone Principles of Development Control (PDCs): 1-2, 4, 6-12,
Advertisements Objectives: 1, 2, 3
Advertisements PDCs: 1, 2, 3, 5, 6, 11, 15, 16, 17, 22
Bulk Handling and Storage Facilities Objectives: 1
Bulk Handling and Storage Facilities PDCs: 1-4
Crime Prevention Objectives: 1
Crime Prevention PDCs: 1-3, 5-6, 8, 10
Design and Appearance Objectives: 1-2
Design and Appearance PDCs: 1-3, 5-9, 11-13, 15-16, 18
Hazards Objectives: 1-2, 4-7, 10
Hazards PDCs: 1, 3-4, 7-8, 10, 13, 24-29
Industrial Development Objectives: 1, 3, 4, 5, 6, 7, 8
Industrial Development PDCs: 1-9, 11-14
Infrastructure Objectives: 1, 5
Infrastructure PDCs: 1, 4
Interface between Land Uses Objectives: 1-3
Interface between Land Uses PDCs: 1-2, 6-9, 12
Landscaping, Fences and Walls Objectives: 1-2
Landscaping, Fences and Walls PDCs: 1-4, 6-7
Natural Resources Objectives: 1-8, 10-11, 12-13
Natural Resources PDCs: 1-2, 4, 6, 8, 10-23, 25-27
Orderly and Sustainable Development Objectives: 1-4

Orderly and Sustainable Development PDCs: 1, 3-4, 7-9, 12-13
Siting and Visibility Objectives: 1
Siting and Visibility PDCs: 1-6, 9-10
Sloping Land Objectives: 1
Sloping Land PDCs: 1-3, 7
Transportation and Access Objectives: 2
Transportation and Access PDCs: 1-2, 8, 14, 16-19, 29-30, 36, 38-39, 41-48
Waste Objectives: 1, 2
Waste PDCs: 1-2, 5

While all of the above provisions are considered relevant, only the key issues of this proposal are discussed in detail below.

9.2 Land Use

The Zone is intended to be developed with light industry, service industry, store, warehouse and commercial land uses which are compatible with one another and cause minimal external impact on adjacent activities (Zone Objectives 1-3 and PDC 1).

While "general industry" is Non-complying in the Zone, a concrete batching plant is considered to be similar to, and compatible with, the industrial and commercial land uses anticipated in the Zone.

In addition, this is considered a suitable location for the proposed land use because:

- It achieves adequate separation from dwellings and sensitive receivers (Zone Objective 2).
- It benefits from buffers provided by surrounding vegetation and topography (Zone PDC 10).
- It is located in proximity to, and will conveniently service, Mount Barkers growth areas (Industrial Development Objective 1; Orderly and Sustainable Development Objective 1 and PDC 4).
- The site levels have already been substantially modified/tiered in a manner that suits the proposed use.
- The use will not prejudice other industrial type activities in the Zone (Industrial Development Objective 5; Orderly and Sustainable Development Objective 3 and PDC 1). In support of this point, there is an existing concrete batching plant adjacent this site at the corner of Childs Rd and Griffiths Ct.
- The character and appearance of the development is considered appropriate for a Light Industry Zone (Zone PDC 6-8).
- The office component is ancillary to the primary use of the land and will not undermine other zones within the Council (Zone PDC 4).

9.3 Character

Development in the Zone should address the street and contribute to a pleasant environment through landscaping; human scale elements; and the screening of car parking and outdoor storage areas (Zone Desired Character).

Outdoor storage is discouraged in the Zone, particularly visible to the Freeway and at the intersections of Childs Road and Hallet Road (Zone Desired Character). While the land use requires extensive outdoor storage areas by necessity, such areas will not be readily visible to these roads.

To expand upon the point above, the development will have very little visibility to the South Eastern Freeway as it is on lower ground, does not protrude above ridgelines, is substantially screened by existing vegetation, and will be some 60m from the Freeway (Zone PDC 8).

Approximately 10% of the site will be landscaped as sought by Landscaping Fences and Walls PDC 2, and in fact the proposal increases the site's landscaping in accordance with the Desired Character of the Zone. Further, a reasonably proportioned landscaped area is proposed at the front of the site which will assist with screening the parking, manoeuvring and outdoor storage areas. A reserved matter is recommended, requiring a detailed landscaping plan prior to Development Approval being issued.

Raw materials such as sand are indicated to be stored in an orderly and contained manner. It is anticipated that stockpiles can only reach a limited height. Such an arrangement is not considered to create any detrimental visual impacts or result in any inconsistencies with the Zone provisions referenced above. Further, the outdoor storage areas will have minimal visual impact to land outside the zone due to road setbacks, screening and due to the site being located at the end of a cul-de-sac.

The majority of the batching activities and structures are located on the lower rear portion of the site, thus having negligible visual impact upon the streetscape or the broader locality.

The upper front portion of the site will contain 3 small office/amenity buildings. These buildings do not address the street as anticipated by the Zone provisions. Council agrees with the applicant's planning consultant however that "the proposed CBP includes ancillary buildings only and does not benefit from having any buildings or structures facing the primary street frontage. It is considered that appropriately screening the plant and providing an efficient layout for access and operational purposes are more important factors in the design of the site" (Design and Appearance PDC 12).

The proposed office/amenity buildings are considered to incorporate suitable scale, design, materials, setbacks and will appear as permanent fixtures on the land, rather than transportable buildings (Design and Appearance PDCs 1, 4-7). The development is not considered to comprise bulky structures or excessive blank walling facing public view (Design and Appearance PDCs 2-3).

The development requires little modification of existing ground levels, and instead takes advantage of existing site levels / site features, while minimising the need for further earthworks (Sloping Land PDC 1 and 2(c)). This proposal does not include new excavation, filling and retaining walls of over 1.5m high (Sloping Land PDC 7).

Overall, the development is of suitable design, appearance and character, particularly supported by the location of the land in this secluded part of the Light Industry Zone.

9.4 Interface between Land Uses

The "Interface between Land Uses" section of the Development Plan contains provisions which seek development located and designed to minimise adverse conflict between land uses, to protect community health and amenity, and to protect desired land uses from incompatible development (IBLU Objectives 1-3). Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through dust, noise, odour, vibration, light spill, glare, operating hours and traffic impacts. Development should be sited and designed to minimise negative impacts on existing and future land uses (IBLU PDC 2). Development that emits noise should include noise attenuation measures that achieve the Environmental Protection (Noise) Policy (IBLU PDC 8). Where

necessary, development incorporate air pollution control measures to prevent harm to human health or unreasonable interference upon amenity (IBLU PDC 12).

The main potential interface impacts for this development include noise, dust, traffic and operating hours. These issues are assessed as follows.

Noise

Potential noise sources from this development include vehicle movements; loading/unloading of materials; and the operation of plant and equipment.

The applicant has provided an Acoustic Assessment which considered the relevant Development Plan policies and the Environmental Protection (Noise) Policy 2007. The report's methodology appears generally sound, although the consultant did not consider it necessary to apply a 5dBA noise character penalty (eg to account for reverse beepers on concrete agitator trucks).

The acoustic assessment determined that noise levels from the proposed development are predicted to comply with the Noise Policy requirements for both daytime and night time operation, provided raw materials are not delivered to the site during the night time period (10pm on any day until 7am on the next day). Without this intervention, the noise criteria would be exceed for 3 residential properties during the night time period.

The proposal is considered to satisfy the relevant Development Plan policies in relation to noise and the EPA assessment concurred on this basis with a condition is directed to be added.

Air Quality (Dust)

Air quality may be affected by truck movements; loading/unloading/handling of raw material, exhaust emissions from plant and equipment, and wind gusts disturbing stockpiles of raw materials.

The applicant has provided an Air Quality Impact Assessment which considered the ongoing operation of the development.

The Air Quality Assessment determined that dust emissions from the proposed development would generally be "minor" and comfortably within relevant air quality criteria. Cumulative impacts from the proposed development and adjacent activities would also be within the air quality criteria.

Section 8.0 of that assessment recommended a number of measures that are required to minimise potential air quality impacts comprising;

- Keeping hardstands and sealed roads clean and free of dusty material as much as possible;
- Limiting drop heights of dusty materials;
- Reduce rate of earthworks on windy days or if visible dust is leaving site;
- Install and maintain a dust filter system in the cement silo;
- Raw material bins shall be enclosed on three sides to reduce potential for wind-blown emissions;
- Material transfer points to be covered where practicable;
- Aggregate bins should be enclosed on three sides; and
- Trucks hauling raw materials should have their payload covered.

The recommendations above are incorporated into the suggested conditions of consent.

Traffic

The proposed land use represents a very low traffic generator based on the Traffic Impact Assessment Report provided by the applicant. Appendix B, Figure B5 estimates there will be less than 20 total vehicle movements to and from the development during peak hours.

Traffic volumes will be reduced at night time as raw materials will not be delivered to the site.

The majority of vehicles will access the site via the arterial road network and Childs Road. Commercial/industrial vehicles are not required to travel through residential local roads in order to access the site (Transportation and Access PDC 16).

The proposed volume, type and direction of traffic is not considered to cause unreasonable interference upon the amenity of the locality (IBLU PDC 1).

Operating Hours

24 hour operation is considered reasonable as the proposal complies with the relevant noise guidelines, raw materials will not be delivered to the site during the night time period, and because other interface impacts caused by the proposed development are considered to be within reasonable limits. Importantly, this is a Light Industry Zone, where it is not unreasonable or unusual for some activities to operate around-the-clock.

9.5 Car parking

The Development Plan parking rate for general industry would only require 1 car parking space for this development, based on its limited building floor area of only 54m^2. Clearly, this rate is not appropriate for this particular land use which involves large outdoor areas.

The application proposes 10 parking spaces for passenger/light vehicles, plus 6 bays for concrete agitator trucks. This is considered to be adequate given there will be a maximum of 8 staff on-site at one time. Observations of the adjacent concrete batching plant also suggest that this form of development involves a relatively low number of staff and associated parking (i.e. there appears to be less than 10 staff spaces required on the adjacent site).

In the rare event that more than 6 concrete agitator trucks, or more than 1 tanker truck, attend the site at once, then there is considered to be ample room for vehicles to queue/manoeuvre on the site without impeding the adjacent road network.

Therefore, the proposed car parking supply is considered to meet the anticipated demand, satisfying the intent of Transport and Access Objective 2(c), PDC 38 and PDC 39.

Council's Development Engineers support the dimension, layout and design of the proposed car parking areas (Transport and Access PDCs 36, 41, 47).

9.6 Traffic

Transport and Access (T&A) Objective 2 seeks development that provides safe and efficient traffic movements which makes effective use of existing transport networks.

There is considered to be sufficient trafficable space to allow all vehicles sufficiently manoeuvre on site and enter and exit the site in a forward motion. (T&A PDC 8, 18).

A separate car park is provided for passenger vehicles, which minimises the interaction between passenger and commercial/industrial vehicles (T&A PDC 17).

The creation of an additional access into the site is supported despite T&A PDC 14 as it supports to separate vehicle types, the proposal does not rely upon on-street parking, and in any event there is considered to be ample capacity for on-street parking within the locality.

The applicant's Traffic Impact Assessment estimates there will be less 20 total vehicle movements to and from the development during peak hours. This will not exceed the capacity of surrounding roads and intersections and will cause minimal disruption to existing traffic flows (T&A PDC 2, 30).

Site and convenient traffic conditions will be maintained for the site and locality for the reasons above (T&A Objective 2).

9.7 Stormwater

Stormwater management for the site would involve a closed system comprising capture, treatment and re-use within the concrete batching process. The site has been divided into four stormwater catchments being A, B, C and D. Catchments (A, B and D) have been considered to be dirty areas (e.g aggregate storage area and driveway), rather than contaminated areas, and therefore stormwater has been proposed to be captured and treated via a wedge pit, sedimentation basin and bio-retention basin. The EPA note: *The sedimentation basin has been sized for the 5-day 90th percentile flow, in accordance with the International Erosion Control Association (IECA) guidelines.* Overflow from both the wedge pit and sedimentation basin would be directed to the bio-retention basin.

Catchment C is considered to represent the highest risks to stormwater. To manage stormwater from catchment C a 40kL first-flush tank is proposed to be located at the lowest point in the catchment and would capture the first 20mm of rain. All stormwater in catchment C would be directed to this tank via v-drains or channels. This water would then be pumped to a stirrer pit for re-use on site. Runoff exceeding the volume of the first flush tank would remain within catchment C. The grading of catchment C would allow for an additional 100kL of stormwater to be retained within that area when the first-flush tank is full. A 1%AEP for catchment C equates to 50.3kL, meaning even if the first-flush tank is full and a 1%AEP occurs, catchment C has the capacity to retain all stormwater flows.

The proposed stormwater management strategies at the site is satisfactory to the EPA and Council with a condition directed by the EPA to ensure the stormwater system is constructed prior to operation and as proposed. It is considered that the stormwater management for the site meet the EPA standards and Councils Development Plan provisions.

9.8 Signage

The proposed signage will include at the entrance to the site of 2.4 metres wide x 1.2 metres high, the height from ground level will not exceed 5.0 metres to meet the signage guidelines for an Industrial Zone. The site will contain safety signage with information regarding the personal protective equipment requirements for the site.

10. CONCLUSION

The proposal involves a change of use to a concrete batching plant with associated building work.

It is a Non-complying and Category 3 development and no representations were received during the public notification period.

The Light Industry Zone is considered to provide an appropriate location for this development despite its non-complying designation. The concrete batching plant will be compatible with surrounding industrial activities and will not unreasonably affect the amenity of nearby non-residential zones.

The development complies with the relevant noise and air quality criteria and will not unreasonably affect the amenity of nearby land in terms of dust, traffic and operating hours etc.

The appearance of the development is commensurate with the appearance of other development in this industrial locality. The development will have little visibility from the South Eastern Freeway as it will be screened by vegetation and will be situated on lower ground.

Ten car parking spaces are proposed which will sufficiently cater to the parking demand caused by approximately 8 staff.

The applicant has supplied a Traffic Impact Assessment which estimates a peak hour traffic generation of under 20 vehicle trips to and from the development, which can be safely and functionally accommodated within the surrounding road network.

Stormwater discharge from the development will not exceed pre-development flows and will be treated to achieve an appropriate quality.

Council's Development Engineer is satisfied in relation to traffic and stormwater issues and the EPA are satisfied with the proposal.

Taking all relevant planning matters into consideration, the subject proposal sufficiently satisfies the applicable planning provisions to warrant Development Plan consent being granted.

11. RECOMMENDATION

It is recommended that the Council Assessment Panel:

RESOLVE that the proposed development is not seriously at variance with the policies in the Mount Barker District Council Development Plan, consolidated 20 August 2020.

RESOLVE to GRANT Development Plan Consent to the application by Holcim (Australia) Pty Ltd for a partial change in land use to a concrete batching plant with associated structures, offices, amenities, car parking and landscaping at 1/2 Childs Road, Littlehampton (Development Application 580/292/21) subject to the following reserved matter, conditions and advisory notes:

Reserved Matter

1. A landscaping plan shall be submitted to the Assessment Manager for approval that includes additional landscaping and nominates the planted location and species.

Council's conditions of consent:

2. The development herein approved to be carried out in accordance with the stamped plans and details accompanying this application, except where amended by the following conditions, including:
    - Planning Assessment Report/Statement of Effect – Application for Development Plan Consent-general industry (Concrete Batching Plant) at 2 Childs Road, Littlehampton SA 5251;
    - Stormwater Management Plan (Concrete Batching Plant Littlehampton) Prepared for Holcim (Australia) Pty Ltd, File Ref:2452.800.001 – dated 14 October 2021;
    - Proposal Plans, Holcim-Littlehampton (Mt. Barker) Concrete Plant Concepts-Layout dwg no-9050-R-PE-DG-001, sheet 6 of 9, Rev N, Holcim-Littlehampton (Mt. Barker) Concrete Plant Concepts-Typical Plant, dwg no-9050-R-PE-DG-001, sheet 5 of 9, Rev L, Holcim-Littlehampton (Mt. Barker)
    - Concrete Plant Concepts-Side Elevation, dwg no-9050-R-PE-DG-001, sheet 7 of 9, Rev L, Holcim-Littlehampton (Mt. Barker)
    - Concrete Plant Concepts-Front Elevation, dwg no-9050-R-PE-DG-001, sheet 8 of 9, Rev L, Holcim Australia Pty Ltd Littlehampton,
    - Lunch Room Plan Layout and Elevations, Groundwork Plus, Drawing Number:2452.DRG.009B, dated 27 November 2020, Holcim Australia Pty Ltd Littlehampton,
    - Batch Office Plan Layout and Elevations, Groundwork Plus, Drawing Number:2452.DRG.009C, dated 27 November 2020, Holcim Australia Pty Ltd Littlehampton,
    - Orthophoto and Contour Plan (2020-02-12), Groundwork Plus, Drawing Number:2452.DRG.014, dated 22 January 2021, Holcim-Littlehampton (Mt. Barker) Concrete Plant Concepts-Traffic Flow dwg no-9050-R-PE-DG-001, sheet 9 of 9, Rev N,
    - Traffic Transport plus, Re: Littlehampton Concrete Batching Plant Response to Information Request-dated 28 July 2021, Holcim Site Signage-Entrance Signage-PPE Icon
    - Signage, Littlehampton Concrete Plant-Design Criteria - Branding.

3. The following operational aspects to manage dust must be adhered to at all times to the satisfaction of Council:
   - work areas to be dampened down when required, all trafficable areas on site shall be paved and/or sealed for good site management;
   - use of dust suppressants and shielding to silos/storage bins where possible, cement and fly ash silos shall be fitted with overfill protection and dust filtration systems. The dust filtration systems and filters shall be properly maintained and the use a burst bag detector system that has ducting to 1 metre of ground level adjacent to the silo-filling pipe and;
   - to minimise transportation of air borne materials, incoming and outgoing truckloads shall be covered, trucks leaving the premises shall be clean and truck loading bays roofed and enclosed.

4. That effective **soil erosion and drainage control** measures be implemented during the construction of the development and on-going use of the land in accordance with this consent to:
   a. prevent silt run-off from the land to adjoining properties, roads and drains;
   b. control dust arising from the construction and other activities, so as not to, in the opinion of Council, be a nuisance to residents or occupiers on adjacent or nearby land;
   c. ensure that soil or mud is not transferred onto the adjacent roadways by vehicles leaving the site;
   d. ensure that all litter and building waste is contained on the subject site in a suitable bin or enclosure;
   e. ensure that no sound is emitted from any device, plant or equipment or from any source or activity to become an unreasonable nuisance, in the opinion of Council, to the occupiers of adjacent land; and
   f. following construction of a stage, ensure all disturbed land is managed to prevent silt runoff and dust.

5. All requirements in regard to the **construction of driveways and carparks** are to be met, including:
   a. The driveway crossover shall be designed, drained, constructed and sealed with asphalt or concrete suitable for commercial traffic providing both structural integrity and traction in both wet and dry conditions and include adequate stormwater drainage. The use of unbound materials (gravel, or quarry rubble) is not acceptable.
   b. The driveway internal to the property shall be surfaced such that it is trafficable in all weather conditions and mitigates dust generated by vehicles.
   c. The road and driveway crossover between the back of kerb and the boundary shall be shaped to provide a verge slope no greater than 2.5 per cent fall towards the road where a footpath is present and a maximum 5% where no footpath is present, suitable for pedestrian traffic and in accordance with Councils current standards.
   d. The driveway and car parking areas shall be paved or surfaced, drained and marked to accepted engineering standards prior to the occupation of the development and shall be maintained in good condition at all times.
   e. That car parks and any traffic control devices be designed and constructed in accordance with AS 2890 –Off-Street Car parking, AS 1742 Manual of Uniform Traffic Control Devices and the Notice to Council (Part 1 and 2) under the Road Traffic Act 1961 from the Minister for Transport and Urban Planning (December 1999).

6. All requirements in regard to **storm water** are to be met, including:
   a. Management of stormwater shall occur generally in accordance with the drainage management plan submitted in support of the application.
   b. All stormwater from the batching plant shall be captured for reuse in production.
   c. All stormwater discharged from the car parking area shall be directed to the adjacent watercourse via a vegetated swale. The design and construction of the stormwater system shall be designed to prevent erosion of the watercourse and be approved by Council.
   d. Proposed finished floor levels shall be a minimum of 0.5m above the 100 year average recurrence interval flood level for watercourses to avoid inundation by floodwater.
   e. A system to improve stormwater quality shall be provided and constructed in a location and of a design to the reasonable satisfaction of Council to ensure that pollutants are trapped prior to exiting the site or entering the natural watercourse. The treatment system shall have a high capture efficiency for oils and petroleum/hydrocarbons.

EPA CONDITIONS

7. Deliveries from concrete tanker and quarry aggregate trucks must only occur between the hours of 7am and 10pm on any day of the week.

8. Prior to operation, the cement silo must be fitted with filling exhaust filters, high/low alarms and overfill protection kits, and an independent fail safe system consisting of a fully ducted and enclosed pressure release valve.

9. Prior to operation, the stormwater management system must be constructed in accordance with the Stormwater Management Plan, prepared by Groundwork Plus, dated October 2021 and the letter from Groundwork Plus (Sam Lyons) to the EPA titled Response to Environment Protection Authority Information Request, dated 18 October, 2021 and must include:
   a first-flush tank, sized at least 40kL, to be installed to capture stormwater from catchment C;
   b. grading in catchment C designed to capture and retain all stormwater generated in that catchment in a 1% AEP rain event;
   c. the establishment of a wedge pit, sedimentation basin and bio-retention basin to capture and treat stormwater from catchment A, B and D;
   d. any overflow of stormwater from catchment C to be directed to the proposed bio-retention basin;
   e. all wastewater from the washdown facilities to be retained in catchment C and;
   f. captured stormwater is re-used on site as required for operational needs.

Notes:

1. Any person proposing to undertake building work within the District of Mount Barker is reminded of their obligation to take all reasonable measures to protect Council infrastructure. Any incidental damage to the infrastructure - pipes, footpath, verge, street trees etc, must be reinstated to a standard acceptable to Council at the applicants' expense.

2. Prior to construction commencing the contractor shall undertake a condition survey of the adjoining roads and infrastructure and a CCTV of any Council underground infrastructure that may be affected by the works and again at completion of the works. Any damage shall be repaired to the reasonable satisfaction of Council.

3. As your proposed development includes construction works on Council roads or connections to Council assets you are advised that a Permit to undertake works that impact on Council infrastructure, Council Streets or Roads or Council controlled land (available on the Website) will need to be issued by Council prior to construction.

4. A Waste Control Application is required for any new septic tank and drainage system to be located within the development.

5. Any fill material brought to the site must be clean and not contaminated by construction or demolition debris, industrial or chemical matter, or pest plant or pathogenic material.

6. Retaining walls constructed to retain a difference in ground levels exceeding 1 metre in height require development approval.

7. The approval of a wastewater application to service the development will be required.

8. The applicant is reminded of its general environmental duty, as required by section 25 of the Environment Protection Act 1993, to take all reasonable and practicable measures to ensure that the activities on the whole site, including during construction, do not pollute the environment in a way which causes or may cause environmental harm.

9. An environmental authorisation in the form of a licence is required for the operation of this development. The applicant is required to contact the Environment Protection Authority before acting on this approval to ascertain licensing requirements. Information on applying for a licence (including licence application forms) can be accessed here: http://www.epa.sa.gov.au/business_and_industry/applying.Jor_a_licence. A revised Stormwater Management Plan should be included with the licence application which reflects all of the commitments made in the letter from Groundwork Plus titled: *Response to Environment Protection Authority Information Request - Application for Development Approval – Development Plan Consent for General Industry (Concrete Batching Plan) at 2 Childs Road, Littlehampton, SA, 5250*, dated 18 October 2021.

10. A licence may be refused where the applicant has failed to comply with any conditions of development approval imposed at the direction of the Environment Protection Authority.

11. EPA information sheets, guidelines documents, codes of practice, technical bulletins etc can be accessed on the following web site: http://www.epa.sa.gov.au

Item 5.1.1.1 - Attachment One (1)

MOUNT BARKER DISTRICT COUNCIL

AMENDED

Development application form

Development Act 1993

Mount Barker District Council
Received
24 Feb 2021

PO BOX 54 OR 6 Dutton Road
MOUNT BARKER SA 5251 MOUNT BARKER
TELEPHONE: (08) 8391 7200 FAX: (08) 8391 7299
www.mountbarker.sa.gov.au

Office use only
DEVELOPMENT NUMBER:
580 / /

Please use BLOCK LETTERS and Black or Blue ink so that photocopies can be made of your application

PLEASE TICK AS REQUIRED

Development Plan Consent ■ ***Building Rules Consent*** ☐ ***Development Approval (both)*** ☐

APPLICANT'S CONTACT DETAILS:
Name: Holcim (Australia) Pty Ltd Email: victoria.musgrove@lafargeholcim.com
Postal Address: 18 Little Cribb Street, Milton, QLD 4064 Phone: (07) 3259 1709

OWNER'S CONTACT DETAILS:
Name: 2 Childs Road Pty Ltd Email:
Postal Address: Phone:

BUILDER'S CONTACT DETAILS:
Name: Email:
Postal Address: Phone:

CONTACT PERSON:
Name: Sam Lyons (c/- Groundwork Plus) Email: slyons@groundwork.com.au

DESCRIPTION OF DEVELOPMENT:
Proposed Development (e.g. Dwelling, Shop, Garage): General Industry (concrete batching plant)
Existing Use (e.g. Vacant, Dwelling, Grazing): asphalt manufacturing plant / vacant

LOCATION OF PROPOSED DEVELOPMENT:
Assessment No: **Parcel No:** 98F160275
House No: 2 **Lot / Section No:** **Street:** Childs Road
Town: Littlehampton **Volume:** 5792 **Folio:** 221

BUILDING RULES CLASSIFICATION SOUGHT: Present classification:

If Class 5, 6, 7, 8 or 9 classification is sought, state the proposed number of employees: Male: Female:

If Class 9a classification is sought, state the number of persons for whom accommodation is provided:

If Class 9b classification is sought, state the proposed number of occupants of the various spaces at the premises:

Does either Schedule 21 (Activities of Environmental significance) or 22 (Activities of Major Environmental significance (EPA)) of the Development Regulations, 2008 apply? ■Yes ☐No

DEVELOPMENT COST (do not include shop fitout costs):$ 3,000,000

I acknowledge that copies of this application and supporting documents may be provided to interested persons in accordance with the Development Regulations, 2008.

SIGNATURE: Applicant / Owner / Agent **DATE:** 12 February 2021

RELEVANT FEES, COPIES OF PLANS & COPIES OF ANY OTHER RELEVANT SUPPORTING DOCUMENTATION ARE DUE ON SUBMISSION OF THIS APPLICATION

Government of South Australia

DEVELOPMENT REGULATIONS 2008
Form of Declaration (Schedule 5 clause 2A)

To: Mount Barker District Council

From: Holcim (Australia) Pty Ltd (c/- Groundwork Plus)

Date of Application: 16 / 02 / 2021

Location of Proposed Development: 2 Childs Road, Littlehampton (Lot 98 on F160275)

House No: _____ Lot No: 2 Street: Childs Road

Town/Suburb: Littlehampton

Section No (full/part): _____ Hundred: _____

Volume: 5792 Folio: 221

Nature of Proposed Development: Development Plan Consent for General Industry (Concrete Batching Plant) at 2 Childs Road, Littlehampton

I Sam Lyons **being the applicant/ a person acting on behalf of the applicant (delete the inapplicable statement) for the development described above declare that the proposed development will involve the construction of a building which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the Electricity Act 1996. I make this declaration under clause 2A(1) of Schedule 5 of the Development Regulations 2008.**

Signed: _____ **Date:** 11 / 02 / 2021

Government of South Australia

Note 1

This declaration is only relevant to those development applications seeking authorisation for a form of development that involves the construction of a building (there is a definition of 'building' contained in section 4(1) of the Development Act 1993), other than where the development is limited to –

a) an internal alteration of a building; or
b) an alteration to the walls of a building but not so as to alter the shape of the building.

Note 2

The requirements of section 86 of the Electricity Act 1996 do not apply in relation to:

a) an aerial line and a fence, sign or notice that is less than 2.0 m in height and is not designed for a person to stand on; or
b) a service line installed specifically to supply electricity to the building or structure by the operator of the transmission or distribution network from which the electricity is being supplied.

Note 3

Section 86 of the Electricity Act 1996 refers to the erection of buildings in proximity to powerlines. The regulations under this Act prescribe minimum safe clearance distances that must be complied with.

Note 4

The majority of applications will not have any powerline issues, as normal residential setbacks often cause the building to comply with the prescribed powerline clearance distances. Buildings/renovations located far away from powerlines, for example towards the back of properties, will usually also comply.

Particular care needs to be taken where high voltage powerlines exist; or where the development:

- is on a major road;
- commercial/industrial in nature; or
- built to the property boundary.

Note 5

An information brochure: 'Building Safely Near Powerlines' has been prepared by the Technical Regulator to assist applicants and other interested persons.

This brochure is available from council and the Office of the Technical Regulator. The brochure and other relevant information can also be found at **sa.gov.au/energy/powerlinesafety**

Note 6

In cases where applicants have obtained a written approval from the Technical Regulator to build the development specified above in its current form within the prescribed clearance distances, the applicant is able to sign the form.

LAND SERVICES SA

Product	Title Details
Date/Time	24/12/2020 02:24 PM
Customer Reference	245201A1 210
Order ID	20201224006455

Certificate of Title

Title Reference	CT 5792/221
Status	CURRENT
Easement	NO
Owner Number	71189947
Address for Notices	UNIT 1, 2 CHILDS RD LITTLEHAMPTON, SA 5250
Area	3.26HA (APPROXIMATE)

Estate Type

FEE SIMPLE

Registered Proprietor

2 CHILDS ROAD PTY. LTD. (ACN: 641 739 764)
OF UNIT 1 2 CHILDS ROAD LITTLEHAMPTON SA 5250

Description of Land

ALLOTMENT 98 FILED PLAN 160275
IN THE AREA NAMED LITTLEHAMPTON
HUNDRED OF MACCLESFIELD

Last Sale Details

Dealing Reference	TRANSFER (T) 13323679
Dealing Date	25/06/2020
Sale Price	$0
Sale Type	NO MONETARY CONSIDERATION

Constraints

Encumbrances

Dealing Type	Dealing Number	Beneficiary
MORTGAGE	10543053	NATIONAL AUSTRALIA BANK LTD.
MORTGAGE	10619940	NATIONAL AUSTRALIA BANK LTD.

Stoppers

NIL

Valuation Numbers

Valuation Number	Status	Property Location Address
5810784006	CURRENT	2 CHILDS ROAD, LITTLEHAMPTON, SA 5250

Notations

Dealings Affecting Title

LAND SERVICES SA

Product	Title Details
Date/Time	24/11/2020 04:37:07
Customer Reference	2452/DA1.310
Order ID	20201124006455

NIL

Notations on Plan

NIL

Registrar-General's Notes

CONTROLLED ACCESS ROAD VIDE PLAN 57
PLAN FOR LEASE PURPOSES VIDE G142/2005

Administrative Interests

NIL

Groundwork Plus Resources Environment Planning Laboratories
Phone: 1800 GW PLUS (1800 497 587)
Email: info@groundwork.com.au
Website: groundwork.com.au
ABN 13 609 422 791

16 February 2021

Ref: 2452.DA1.31.004

Chief Executive Officer
Mount Barker District Council
PO Box 54
MOUNT BARKER SA 5251

Via email: lodgement@mountbarker.sa.gov.au

Dear Sir/Madam

APPLICATION FOR DEVELOPMENT APPROVAL – DEVELOPMENT PLAN CONSENT FOR GENERAL INDUSTRY (CONCRETE BATCHING PLANT) AT 2 CHILDS ROAD, LITTLEHAMPTON, SA 5250, PROPERLY DESCRIBED AS PART OF LOT 98 ON F160275

Groundwork Plus has been engaged by Holcim (Australia) Pty Ltd, to prepare an application for Development Plan Consent for General Industry (Concrete Batching Plant) at 2 Childs Road, Littlehampton.

The comprising application has been prepared in accordance with Part 4, Division 1, Subdivision 3, Section 39(1) of the *Development Act 1993*, being the mandatory information required for an application to the relevant authority:

(a) The application has been made using the appropriate form determined by the Minister.

(b) The application includes all information required by the relevant authority.

(c) The application has been lodged with the required accompanying drawings / plans.

(d) The application fee will be paid in accordance with Council's Development Application Fees Schedule.

We have enclosed a Planning Assessment Report and associated attachments in support of the application. If you have any queries regarding this matter, please do not hesitate to contact me by telephone on (07) 3871 0411, or by email: slyons@groundwork.com.au. We look forward to receiving Council's acknowledgement of this application.

Yours faithfully
Groundwork Plus

Sam Lyons
Town Planner

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PO 1779, Milton BC Qld 4064
Phone: +61 7 3871 0411
Fax: +61 7 3367 3317

SOUTH AUSTRALIA
2/3 16 Second St, Nuriootpa SA 5355
PO Box 854, Nuriootpa SA 5355
Phone: +61 8 8562 4158

VICTORIA
PO Box 438, Altona VIC 3018
Phone: 0437 523 282

AGGREGATE TESTING LABORATORY
Unit 78/109 Leitchs Road
Brendale Qld 4500
Phone: 0417 615 217

GROUNDWORK plus

PLANNING ASSESSMENT REPORT / STATEMENT OF EFFECT

APPLICATION FOR DEVELOPMENT PLAN CONSENT - GENERAL INDUSTRY (CONCRETE BATCHING PLANT) AT 2 CHILDS ROAD, LITTLEHAMPTON SA 5251

Prepared for:
Holcim (Australia) Pty Ltd

Holcim

Date:
February 2021

File Ref:
2452.310.001

Document Control

Project/ Report Details

Document Title:	Planning Assessment Report: Littlehampton Concrete Batching Plant
Principal Author:	Sam Lyons
Client:	Holcim (Australia) Pty Ltd
Ref. No.	2452.310.001

Document Status

Issue	*Description*	*Date*	*Author*	*Reviewer*
1	Planning Assessment Report	15 February 2021	Sam Lyons – Town Planner	John Taylor – Principal Town Planner (BRTP, MPIA, MQELA, MIQA)

Distribution Record

Recipient	
Holcim (Australia) Pty Ltd	1e
Mount Barker District Council	1e

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FIGURES

ATTACHMENTS

1 Introduction

1.1 Scope

Groundwork Plus has been engaged by Holcim (Australia) Pty Ltd ('Holcim') to prepare an application to the Mount Barker District Council ('Council') seeking a Development Plan Consent for General Industry (Concrete Batching Plant) at 2 Childs Road, Littlehampton SA 5250, properly described as part of Lot 98 on F160275 (herein referred to as the 'site'). The Concrete Batching Plant ('CBP') is proposed to be located on part of this larger lot, which comprises an area of 8,991m^2 at the southern end, including use of the battle-axe shaped area within the site.

This Planning Assessment Report ('report') examines the relevant provisions of the *Mount Barker District Council Development Plan 2017* ('Development Plan'), the *Development Act 1993* ('the Act') and other relevant legislation. The purpose of this report is to describe the proposed activities and to assess the proposal against the applicable legislative requirements. This report is intended to ensure that sufficient information is provided to Council to make an informed decision on the proposal.

1.2 The Applicant

The applicant is Holcim (Australia) Pty Ltd. The parent company, Lafarge Holcim operates on a global scale. Within Australia Holcim supply concrete from a network of approximately one hundred and fifty concrete batching plants. Holcim are a well-respected corporate operator and operate under a culture and shared goal of "zero harm to people" and "zero harm to the environment".

1.3 Background and Site History

The northern end of the site contains an established brickwork operations (Littlehampton Bricks and Pavers Pty Ltd), which has operated for over 100 years. Littlehampton Bricks and Pavers Pty Ltd currently hold an Environment Protection Authority licence, issued by the Environmental Protection Agency ('EPA') for the following prescribed activities of environmental significance (refer **Attachment 1 – Existing Environmental Protection Authority Permit**):

2(4) **Ceramic Works**
7(3)(c) **Crushing, grinding or milling works (rock, ores or minerals)**
8(2)(a) **Fuel burning not coal or wood**

The brickworks have primarily operated in the northern half of the site while more recently, other activities have been undertaken on the southern portion of the site. The battle-axe shaped area of the site, located at the southern end is delineated by existing retaining walls which vary in height from 0.5 metres nearest to the Child Road frontage, up to approximately 6 metres at the western end of the site.

It is understood that a mobile concrete batching plant operated on the battle-axe shaped area of the site for a number of years, up until 2014.

From 2015, up until early 2020.an asphalt services company known as AAA Asphalt operated on the battle-axe shaped area of the site, as can be seen in **Figure 1 - Site Aerial**.

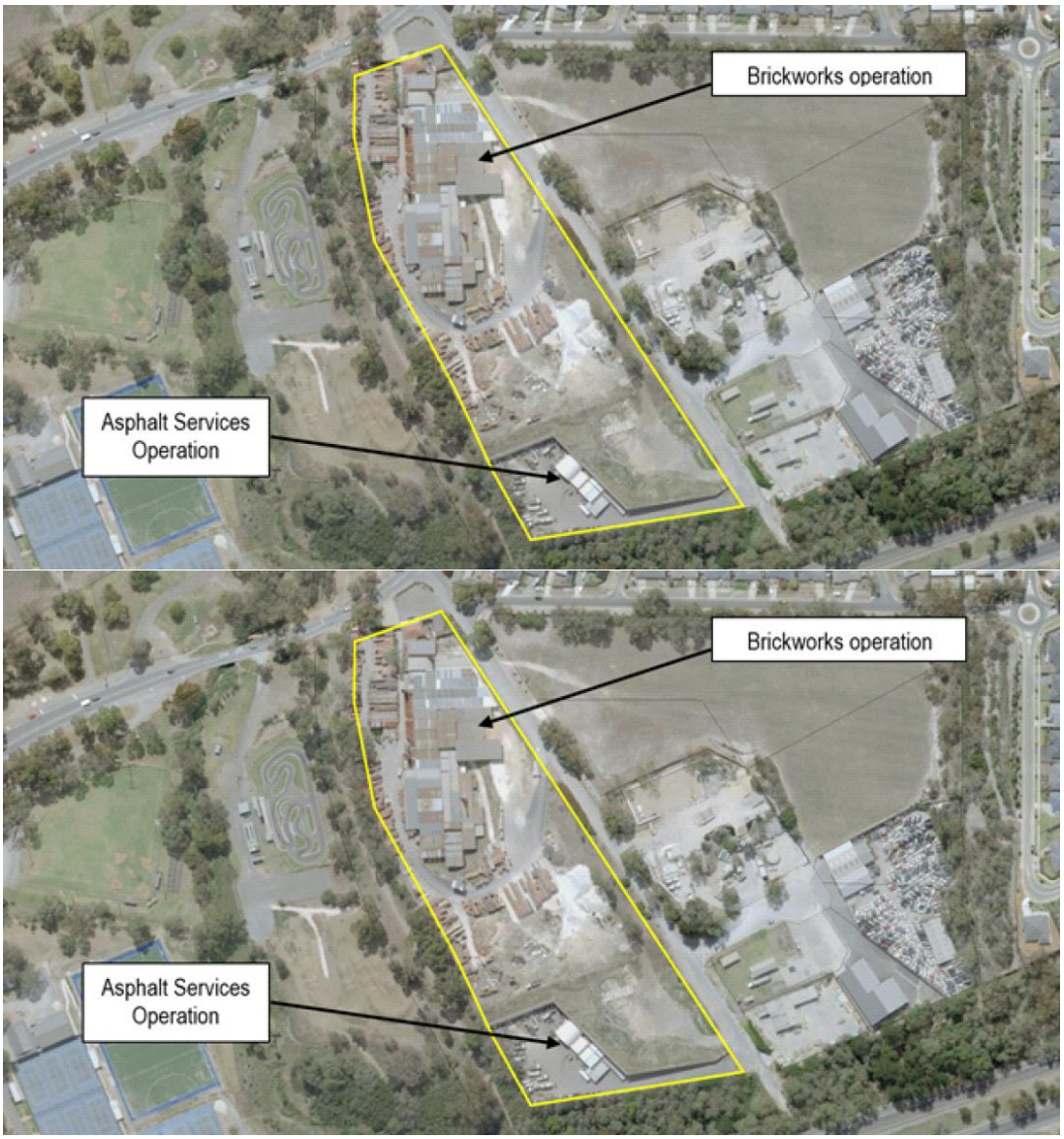

Figure 1 – Site Aerial (source: SAPPA Mapping)

1.4 Pre-lodgement Discussions

A pre-lodgement meeting was held with Council officers on Friday 28 February 2020 to discuss the proposed development. The proposal was generally supported by Council with the provision that specialist reporting would accompany development plan consent to address the following matters:

- Site layout;
- Traffic/access;
- Water quality; and
- Local amenity issues.

Council also confirmed that the application will be referred to the EPA.

A pre-lodgement meeting was held with EPA officers on Monday 24 February 2020 to discuss the proposed development. The EPA were also generally supportive of the proposal, provided it was suitably demonstrated that the concrete batching operations could achieve the relevant requirements of the Environmental Protection Policies (Air Quality, Water Quality and Noise).

2 Site Details

Location:	2 Childs Road, Littlehampton, SA 5251 (refer **Figure 2 – Site Location**)

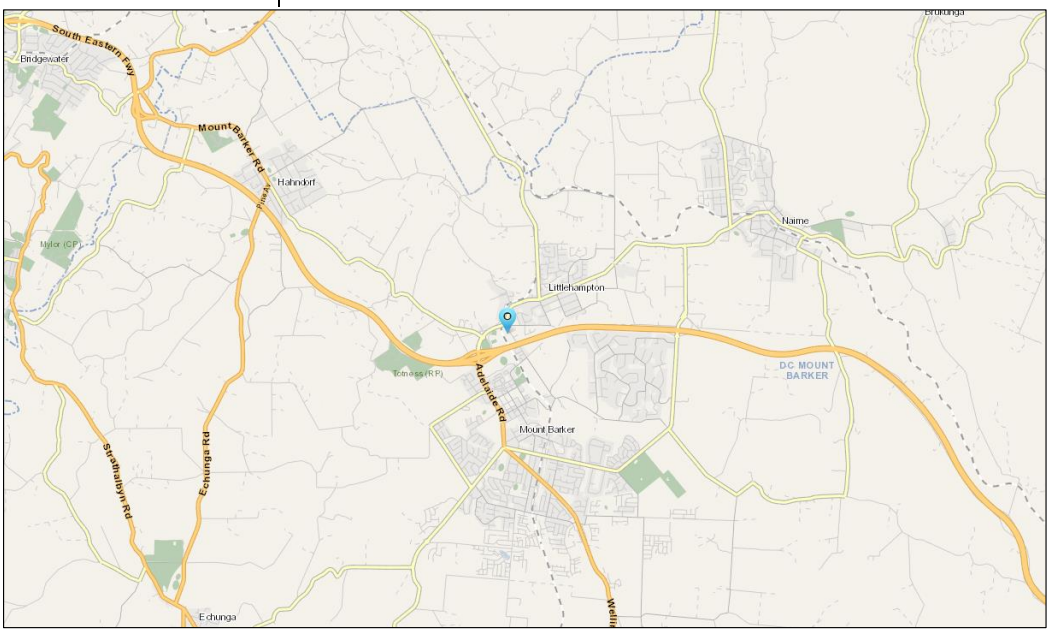

Figure 2 – Site Locality Plan

Real Property Description:	Part of Lot 98 on F160275
Landowner:	2 Childs Road Pty Ltd (refer **Attachment 2 – Title Search**)
Access:	Access to the site is via Childs Road
Total Site Area:	3.26 hectares
Local Authority:	Mount Barker District Council
Development Plan:	*Mount Barker District Council Development Plan 2017*
Land Use Definition:	General Industry

Zone: Light Industry Zone (refer **Figure 3 – Zone Plan**)

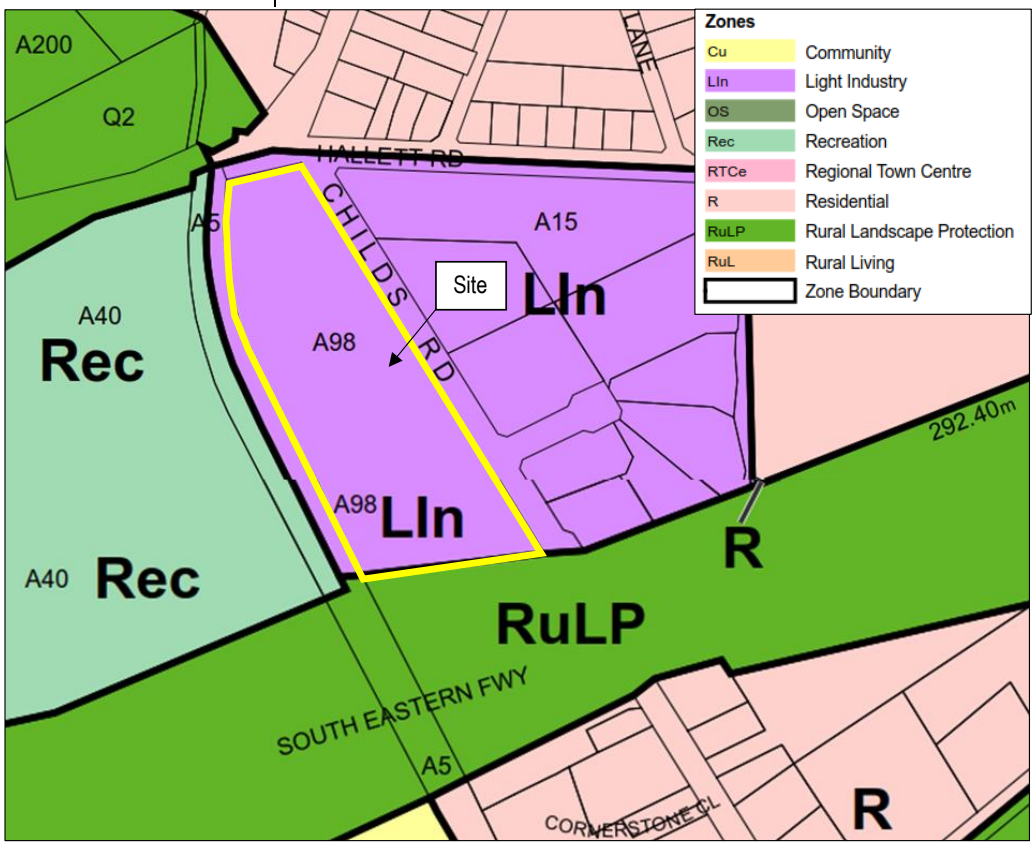

Figure 3 – Zone Plan (source: Mount Barker District Council Development Plan 2017 mapping)

Level of Assessment: Non-complying development

Surrounding Land Uses: Other compatible industrial uses are located in proximity to the site, including an existing concrete batching plant, a Caltex fuel depot, a car wreckers' operation and a sawmill. To the west, the site is adjoined by the rail line.

In the larger context, surrounding uses to the north and east of the site comprise vacant industrial land. The South Eastern Freeway is located to the south of the site. An open space/reserve is located immediately to the west of the site, which includes facilities for a radio-controlled car track. Further to the west, on the other side of Adelaide Road there are a number of other commercial/light industrial uses.

Residential dwellings are located further to the south across the South Eastern Freeway and to the north/east, over the hill crest. The nearest receptor is located approximately 170 metres from the boundary of the site, however does not have line of sight, due to the raised elevation of the freeway and crest of the hill, in between.

2.1 Site Characteristics

Topographically, the site predominantly follows a gentle slope falling away from the crest on Childs Road. Notably, there is a distinct difference in ground level between the brickworks area and the location of the battle-axe lot and adjacent land (the site).

The site supports very little vegetation. A number of trees are located along the eastern boundary of the site, adjacent to Childs Road. The application does not propose to impact upon, or remove any existing vegetation.

The site is currently accessed via three (3) existing crossovers (refer **Figure 4 – Site Access Locations**). The brickworks operation, in the northern portion of the site, gains access to the Old Princes Highway and Childs Road via two (2) separate crossovers. Access to the battle-axe area, in the southern section of the site (location of proposed CBP), is provided via a crossover at the southern end of Childs Road. Childs Road connects to Old Princes Road, which then feeds onto the higher order road network (South Eastern Freeway).

Figure 4 – Site Access Locations (source: SAPPA Mapping)

The area of the site relevant to the proposal comprises two (2) distinct levels that make up the development site for the CBP. For ease of reference these two levels are shown in **Figure 5** below. The detailed levels (contours) for the site have also been provided with the proposal plans (refer **Attachment 3 – Proposal Plans**).

Figure 5 – Upper and Lower Level of Development Site

The lower level is a hatchet shaped area that is characterised by the historic industrial activities that have been undertaken on that portion of the site. The lower level is currently vacant, however at the time of the photographs (February 2020) the site previously supported several temporary buildings, as well as plant and equipment associated with an asphalt manufacturing operation. The lower level is accessed via a bitumen sealed driveway from Childs Road, which slopes towards the south-western corner of the site. The lower and upper levels are separated by a retaining wall which reaches approximately 6 metres in height, as shown in **Plate 1** and **Plate 2** below.

Plate 1 – view north from Lower Level

Plate 2 – view west from access to Lower Level of site

The upper level is undeveloped and predominantly flat. A small portion of the area is currently used for the storage of materials related to the brickworks activities. A 2.5-metre-high Colourbond fence runs along the top of the retaining wall that delineates the two levels.

External to the site, a drainage gully is located between the southern boundary of the site and the South Eastern Freeway. The gully supports a large amount of weed infestation and vegetation, as shown in **Plate 3** below .

Plate 3 – view of gully looking south from Childs Road

3 Development Proposal

3.1 Details of Proposed Operation

Holcim proposes to construct and operate a CBP on part of the site (southern section of site – 8,991m^2) for the manufacture and distribution of pre-mixed concrete. The CBP will have a maximum annual production rate of 30,000m^3 per year (70,000 tonnes per annum). The proposed layout is designed to conform to the existing characteristics of the site. The Lower Level is to be utilised for the primary operations of the proposal involving the majority of the fixed plant such as silos, slump stands, washout bays, wedge pits, generator and batch office. Vehicles will utilise the existing crossover and driveway via Childs Road to access the Lower Level. The concrete mixing operations are to be located towards the northern retaining wall, with vehicle manoeuvring and operations taking place centrally within the hatchet shaped area (refer **Attachment 3 – Proposal Plans**).

The Lower Level of the site is a suitable location for the bulk of the batching operations as is it well shielded from surrounding land uses and the South Eastern Freeway via topography and vegetation. The Upper Level is to be utilised primarily for parking, aggregate storage, unloading, staff amenities and vehicle manoeuvring. Access to the Upper Level is proposed via a new crossover to Childs Road. Landscaping is proposed throughout the site including along the boundary with Childs Road.

A number of demountable buildings are proposed which include a staff amenities and lunchroom. Ten (10) designated staff and visitor parking spaces will be provided on the Upper Level. As the site is a wholesale outlet, all transactions are undertaken by phone or email. The main visitors to the site will be agitator trucks arriving to pick material up and will be directed to the lower level of the site which will contain the washout areas, load bay and slump stand.

No fuels, oils or lubricants will be stored on the site. All major maintenance of the plant, including front end loader, heavy vehicles and trucks will be undertaken by an authorised contractor, or taken off site. Fuel for the operations will be supplied by nearby service stations.

The proximity of the proposed CBP to the market will ensure the efficient and cost-effective supply of concrete to the region. The location of concrete batching operations in proximity to developed areas is necessary to ensure that the integrity of the product is not compromised and to ensure that the resultant cost of infrastructure and construction products is maintained at an affordable level. The location of CBPs, in proximity to end users, results in competitive pricing, a reduction in travel distance and congestion, and consequently an overall reduction in fuel consumption and greenhouse gas emissions.

3.2 Concrete Batching Process

Concrete batching is a manufacturing process where cement, cementitious materials, fine aggregate (sand), coarse aggregate, admixtures and water are proportionated and mixed to produce pre-mixed concrete. The proportions and quantities used vary, depending on the particular specifications and required strength class.

The raw materials of sand and gravel will be transported to the site in heavy vehicles (truck and dog). The aggregate and sand will be delivered to the holding hoppers by front end loaders in the Upper Level of the site. The aggregate materials are then weighed via weigh hoppers, located directly beneath the material holding hoppers.

The cement, fly ash and other cementitious materials will be delivered in tankers and pneumatically blown into the silos. The cementitious material will be held in silos and then discharged via weigh hoppers, directly into transit mixers (refer **Figure 6 – Conceptual Concrete Batching Plant Operations**).

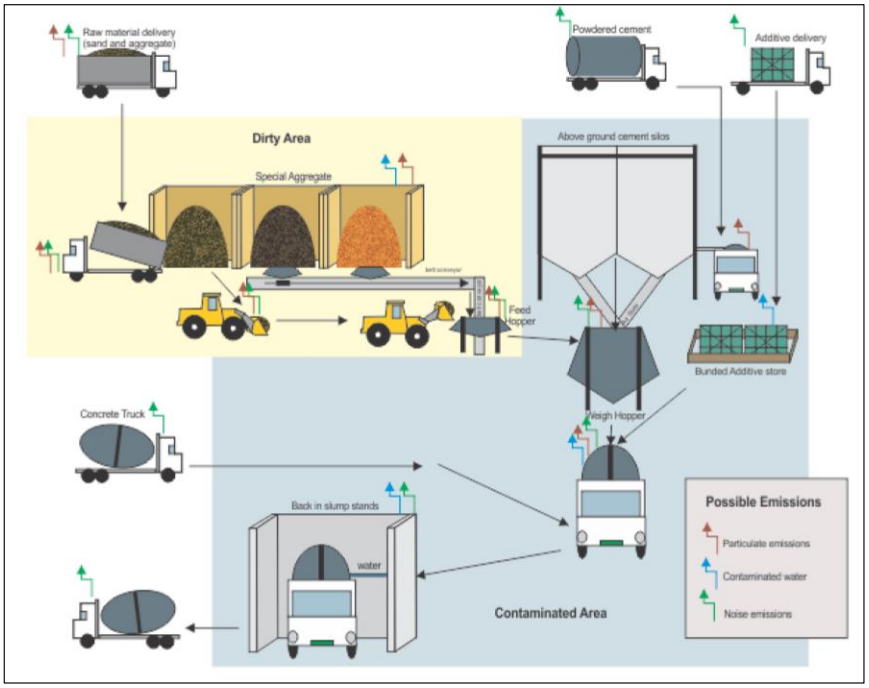

Figure 6 – Conceptual Concrete Batching Plant Operations

The material will be batched to meet the required concrete specifications and in accordance with customer requirements. The batching process involves loading the truck mounted mixers with the raw materials, cement, other cementitious material, water and admixtures. Additional water may then be added to achieve the required consistency, which occurs within the designated slump stand bays. The concrete is then kept in an agitated state during delivery to the customer's site, by the slow rotation of the mixer drum.

When the concrete agitator trucks return, any residual concrete material will be poured into block moulds or washed out of the agitator bowls within the designated washout area. After allowing the solids to settle, the water will be re-used in the batching process. The solid waste material will be collected and stored in drying pits / solid waste bins and this material will then be either recycled or disposed of by a licensed waste contractor.

3.3 Equipment

Equipment and facilities associated with the proposed CBP include, but are not limited to, the following:

- Aggregate storage bins;
- Cement and fly ash silos;
- Slump stand area;
- Above ground water storage tanks;
- First flush tank;
- Batch office;
- Demountable buildings (staff amenities and lunch room);

A front-end loader will be used on the Upper Level of the site to transfer material from the aggregate storage bins into the plant.

3.4 Hours of Operation

The proposed hours of operation for the CBP are twenty-four (24) hours a day, seven (7) days a week. Local authorities, State agencies and contractors are increasingly requiring maintenance and construction works to be undertaken at night, as well as public holidays and Sundays, due to factors such as minimised traffic disruption, safety, economics and scheduling.

The delivery of raw materials (including cement and aggregates) will be limited to 07:00 – 22:00 to ensure that the operation is able to comply with the relevant noise criteria.

3.5 Workforce

The demand for concrete products varies considerably, both daily and monthly, and accordingly the number of employees and contractors will vary. It is anticipated that the operation will employ approximately five (5) staff, plus contracted truck drivers.

3.6 Vehicle Parking and Access

A total of ten (10) light vehicle and six (6) concrete agitator truck parking spaces will be provided. Access will be via the existing driveway along the southern boundary of site and a new crossover to Childs Road. Traffic to the site is likely to consist of light vehicles, truck and dog tippers, B-doubles and agitator trucks.

3.7 Landscaping and Trees

Landscaping is proposed to be established along the Childs Road frontage, with an additional section of landscaping proposed in the north-eastern corner of the site.

4 Operational / Environmental Matters

The EPA is responsible for air and water quality, and the control of pollution, waste and noise. This section provides a review of the potential environmental impacts associated with the proposed CBP operation on the surrounding sensitive receivers.

4.1 Air Quality (Dust)

CBP operations involve the use of machinery and activities that have the potential to generate dust. These activities include, but are not limited to, the following:

- Truck/vehicle movements on site
- Loading, unloading and handling of raw material
- Movement of raw material on conveyors
- Exhaust emissions from plant and equipment
- Wind gusts of standing raw materials in storage bins.

A qualitative air quality impact assessment has been undertaken by AECOM for the proposed development using the UK Institute Air Quality Management's tool for operation and construction dust. The outcome of this assessment is that dust impacts due to construction and operation of the CBP are not anticipated to result in any significant air quality impacts to nearby sensitive receptors, provided the recommended operational controls are implemented (refer **Attachment 4 – Air Quality Impact Assessment**).

The following strategies / mitigation measures will be implemented into the operation of the CBP to prevent and minimise the potential dust emissions:

Work Areas / Trafficable Areas

- Dampen down work areas, internal roads and other hardstand areas by water spraying when visual surveillance indicates excessive dust generation and propagation from point or mobile sources.
- Pave and/or seal all trafficable areas on site.
- Enforce maximum speed limit of 15 km/hr on site.
- Prevent and clean up any spillages or dust accumulation on driveways or sealed surfaces.
- All elevated hoppers, conveyors and dusty transfer points shall be sheltered from the wind.
- Use water sprays or filtered dust extraction systems around gob hoppers and across open sides of enclosures.

Silos and Storage Bins

- Use dust suppressants and shielding where possible.
- Ensure that cement and fly ash silos are fitted with overfill protection and dust filtration systems, and properly maintain the systems and filters.
- Use a burst bag detector system that has ducting to 1 metre of ground level adjacent to the silo-filling pipe.

Transportation of Materials

- Ensure that incoming and outgoing truckloads of sand, aggregate and concrete wash out are covered during transport if there is a possibility dust may be emitted.
- Ensure that trucks leaving the premises are clean, focusing on draw bar and tail gate, to prevent material causing dust nuisance and being tracked onto external roads.
- Roof and enclose truck loading bays.

The controls nominated will require regular monitoring and review to ensure that performance accords with design criteria and also reflect the dynamic nature and changing needs of the operation. Daily visual surveillance will be undertaken by all employees to ensure dust generation on-site is controlled appropriately.

Dust and particulate monitoring will be undertaken at the request of the administering authority in accordance with the relevant conditions of approval. Dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter.

When requested to undertake monitoring, monitoring results are to be provided to the administering authority following completion of the monitoring event. Monitoring shall be carried out at a place(s) relevant to the potentially affected dust sensitive place and must include:

- for a complaint alleging dust nuisance, dust deposition
- for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (µm) (PM10) suspended in the atmosphere over a 24hr averaging time.

In the event that air quality monitoring (dust and/or particulate matter) determines an exceedance of the approved EPA limits, the Site Manager may engage the services of a suitably qualified person to determine additional management strategies to mitigate impacts. Additional air quality monitoring should be undertaken as necessary to determine the efficacy of the additional management strategies.

4.2 Noise

CBP operations involve the use of machinery and activities that have the potential to generate dust. These activities include, but are not limited to, the following:

- Electrical equipment
- On-site maintenance works
- Truck/vehicle movements on site
- Loading, unloading and handling of raw material
- Operation of plant (movement of conveyors, pumps, compressors

An acoustic assessment has been undertaken by WSP to determine the potential impacts to the existing noise environment caused by the proposed CBP (refer **Attachment 5 – Acoustic Assessment**). Attended noise measurements were taken in December 2020 to capture the existing noise environment in the locality of the site. The noise modelling has confirmed that the proposed development is predicted to comply with the requirements of the *EPA Environment Protection (Noise) Policy 2007*, for both daytime and night-time operation. This is subject to delivery of raw materials (including cement and aggregates) only occurring between the hours of 07:00 – 22:00 daily. All other proposed site activities have been confirmed as able to be carried out during both the daytime and night-time periods.

WSP's acoustic assessment has demonstrated that the proposed CBP can comply with the noise related provisions of the *Mount Barker District Council Development Plan 2017* and will not have a detrimental effect on the acoustic amenity of nearby sensitive receptors.

The proposed CBP will be operated in a way that protects the acoustic environmental values, in accordance with the *Environment Protection (Noise) Policy 2007*. The following noise control measures will be implemented to assist in mitigating noise associated with the site activities:

- Use broadband reversing alarms where possible to avoid potential nuisance associated with tonal characteristics of traditional reverse beepers.
- Ensure a site layout that enables product delivery and handling in such a way that reduces the need for reversing.
- Fixed engines, pumps and compressors are to be enclosed where practicable.
- Ensure all site equipment, machinery and vehicles are serviced in accordance with the original equipment manufacturers' specifications as a minimum.
- Ensure all modern mobile plant (e.g. front-end loaders, agitator trucks) are fitted with effective exhaust silencers.
- Equipment and machinery is to be shut down when not in use.
- Unnecessary operation of plant and equipment and revving of mobile or stationary motors and engines are to be avoided.
- Ensure that equipment at the site is used for the intended purpose.
- Ensure that any extraneous noises are rectified.
- Maintain hardstand surfaces in good condition (e.g. free of potholes and product spillages) and with suitable grades.

- Avoid the use of compression braking on product delivery trucks entering the site.
- Maintain a system for capturing complaints and addressing them.

4.3 Stormwater

All stormwater runoff within the operations area of the site will be directed, captured and re-used in the batching process to increase efficiency and reduce the potential for contamination external to the site. All stormwater runoff external to the proposed CBP will be diverted around the proposed operation. A Stormwater Management Plan has been prepared for the proposed CBP to outline the design details and operational management procedures that are to be maintained and/or adopted in order to integrate stormwater management into daily operations (refer **Attachment 6 – Stormwater Management Plan**).

In accordance with best practice industry standards, the site is delineated into three (3) distinct areas (or zones) so as to more efficiently manage the water quality requirements. The three (3) areas are commonly termed “clean”, “dirty” and “contaminated” areas.

Clean areas of the site are where there is no potential for surface water contaminants, including sediment, aggregates, sand, cement and/or any form of pre-mixed concrete. The clean areas will generally comprise those areas around the office and amenities, landscaping areas, the driveways and the light vehicle car parking area. In this instance and considering the design layout as proposed, the areas around the office and amenities, the northernmost driveway and the light vehicle car parking area (located on the Upper Level) have been conservatively included into the dirty area calculations, as they share the driveway and/or a drainage grade with the raw material deliveries.

Dirty areas are those parts of the operation where the only potential contaminant is sediment from truck deliveries and the sand and aggregate holding areas of the site. The dirty areas of the site do not have any notable volumes of concrete, concrete spillage or cementitious materials.

Contaminated areas include those areas of the site where cement is unloaded, or the concrete agitator trucks are loaded/unloaded and also where the agitator truck slumping occurs. Such areas are required to be sealed and bunded so that 100 percent of the first 20mm of rainfall is captured, treated and not able to be released until such contaminants have been removed. These delineated contaminated areas are also intended to contain any possible spills on the site and to enable a confined and rapid response to any required clean-ups on the site.

In order to ensure that contaminants are collected and treated within the identified contaminated areas for the operation, an in-ground first flush tank system is proposed to capture and treat the contaminated area shown as ‘Catchment C’. This tank will be located at the lowest point within the contaminated area and will also act as the wastewater treatment system, such that all surface flows will be directed via gravity to the first flush tank. If necessary, surface drainage such as concrete channels or spoon drains can be constructed to direct flows to the first flush tank. A volume of 40 kilolitres is proposed, which has been confirmed as adequate to capture the initial 20mm of runoff from the contributing catchment, in accordance with best practice industry standards.

The first flush tank is required to be kept empty at all times, to ensure that adequate volume is available prior to a rainfall event occurring. Captured water may be re-used in the operations where suitable, or otherwise removed from site via trade waste facilities.

A total of five (5) wedge pits (four (4) on the lower level and one (1) on the Upper Level) and a sediment basin (located on the Upper Level) are proposed to treat the aggregate storage areas (dirty areas) demarcated in Catchments A and B (refer to Figure 1 – Stormwater Management Plan of **Attachment 6 – Stormwater Management Plan**). A bio-retention basin is proposed on the western side discharge point, to provide treatment prior to discharge from the site. Overflows from the wedge pits and sediment basins will discharge into the bio-retention system for additional treatment.

4.4 Traffic

A Traffic Impact Assessment has been prepared by Traffic and Transport Plus to assess the potential operational impacts of the proposed CBP on the external road network (refer **Attachment 7 – Traffic Impact Assessment**).

Based on the results of SIDRA analysis, turn lane treatment assessment and a review of historic crash data, the additional traffic associated with the proposed CBP would only generate marginal impacts at the Old Princes Highway / Childs Road intersection, even in consideration of the somewhat conservative assessment approach adopted.

Improvement works would typically be considered to be required at the Old Princes Highway / Childs Road intersection even without the proposed CBP on the basis of the modelled operational scenarios. However, Council plans to upgrade the Old Princes Highway / Childs Road intersection to cater for future traffic growth – it is likely that that the upgraded intersection would operate safely and efficiently with the proposed CBP (as the proposed CBP would only generate a relatively small amount of additional traffic).

4.5 Bushfire

The site is devoid of any significant vegetation and it is considered that the risk from bushfire hazard is low. Nevertheless, the following management strategies are proposed to be implemented as part of the operations:

Risk Controls

- Prepare an evacuation plan for the site prior to commencement of activities.
- Ensure all staff on-site and other personnel are aware of evacuation procedures and the location and the use of firefighting equipment.
- Ensure there is an adequate water supply on-site in the event of a fire. Water supply sources that could be used include:
  - Sediment basins / water storage.
  - Water tank.
- Keep the operational areas tidy and not storing any material around the edges of the site that would increase bushfire risk.
- Maintain a site attendance register.
- Maintain a communications system with all on-site personnel.
- Keep relevant agencies contact numbers in the event of a fire.

Ignition Sources

- Appropriate signage is to be erected near flammable and combustible areas e.g. 'No smoking, stop engine', hazard symbols (explosive, flammable, combustible).
- Smoking is only permitted in designated smoking areas, and is not allowed in work vehicles.
- Ensure that any onsite welding and other hot works is undertaken in controlled areas where potential for starting a fire is minimised.

Fire Protection

- Ensure that extinguishers, fire hoses, fire blankets, sand buckets and other such equipment is regularly inspected and maintained in accordance with AS 1851-2012, Routine Service of Fire Protection Systems and Equipment.
- All vehicles and plant must be provided with fire protection equipment (e.g. fire extinguisher, fire blanket) that meets applicable Australian Standards.
- Staff should be trained in the correct use of fire protection equipment.
- All fire extinguishers must be clearly signed and their purpose clearly visible for the user.

The Site Manager will ensure regular surveillance of the site, to ensure the site access points and the edges of the site area are well maintained. All employees will be responsible for the identification and giving alarm of fires on-site or adjacent bush fires off-site. Should emergency fire services be required, '000' will be dialled.

4.6 Waste

Any waste generated, transported, or received as part of carrying out the CBP operation will be managed in a way that protects all environmental values. The type of wastes that may be generated at the site may include, but are not necessarily limited to the following:

- Regulated wastes (e.g. batteries, oil filters, waste oil/hydrocarbons and containers, oil/water emulsions and tyres)
- General waste such as food waste, packaging and consumables
- Green waste.

The following strategies / mitigation measures will be implemented into the operation of the proposed CBP to prevent and minimise the generation of waste on site:

Waste Avoidance
Waste avoidance relates to preventing the generation of waste or reducing the amount of waste generated. Reasonable and practicable measures for achieving waste avoidance may include, but are not necessarily limited to:

- Input substitution (using recyclable materials instead of disposable materials, for example using oil delivered in recyclable steel drums instead of non-recyclable plastic containers).
- Increased efficiency in the use of raw materials, energy, water or land (purchasing consumables in bulk (large containers) rather than in small quantities).
- Improved maintenance and operation of equipment (keep equipment in good working order to reduce wear and overhaul).
- Undertaking an assessment of waste minimisation opportunities from time to time.

Waste Reuse
Waste re-use refers to re-using waste, without first substantially changing its form. Reasonable and practicable measures for reusing waste may include, but are not necessarily limited to:

- Recovering and separating solvents, metals, oil, or components or contaminants and reusing separated solvents for degreasing plant and equipment.
- Reusing silt/sediment on-site to the maximum practicable extent.

Waste Recycling
Waste recycling refers to treating waste that is no longer useable in its present form and using it to produce new products. Reasonable and practicable measures may include, but are not necessarily limited to:

- Recovering oils, greases and lubricants for collection by a licensed oil recycling contractor, recovering, separating and recycling packaging (including paper, cardboard, steel and recyclable plastics).
- Recycling used plant and equipment to the maximum practicable extent.
- Providing suitable receptacles and storage areas for collection of materials for recycling.

Waste Disposal
This refers to disposing of waste which cannot otherwise be reused, recycled or used for energy recovery. Reasonable and practicable measures may include, but are not necessarily limited to:

- Disposal to a licensed waste disposal facility (i.e. landfill or transfer station).
- Approved on-site disposal.
- Only put inert, solid waste into industrial bins and general rubbish.

Waste Storage

Waste storage containers or areas are to be provided and located at safe and convenient locations at the site. Each container is to be identified with the type of wastes which may be disposed of in each container. Each container or area is to be designed to prevent the escape of materials.

The Site Manager will visually inspect to ensure the waste management hierarchy is being effectively implemented. All site personnel shall be responsible for ensuring wastes are stored and removed from the site on a regular basis (e.g. daily or weekly). The Site Manager shall ensure that waste treatment measures are implemented at the site.

The Site Manager shall ensure waste receptacles are provided and the waste type identified and that temporary waste storage areas are signed; recycling bins are emptied when full and materials which may cause land contamination are not stored on the site.

5 Planning Framework

5.1 Statutory Planning Process

5.1.1 Development Act 1993

The *Development Act 1993* ('Development Act') is the primary legislation enacted by the State Government to establish the planning and development system framework and many of the processes required to be followed within that framework. This includes the relevant processes for assessing development applications.

As per the Development Act, Part 4, Division 1, Subdivision 1, Section 32:

> *Subject to this Act, no development may be undertaken unless the development is an approved development.*

Section 33 of the Development Act states that consent must be provided by a relevant authority for a development to be approved, as follows:

> *1) A development is an approved development if, and only if, a relevant authority has assessed the development against, and granted a consent in respect of, each of the following matters (insofar as they are relevant to the particular development):*
>
> *a. the provisions of the appropriate Development Plan (development plan consent);*
>
> *b. the provisions of the Building Rules (building rules consent) …*

The Development Act defines 'development' as:

> *a) building work; or*
>
> *b) a change in the use of land; or*
>
> *c) the division of an allotment; or*
>
> *d) the construction or alteration (except by the Crown, a council or other public authority (but so as not to derogate from the operation of paragraph (e))) of a road, street or thoroughfare on land (including excavation or other preliminary or associated work); or*
>
> *da) the creation of fortifications; or*
>
> *e) in relation to a State heritage place—the demolition, removal, conversion, alteration or painting of, or addition to, the place, or any other work that could materially affect the heritage value of the place; or*
>
> *(f) in relation to a local heritage place—the demolition, removal, conversion, alteration or external painting of, or addition to, the place, or any other work (not including internal painting but including, in the case of a tree, any tree-damaging activity) that could materially affect the heritage value of the place; or*
>
> *(faa) the external painting of a building within an area prescribed by the regulations for the purposes of this paragraph; or*
>
> *(fa) in relation to a regulated tree—any tree-damaging activity; or*
>
> *(g) prescribed mining operations on land; or*
>
> *(ga) prescribed earthworks (to the extent that any such work or activity is not within the ambit of a preceding paragraph); or*
>
> *(h) an act or activity in relation to land (other than an act or activity that constitutes the continuation of an existing use of land) declared by regulation to constitute development, (including development on or under water) but does not include an act or activity that is excluded by regulation from the ambit of this definition;*

In accordance with Section 32 of the Development Act, a person must not undertake development, unless the development is approved development.

5.1.2 Development Regulation 2008

5.1.3 Referral Requirements

Schedule 8 of the *Development Regulations* 2008 ('Development Regulation') outlines the referral and concurrence requirements. Schedule 8, Table 2, Section 11 outlines that activities of major environmental significance require referral to the EPA.

> ***Activities of Major Environmental Significance***
> *Development that involves, or is for the purposes of, an activity specified in Schedule 22 (including, where an activity is only relevant when a threshold level of capacity is reached, development with the capacity or potential to operate above the threshold level, and an alteration or expansion of an existing development (or existing use) where the alteration or expansion will have the effect of producing a total capacity exceeding the relevant threshold level).*

Schedule 22, Part A, Section 2, Subsection 5 identifies **Concrete Batching Works** as being an activity of major environmental significance.

> ***Concrete Batching Works:*** *the conduct of works for the production of concrete or concrete products that are manufactured or are capable of being manufactured by the mixing of cement, sand, rock, aggregate or other similar materials, being works with a total capacity for production of such products exceeding 0.5 cubic metres per production cycle.*

5.1.4 Land Use Definition

Schedule 1 of the Development Regulation specifies land use definitions. The proposed CBP is considered to be a General Industry Use, which is defined as follows:

> ***General industry*** *means any industry other than a service industry, light industry or special industry.*

5.2 Development Plan

5.2.1 Mount Barker District Council Development Plan 2017

The site is located within the Mount Barker District Council local government area and is administered by the *Mount Barker District Council Development Plan 2017* ('Development Plan'). The Development Plan provides a framework for managing and assessing development applications under the Development Act. The Development Plan divides the Council area into zones, sets objectives for development in each zone, and manages development in accordance the implementation criteria formulated, to satisfy the broader objectives.

5.2.2 Zoning

The Development Plan divides the region into various zones based on landscape, key land uses, desired environmental outcomes and strategic planning. The site is located within the Light Industry Zone (refer **Figure 3 – Zone Plan**). The desired character of the Littlehampton Light Industry Zone is as follows:

Function
Dominated by the brickworks and former quarry, the Littlehampton light Industry Zone will provide for industrial uses permitted within the zone which are built in sympathy with adjoining land uses.

Pattern of Development
The zone will preserve existing native vegetation and will retain a landscaped buffer along Hallett Road. The placement of built form and noise generating activities will be sited as far as possible from non-industrial zones and land uses.

Built Form and Character
Development will increase local amenity through landscaping and open space to minimise the over development of allotments, the articulation of built form and the reduction in the outdoor storage of materials visible from public roads, especially where visible from Princes Highway and more specifically land at the intersection of Childs Road and Hallett Road.

The proposed CBP is commensurate with the surrounding land uses (brickworks and other CBP) and will be appropriately screened and operated to ensure potential impacts to surrounding sensitive land uses are minimised. It is therefore considered that the proposed development is consistent with the desired character of the Littlehampton Light Industry Zone.

5.2.3 Level of Assessment

The proposed general industry use is not listed as 'complying development' within Schedule 4 of the Planning Regulation. The proposed general industry use is listed as 'non-complying development' within the Light Industry Zone of the Development Plan.

The proposal has been identified as Category 3 development which is required to be publicly advertised for a period of ten (10) business days.

5.2.4 Assessment Against Relevant Development Plan Provisions

The following Objectives and Principles of Development Control within the Development Plan have been identified as relevant to the proposed development:

Crime prevention

Objectives: 1
Principles of Development Control: 1-3, 5-8

Design and Appearance

Objectives: 1
Principles of Development Control: 1-7, 11, 12, 15, 16, 18-20

Hazards

Objectives: 1, 2, 4
Principles of Development Control: 3-5, 8-10, 13, 26

Heritage Places

Objectives: 1-3
Principles of Development Control: 1, 6, 11

Industrial development

Objectives: 1, 4, 7, 8
Principles of Development Control: 2, 3, 5-14

Infrastructure

Objectives: 5
Principles of Development Control: 1-5, 10, 11,

Interface between land uses

Objectives: 1, 2
Principles of Development Control: 1-3, 6-9, 12, 13

Landscaping, Fences and Walls

Objectives: 1, 2
Principles of Development Control: 1-7

Natural resources

Objectives: 6
Principles of Development Control: 1, 2, 4-6, 8-18, 20-23, 43, 45-49, 56-60

Orderly and sustainable development

Objectives: 3, 4,
Principles of Development Control: 1, 3, 4, 7-9, 12, 13

Siting and visibility

Objectives: 1
Principles of Development Control: 1, 2, 4-6, 8, 9

Transportation and access

Objectives: 2
Principles of Development Control: 2, 8, 16-20, 29-32, 36, 39, 41-48

Waste

Objectives: 1
Principles of Development Control: 1-11, 13, 14, 17-20, 22

A full assessment of the proposed development against the relevant Development Plan provisions has been undertaken (refer **Attachment 8 – Assessment of Development Plan Provisions**).

6 Statement of Effect

Section 17 of the Development Regulation specifies that a consent application for 'non-complying' development must be accompanied by a Statement of Effect to assess the proposal against the relevant provisions of the Development Plan, identify any anticipated social, economic and environmental effects and address any other matters the administering authority may consider to be relevant.

In accordance with Section 17(5) of the Development Regulation, the statement of effect must include the following information:

(a) A description of the nature of the development and the nature of its locality; and
(b) A statement as to the provisions of the Development Plan which are relevant to the assessment of the proposed development; and
(c) An assessment of the extent to which the proposed development complies with the provisions of the Development Plan; and
(d) An assessment of the expected social, economic and environmental effects of the development on its locality; and
(e) Any other information specified by the relevant authority when it resolves to proceed with an assessment of the application (being information which the relevant authority reasonably requires in the circumstances of the particular case).

Items (a) to (e) have been re-stated with a response to each in the section below.

(a) A description of the nature of the development and the nature of its locality.

Response:
Refer to Section 2 (**Site Details**) and Section 3 (**Development Proposal**) above. It is considered that the nature of the proposed CBP is commensurate with the nature of the locality and surrounding industrial uses. On a broader search of the Council zoning, there are limited locations for which a new CBP can be suitably located.

(b) A statement as to the provisions of the Development Plan which are relevant to the assessment of the proposed development.

Response:
Refer to Section 5.2.4 (**Assessment Against Relevant Development Plan Provisions**) above.

(c) An assessment of the extent to which the proposed development complies with the provisions of the Development Plan.

Response:
Refer to **Attachment 8 – Assessment of Development Plan Provisions**. Aside of a minor exceedance of the height provisions, the proposed CBP has been demonstrated as able to comply with the relevant Development Plan Provisions.

(d) An assessment of the expected social, economic and environmental effects of the development on its locality.

Response:
Refer to Section 6.1 (**Social, Environmental and Economic Effects**) below.

(e) Any other information specified by the relevant authority when it resolves to proceed with an assessment of the application (being information which the relevant authority reasonably requires in the circumstances of the particular case.

Response:
Further information requested by the relevant authorities has been provided in this report, to assist with the assessment of the proposed development.

Although the proposed CBP is identified as 'non-complying' development, it has been demonstrated to comply with the relevant provisions of the Development Plan and is not anticipated to result in adverse social, environmental or economic effects.

6.1 Social, Environmental and Economic Effects

As required by Section 17(5)(d) of the Development Regulation, the expected social, environmental and economic effects of the proposed development must be assessed.

6.1.1 Social

The proposed CBP is not anticipated to impact on the social aspect of the locality. The proposed use as a CBP is commensurate with the industrial nature of the area which includes a brickworks operation, fuel depot, sawmill, car wreckers and another CBP. The surrounding land supports industrial land uses and the proposed development will provide an essential construction material to facilitate the rapid growth and associated demand for construction materials.

A combination of landscaping and fencing will be provided along the site frontage to screen views of the CBP from Childs Road. The landscaping will incorporate locally indigenous species to enhance the visual character of the site and enhance the streetscape. The CBP will be screened from the west and south via exiting vegetation and the topography of the site.

Specialist reporting has confirmed that the layout and design of the CBP, along with appropriate on-site operational controls and management measures, will ensure that nearby sensitive receptors are not detrimentally impacted by the proposed development.

6.1.2 Environmental

The site is currently cleared and devoid of any significant vegetation. 10% of the site will be landscaped using locally indigenous species.

The CBP will be operated in accordance with a Stormwater Management Plan, which outlines the design details and operational management procedures which are to be maintained, in order to integrate the required stormwater management practices into the daily operations, so as to minimise the potential for soil and water contamination. Stormwater will be captured, treated and re-used in the batching process to minimise waste and improve operational efficiencies.

Suitable provisions and operational controls will be implemented on site to ensure the proposed CBP satisfies the specific environmental criteria as outlined in the Development Plan.

6.1.3 Economic

The establishment of a CBP on the site will provide a suitable economic use of the land and provide employment and training opportunities for the local area. As mentioned in Section 6.1.1 above, the site is surrounded by other industrial uses and the proposed CBP is commensurate with the pattern and form of the existing land uses in the immediate locality.

The proposed development will provide an essential construction material, to service population growth and support investment in infrastructure and property development within the local area and wider region. In this regard, the development will ensure the continued supply of concrete to this rapidly expanding area of Adelaide. The proposed development will also provide a source of employment to the local community, provide benefits to local businesses and suppliers, as well as contributing towards wider related job opportunities.

The close proximity of the site to the market will ensure the efficient and cost effective supply of concrete. The location of concrete batching plants in proximity to urban areas is necessary to ensure that the integrity of concrete products are not compromised (i.e. the concrete does not begin to set in agitator trucks, during transport and delivery – Australian Standard *AS 1379 - Specification and Supply of Concrete*, clause 4.2.5 allows 90 minutes from the initial mixing of the concrete, until discharge under normal circumstances) and to ensure that the resultant cost of infrastructure and building products are maintained at an affordable level. The location of concrete batching plants in proximity to end users results in competitive pricing, a reduction in travel distance and congestion, and consequently an overall reduction in fuel consumption and greenhouse gas emissions.

7 Conclusion

This report has been prepared to accompany a development application to Council for Development Plan Consent for General Industry (Concrete Batching Plant) at 2 Childs Road, Littlehampton, SA 5251.

The proposed development will promote the efficient supply of an essential construction material, to service population growth and investment in infrastructure and property development within the local area and wider region. The proposed CBP will also provide a source of employment to the local community, provide benefits to local businesses and suppliers, and contribute towards wider related job opportunities:

In summary:

- The proposed CBP can be reasonably be accommodated on the site without causing undue impacts to the existing brickworks operation in the northern portion of the site;
- The construction and operation of the proposed CBP is not anticipated to result in any significant air quality impacts to nearby sensitive receptors;
- The proposed CBP can comply with the noise related provisions of the *Mount Barker District Council Development Plan 2017* and will not have a detrimental effect on the acoustic amenity of nearby sensitive receptors; and
- The proposed CBP has been demonstrated as able to comply with the Objectives and Principles of Development Control within the Development Plan.
- The social, environmental and economic effects of the CBP have been considered and justification provided as to the suitability of the site and locality, as well as demonstrating that the proposal meets the social and environmental obligations expected for such a use.

Having regard to the assessment conducted, it is considered that the proposed development has been demonstrated as consistent with the planning and environmental objectives outlined within the relevant State and Local government planning instruments and policies. Therefore, it is recommended that the proposed development be supported by the relevant authorities, subject to reasonable and relevant conditions.

attachments

Attachment 1

Existing Environmental Protection Authority Permit

South Australia

Licence No. 50250

ISSUED:
02 Mar 2017

EXPIRY:
30 Jun 2021

ACN:
614 735 616

LITTLEHAMPTON CLAY BRICKS AND PAVERS PTY LTD

Allotment 98, Childs Road, LITTLEHAMPTON SA 5250

Environmental Authorisation under Part 6 of the *Environment Protection Act 1993*

South Australian Environment Protection Authority
GPO Box 2607
Adelaide SA 5001
Tel: 08 8204 2004

Environment Protection Authority

LICENCE NUMBER 50250

LICENSEE DETAILS

Licence Holder:	LITTLEHAMPTON CLAY BRICKS AND PAVERS PTY LTD
ACN:	614 735 616
Registered Address:	28 Dequetteville Terrace, KENT TOWN SA 5067
Premises Address(es):	Allotment 98, Childs Road, LITTLEHAMPTON SA 5250

LICENSED ACTIVITIES

The Licensee is authorised to undertake, at the location(s) shown above, the following prescribed activities of environmental significance under Schedule 1 Part A of the Act, subject to the conditions in this Licence.

2(4)	Ceramic works
7(3)(c)	Crushing, grinding or milling works (rock, ores or minerals)
8(2)(a)	Fuel burning not coal or wood

TERMS OF LICENCE

Commencement Date:	02 Mar 2017
Expiry Date:	30 Jun 2021
Amended Date:	06 Jul 2020

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Licence Explanatory Notes – Do Not Form Part of the Licence

Compliance with this licence

The EPA seeks to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment according to the principles of ecologically sustainable development. To achieve this objective, the EPA uses a number of regulatory decision making principles and actions outlined in the 'Compliance and enforcement regulatory options and tools' document available on the EPA website.

Notification – serious or material environmental harm caused or threatened

If serious or material environmental harm from pollution is caused or threatened in the course of an activity, the licence holder must, as soon as reasonably practicable after becoming aware of the harm or threatened harm, notify the EPA (preferably on EPA emergency phone number 1800 100 833) of the harm or threatened harm, its nature, the circumstances in which it occurred and the action taken to deal with it in accordance with section 83 of the *Environment Protection Act 1993* (the Act). In the event that the primary emergency phone number is out of order, the licence holder should phone (08) 8204 2004.

Variations, transfers and surrender of a licence

The EPA may impose or vary the conditions of a licence by notice in writing to the licence holder in accordance with sections 45 and 46 of the Act. Public notice may be required where the variation of licence conditions results in a relaxation of the requirements imposed for the protection or restoration of the environment and results in an adverse effect on any adjoining land or its amenity.

If a licence holder wishes to vary the conditions of a licence, transfer a licence to another entity, or surrender a licence, the licence holder must submit an application to the EPA in accordance with the applicable provisions of the Act (sections 45, 49 and 56, respectively). A licence remains in effect and in its original form until such time as any proposed variation, application for surrender, or transfer has been made and approved in writing by the EPA.

Suspension or cancellation of a licence

The EPA may suspend or cancel a licence by notice in writing to the licence holder in accordance with section 55 of the Act if satisfied the licence holder has either obtained the licence improperly, contravened a requirement under the Act or if the holder is a body corporate, a director of the body corporate has been guilty of misconduct of a prescribed kind (whether in this State or elsewhere).

Responsibilities under Environment Protection legislation

In addition to the conditions of any licence, a licence holder must comply with their obligations under all State and Federal legislation (as amended from time to time) including: the *Environment Protection Act 1993;* the *Environment Protection Regulations 2009;* all Environment Protection Policies made under the *Environment Protection Act 1993;* and any National Environment Protection Measures not operating as an Environment Protection Policy under the *Environment Protection Act 1993*

Public Register Information

The EPA maintains and makes available a Public Register of details related to its determinations and other information it considers appropriate (i.e. excluding trade processes or financial information) in accordance with section 109 of the Act. These details include, but are not limited to:

- licensing and beverage container applications and approvals
- enforcement actions
- site contamination
- serious or material environmental harm caused or threatened in the course of an activity
- environment improvement programmes and environment performance agreements
- environment assessment reports; results of testing, monitoring or evaluation required by a licence
- EPA advice or direction regarding development approvals referred to the EPA by a planning authority

Definitions

Unless the contrary intention appears, terms used in this licence that are defined in the Act (including any regulations or environment protection policies made pursuant to the Act) have the respective meanings assigned to those terms by the Act.

THE ACT: The *Environment Protection Act 1993*

PREMISES: The whole of the land comprised in Titles Register - Certificate of Title, Crown Lease and Crown Record.

CT5792/221

AUTHORISATION FEE PAYMENT DATE: means the anniversary of the grant or renewal of this authorisation.

AUTHORISED OFFICER: means a person appointed to be an authorised officer pursuant to Part 10 Division 1 Section 85 of the Act.

DRAG OUT: means when pollutants, including but not limited to sediment, soils, mud, clay, silt or sand, is deposited by vehicles exiting the licensed site on to public roads, verges, footways or footpaths.

ENVIRONMENTAL HARM: means the same as is defined in section 5 of the Environment Protection Act 1993.

POLLUTION CONTROL EQUIPMENT: means 'control equipment' as defined in the Environment Protection (Air Quality) Policy: any device that controls, limits, measures, records or indicates air pollution.

SILT RETENTION DEVICE: means a basin, dam or trap that is designed to minimise suspended material entering waterways.

STORMWATER: is as defined in the Environment Protection (Water Quality) Policy 2015.

WASTE: means -

1. As defined under the Environment Protection Act 1993,

1(a) any discarded, dumped, rejected, abandoned, unwanted or surplus matter, whether or not intended for sale or for purification or resource recovery by a separate operation from that which produced the matter; or

1(b) any matter declared by regulation to be waste for the purposes of this Act (following consultation by the Minister on the regulation with prescribed bodies in accordance with the regulations); or

1(c) any matter declared by an environment protection policy to be waste for the purposes of this Act,

whether or not of value.

2. However, waste does not include—

2(a) an approved recovered resource whilst it is being dealt with in accordance with the declaration of that resource—see section 4A; or

2(b) anything declared by regulation or an environment protection policy not to be waste for the purposes of this Act,

even though the resource or the thing so declared might otherwise, but for the declaration, fall within the definition of waste in subsection (1).

Acronyms

EPA: means Environment Protection Authority

NATA: means National Association of Testing Authorities.

STP: means standard temperature and pressure (zero degrees Celsius and 101.3 kiloPascals absolute).

Conditions of Licence

The Licensee is authorised to conduct the prescribed activities as described in this Licence at the Premises nominated, subject to the following conditions:

1 CONTROL OF EMISSIONS

1.1 BRICK KILN SMOKE AND ODOUR EMISSIONS (33 - 1)

The Licensee must:

1.1.1 fire the brick kiln on virgin light fuel oil until the temperature at the top of the kiln is greater than 240 degrees Celsius; and

1.1.2 ensure that smoke emitted from the chimney of the brick kiln does not exceed Ringelmann 2 or the equivalent reading on the Opacity Meter.

1.2 DRAG OUT MINIMISATION (S - 239)

The Licensee:

1.2.1 must take all reasonable and practicable measures to prevent drag out from leaving the Premises.

1.3 DUST PREVENTION (S - 7)

The Licensee must take all reasonable and practicable measures to prevent dust from leaving the Premises.

1.4 MINIMISATION OF STORMWATER CONTAMINATION (S - 77)

The Licensee must take appropriate measures, including use of an effective silt retention device, to minimise the contamination of stormwater by suspended material.

1.5 NOISE PREVENTION (S - 136)

The Licensee must take all reasonable and practicable measures to prevent noise from leaving the Premises.

2 OPERATIONAL MANAGEMENT

2.1 BRICK KILN WASTE OIL FUEL (33 - 6)

The Licensee must ensure that the brick kiln oil fuel complies with the following specifications:

2.1.1 water content must not exceed 6%; and

2.1.2 sulphur content must not exceed 1.5%.

2.2 BUNDING (S - 5)

The licensee must ensure that all chemicals or chemical products are stored, loaded or unloaded in an appropriately bunded area.

NOTES

The EPA will assess the appropriateness of any bund against the EPA's 'Bunding and Spill Management Guidelines'.

2.3 COMPLAINTS REGISTER (S - 1)

The Licensee must:

2.3.1 prepare and maintain a register of all complaints concerning environmental issues.

2.3.2 ensure the register includes:

a the date and time that the complaint was made;

b details of the complaint including the likely cause of events giving rise to the complaint;

c the contact details of the complainant (if permitted by the complainant); and

d details of any action taken in response to the complaint by the Licensee.

2.4 POLLUTION CONTROL EQUIPMENT REGISTER (S - 2)

The Licensee must:

2.4.1 maintain all Pollution Control Equipment to ensure that pollution is minimised; and

2.4.2 keep a written record of all inspections of Pollution Control Equipment, which includes:

a the name of the recording officer;

b the date of each inspection of the equipment;

c details of the equipment that was inspected;

d an assessment of whether the equipment was working effectively; and

e the action taken (if required) to rectify any faults or failures.

3 MONITORING AND REPORTING

3.1 BRICK KILN WASTE OIL FUEL ANALYSIS (33 - 7)

BRICK KILN WASTE OIL FUEL ANALYSIS

3.1.1 The Licensee must conduct an analysis of oil fuel used at the Premises once every two weeks in a NATA approved laboratory to determine:

a water content in accordance with ASTM D95 distillation test procedure; and

b sulphur content in accordance with ASTM D129 (modified) test procedure.

3.1.2 The Licensee must keep the certified test results on the Premises and available at all times to Authorised Officers.

3.2 TESTING BRICK KILN EXHAUST GASES (33 - 15)

BRICK KILN EXHAUST GAS TESTING

3.2.1 The Licensee must ensure that the brick kiln exhaust gases are tested by a laboratory accredited by NATA to undertake that testing for:

a total fluorides expressed in milligrams per cubic metre at STP, dry basis of hydrogen fluoride;

b chlorides expressed in milligrams per cubic metre at STP, dry basis of chlorine;

c sulphur dioxide in milligrams per cubic metre at STP, dry basis;

d sulphur trioxide and sulphuric acid mist expressed in milligrams per cubic metre at STP, dry basis of sulphur trioxide;

e total solid particles in milligrams per cubic metre at STP, dry basis;

f lead and lead compounds in milligrams per cubic metre at STP, dry basis;

g stack gas flow rate in cubic metres per hour at STP, dry basis and stack gas temperature in degrees Celsius, measured concurrently;

h kiln discharge velocity in metres per second;

i kiln temperature during test in degrees Celsius;

j mass of bricks in kiln during test [total number of bricks and average weight per brick (green and fired)]; and

k type of brick, fluoride and chloride content in percentage weight per weight (green and fired), if available.

3.2.2 The Licensee must ensure that the testing is:

a conducted on the kiln exhaust chimney while only one ducted kiln is on-line.

b conducted at a point upstream of the kiln drafting fan prior to any admixture of air or other gases

c undertaken at each of the following kiln/process conditions:

i kiln cycle in the range 300 to 500 degrees Celsius; and

ii kiln cycle in the range of 850 degrees Celsius to high fire maximum temperature.

d undertaken at one yearly intervals.

3.2.3 The Licensee must submit the results of brick kiln exhaust tests to the Authority within 28 days after completion of test sampling.

4 ADMINISTRATION

4.1 ANNUAL RETURN AND PAYMENT OF ANNUAL FEES (A - 4)

For the purposes of section 48(2)(a) of the Act, the date in each year for the lodgement of the Annual Return is no later than 90 days before the anniversary of the grant or renewal of the Licence; and

4.1.1 For the purposes of section 48(2)(b) of the Act, the date in each year for the payment of Annual Authorisation Fee is the anniversary of the grant of the Licence.

4.2 APPROVAL OF OPERATING PROCESSES (A - 6)

The Licensee must not undertake changes to operating processes conducted pursuant to the Licence at the Premises without written approval from the EPA, where such changes:

4.2.1 have the potential to increase emissions or alter the nature of pollutants or waste currently generated by, or from the licensed activity; or

4.2.2 have the potential to increase the risk of environmental harm; or

4.2.3 would relocate the point of discharge of pollution or waste at the Premises.

4.3 APPROVAL OF WORKS (A - 5)

The Licensee must not construct or alter a building or structure, or install or alter any plant or equipment, for use of an activity undertaken pursuant to the Licence at the Premises without written approval from the EPA, where such changes:

4.3.1 have the potential to increase the emissions or alter the nature of pollutants or waste currently generated by, or from the licensed activity; or

4.3.2 have the potential to increase the risk of environmental harm; or

4.3.3 would relocate the point of discharge of pollution or waste at the Premises.

4.4 CHANGE OF LICENSEE DETAILS (A - 3)

If the Licensee's name or postal address (or both) changes, the Licensee must inform the EPA within 28 days of the change occurring.

4.5 LICENCE RENEWAL (A - 2)

For the purposes of section 43(3) of the Act, an application for Renewal of the Licence must be made no later than 90 days before the expiry date of the Licence.

4.6 OBLIGATIONS TO EMPLOYEES, AGENTS AND CONTRACTORS (A - 1)

The Licensee must ensure that every employee, agent or contractor responsible for undertaking any activity regulated by the Licence, is informed as to the conditions of the Licence.

Attachments

There are no documents attached to this licence.

Attachment 2

Title Search

LAND SERVICES SA

Product	Title Details
Date/Time	24/12/2020 02:24 PM
Customer Reference	245201A1 210
Order ID	20201224006455

Certificate of Title

Title Reference	CT 5792/221
Status	CURRENT
Easement	NO
Owner Number	71189947
Address for Notices	UNIT 1, 2 CHILDS RD LITTLEHAMPTON, SA 5250
Area	3.26HA (APPROXIMATE)

Estate Type

FEE SIMPLE

Registered Proprietor

2 CHILDS ROAD PTY. LTD. (ACN: 641 739 764)
OF UNIT 1 2 CHILDS ROAD LITTLEHAMPTON SA 5250

Description of Land

ALLOTMENT 98 FILED PLAN 160275
IN THE AREA NAMED LITTLEHAMPTON
HUNDRED OF MACCLESFIELD

Last Sale Details

Dealing Reference	TRANSFER (T) 13323679
Dealing Date	25/06/2020
Sale Price	$0
Sale Type	NO MONETARY CONSIDERATION

Constraints

Encumbrances

Dealing Type	Dealing Number	Beneficiary
MORTGAGE	10543053	NATIONAL AUSTRALIA BANK LTD.
MORTGAGE	10619940	NATIONAL AUSTRALIA BANK LTD.

Stoppers

NIL

Valuation Numbers

Valuation Number	Status	Property Location Address
5810784006	CURRENT	2 CHILDS ROAD, LITTLEHAMPTON, SA 5250

Notations

Dealings Affecting Title

LAND SERVICES SA

Product	Title Details
Date/Time	24/11/2020 04:37:07
Customer Reference	2452/DA1.210
Order ID	20201124006455

NIL

Notations on Plan

NIL

Registrar-General's Notes

CONTROLLED ACCESS ROAD VIDE PLAN 57
PLAN FOR LEASE PURPOSES VIDE G142/2005

Administrative Interests

NIL

Attachment 4

Air Quality Impact Assessment

Holcim Littlehampton
Holcim Australia Pty Ltd
01-Feb-2021

AECOM Imagine it. Delivered.

Holcim Littlehampton Concrete Batching Plant

Air Quality Impact Assessment

Holcim Littlehampton Concrete Batching Plant

Air Quality Impact Assessment

Client: Holcim Australia Pty Ltd

ABN: 87 099 732 297

Prepared by

AECOM Australia Pty Ltd
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T +61 8 7223 5400 F +61 8 7223 5499 www.aecom.com
ABN 20 093 846 925

01-Feb-2021

Job No.: 60650165

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

Quality Information

Document	Holcim Littlehampton Concrete Batching Plant
Ref	60650165
Date	01-Feb-2021
Prepared by	Julian Ward
Reviewed by	Kristen Clarke

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	27-Jan-2021	Draft	Kylie Schmidt Technical Director, CI	
1	01-Feb-2021	Final	Kylie Schmidt Technical Director, CI	

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1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by Holcim Australia Pty Ltd (Holcim) to prepare an Air Quality Impact Assessment (AQIA) for the construction and operation of a proposed concrete batching plant (the Proposed Development) on Childs Road, Littlehampton, South Australia. The concrete batching plant (CBP) is planned to service projects in the Adelaide Hills area.

This report identifies the current regulatory system relevant to air quality management, describes baseline air quality and meteorological conditions in the Proposed Development area, and provides an assessment of potential air quality impacts associated with the construction and operation of the Proposed Development. Air quality mitigation measures and strategies were then recommended for the Proposed Development where required based on the findings of the assessment.

1.2 Purpose of this Report

The purpose of this report is to support the development application for the Proposed Development and provide information for the South Australian regulatory authorities to review in relation to the development application.

1.3 Assessment Methodology

The methodology for the assessment of potential air quality impacts from activities associated with construction and operation of the Proposed Development included the following key elements:

- Description of the Proposed Development in terms of spatial layout, material handling and product processes, and timing;
- Identification of potential sources of air emissions;
- Identification of pollutants of interest;
- Identification of air quality legislation relevant to the Proposed Development;
- Description of the existing environment in the Proposed Development area including; local climate meteorology and existing air quality; as well as identification of nearby sensitive receptors
- Description of the assessment methodology; including
  - Assessment of construction impacts using the UK Institute of Air Quality Management (IAQM), 2014 *Guidance on the assessment of dust from demolition and construction*.
  - Modelling Methodology undertaken in accordance with the Environmental Protection Authority, Ambient Air Quality Assessment (EPA 2016) using the dispersion model CALPUFF.
- Assessment of air quality impacts from construction and operation
- Discussion, recommendation of mitigation measures and conclusion

2.0 Project Overview

2.1 Location

The Proposed Development is located just north of the South Eastern Freeway on Childs Road in Littlehampton, South Australia. The location of the Proposed Development site is presented in **Figure 1**. The Proposed Development is located within an area of existing industrial land uses with a brickworks adjacent to the north and another concrete batching pant to the northeast. Nearby residential areas are located approximately 220m to the north on Hallett Road and 140 m to the south of the Proposed Development on the southern side of the South Eastern Freeway.

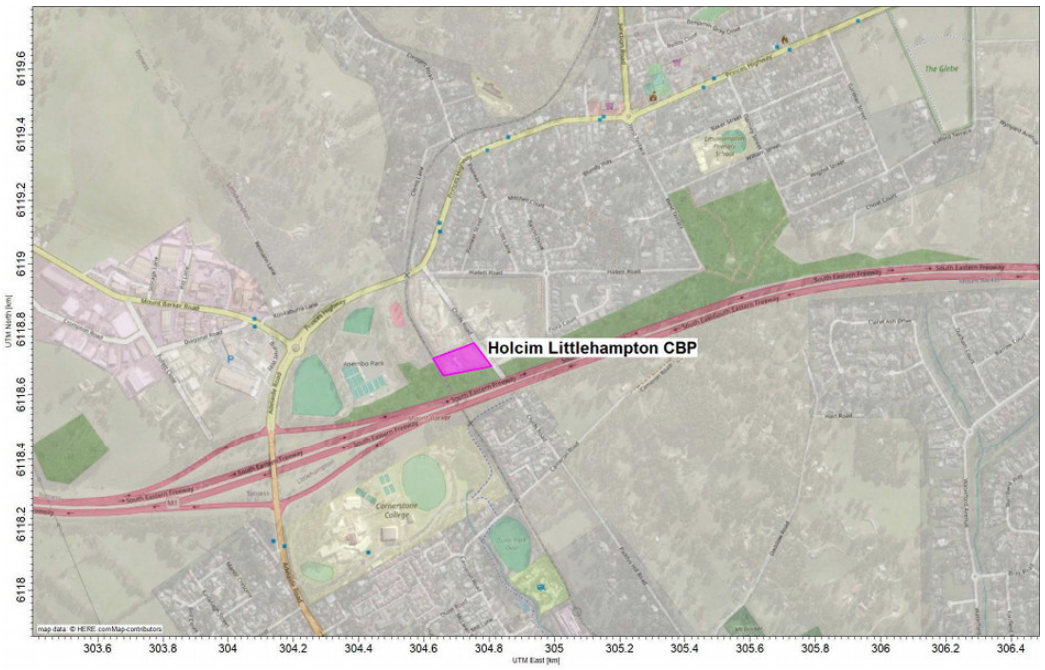

Figure 1 Location of Holcim Littlehampton CBP

2.2 Proposed Batching Methodology and Operational Times

The Proposed Development would operate as a dry batch process whereby dry materials (cement, sand and aggregate, water and admixtures) would be loaded directly into truck-mounted mixers.

Sand and aggregate would be transported to the site in heavy vehicles (truck and dog). The aggregate materials are then weighed via weigh hopers, located directly beneath the material holding hoppers. A front-end loader would transfer the sand and aggregate to holding hoppers in the upper level of the site (see plant layout in **Section 2.3**).

The cement, fly ash and other cementitious materials will be delivered in tankers and pneumatically blown into the silos. The cementitious material will be held in silos and then discharged via weigh hoppers, directly into the truck mixers.

The Proposed Development will operate almost exclusively between the hours of 5 am to 5 pm weekdays and 5 am to 12 noon Saturdays. However, the plant will be available for 24-hour operation should the need arise for out of hours production. For the purpose of this assessment, annualised emission rates were estimated based on 12-hour days. Pollutant concentrations for longer averaging periods (24-hours and annual) were applied to the model for the hours of 5 am to 5 pm for all days in the model. Concentrations for 1-hour averaging periods were applied 24 hours a day in the model. This is discussed further in **Section 5.2.3**.

2.3 Plant Layout

The plant would be set out on two levels, separated by a 5 m elevation difference. The delivery and storage of raw materials would occur on the upper level, and the weigh hopper and truck loading facilities would be located on the lower level. Agitator trucks would access the lower level only. A layout of the proposed plant is presented in **Figure 2** – the upper level is on the right hand side of the figure.

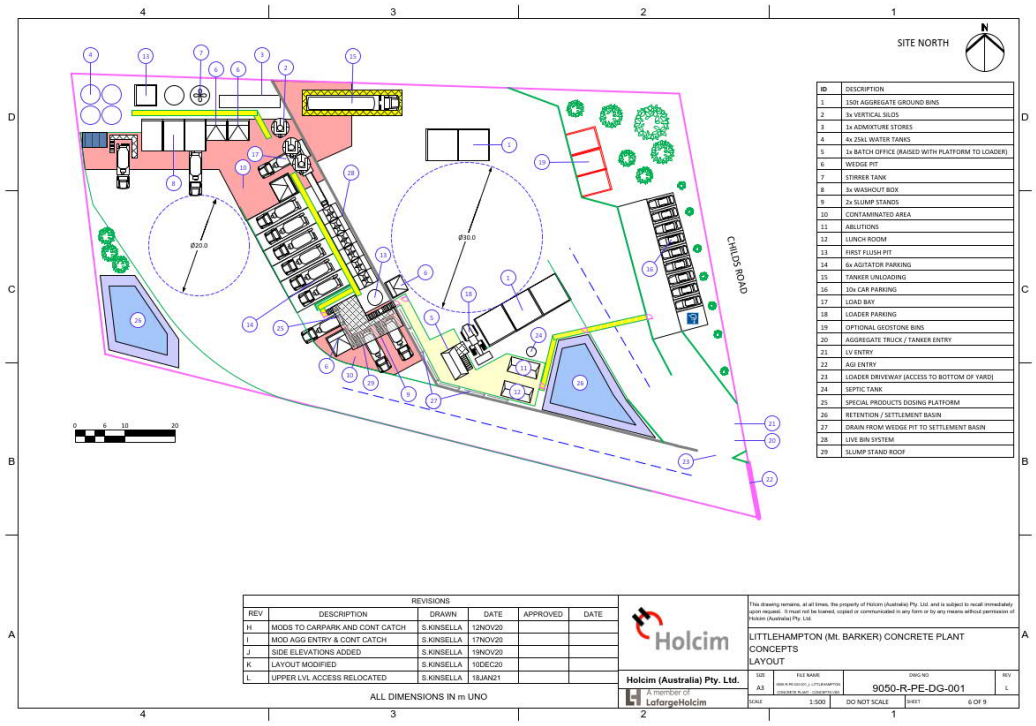

Figure 2 Proposed plant layout – source Holcim 2021

2.4 Project Air Emissions

Pollutant emissions due to the Proposed Development would be primarily from the movement and disturbance of dusty materials during both construction and operation. Combustion engine emissions would also present a source of air pollution. The following activities were identified as potential pollution sources:

- Construction:
  - Minor earthworks involved in the construction of the Proposed Development
  - Truck and vehicle wheel dust on unsealed surfaces
  - Handling of construction materials
  - Vehicle exhaust emissions
- Operation:
  - Delivery of raw materials (aggregate/ sand/ cement)
  - Unloading and transfer of raw materials including weigh hopper
  - Loading trucks with product

- Truck and vehicle wheel dust on unsealed surfaces
- Wind erosion from raw material bins

2.5 Pollutants of Interest

2.5.1 Particulate Matter

Particulate matter refers to the many types and sizes of particles suspended in the air we breathe. Particulate matter is often classified according to the following size fractions:

- Total suspended particulates (TSP)
- Particles with an aerodynamic diameter less than or equal to ten micrometres (µm) (known as PM_{10});
- Particles with an aerodynamic diameter less than or equal to 2.5 µm (known as $PM_{2.5}$);
- Deposited dust, typically > 50 µm

Particulate matter refers to the many types and sizes of particles suspended in the air we breathe. Particles with an aerodynamic diameter of less than or equal to 50 µm are collectively referred to as TSP. TSP primarily causes aesthetic impacts associated with coarse particles settling on surfaces, which also causes soiling and discolouration. These large particles can cause some irritation of mucosal membranes and can increase health risks from ingestion if contaminated. PM_{10} and $PM_{2.5}$ tend to remain suspended in the air for longer periods than larger particles and can penetrate human lungs.

Particulate matter is unique among atmospheric pollutants in that it is not defined on the basis of its chemical composition; it includes a broad range of chemical species. Particulate matter can be emitted from natural sources (bushfires, dust storms and pollens) or as a result of human activities such as combustion activities (motor vehicle emissions, power generation and incineration), excavation works, bulk material handling, crushing operations, unpaved roads and use of wood heaters. For the Proposed Development, particulate matter will be emitted from a number of activities including disturbance of raw materials as they are delivered or loaded, traffic on haul roads, and loading of agitator trucks.

2.5.2 Nitrogen dioxide

Nitrogen dioxide (NO_2) is a brownish gas with a pungent odour. It exists in the atmosphere in equilibrium with nitric oxide. The mixture of these two gases is commonly referred to as nitrogen oxides (NOx). Nitrogen oxides are a product of combustion processes. In urban areas, motor vehicles and industrial combustion processes are the major sources of ambient nitrogen oxides.

2.5.3 Carbon monoxide

Carbon monoxide (CO) is a colourless, odourless gas produced by the incomplete combustion of fuels containing carbon (e.g. oil, gas, coal and wood).

3.0 Relevant Legislation

3.1 National Environment Protection (Ambient Air Quality) Measure

The *National Environment Protection (Ambient Air Quality) Measure* (AAQ NEPM) was formed in 1998 under the *National Environment Protection Council Act 1994* (NEPC Act). It was designed to create a nationally consistent framework for monitoring and reporting on common ambient air pollutants. For the purpose of the operational assessment, pollutants of interest are carbon monoxide (CO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

3.2 South Australian Environment Protection Act 1993

The South Australia *Environment Protection Act 1993* (EP Act) provides the legislative framework for environmental management and protection in South Australia. The objective of the act is to promote the principles of ecologically sustainable development and to ensure that land development is managed in a way that protects or enhances the natural environment.

The EP Act gives regulatory powers to make environmental protection policies to enhance or protect South Australia's environment. The most recent *Environment Protection (Air Quality) Policy* was gazetted in 2016.

3.3 South Australian Environment Protection (Air Quality) Policy 2016

The South Australian *Environment Protection (Air Quality) Policy 2016* (EPP Air) was prepared under Section 28 of the EP Act and provides maximum ground level concentrations for a range of air pollutants. The air quality objectives and guidelines listed below were sourced from the EPP Air and were adopted as the air quality objectives for the Proposed Development. Only the pollutants of interest to the Proposed Development, as discussed in **Section 2.5**, have been included There is no annual average criterion for PM_{10} in the EPP Air, and this has therefore been taken from the AAQ NEPM.

Table 1 Adopted Project Air Quality Objectives

Indicator	Project Objective	Averaging Period	Environmental Value
PM_{10}	50 µg/m³ [1] 25 µg/m³	24-hour Annual[2]	Toxicity
$PM_{2.5}$	25 µg/m³ 8 µg/m³	24-hour Annual	Toxicity
NO_2	250 µg/m³ 60 µg/m³*	1-hour Annual	Toxicity
CO	31,240 µg/m³ 11,250 µg/m³	1-hour 8-hour	Toxicity

Table notes:

1. µg/m³ micrograms per cubic metre
2. AAQ NEPM annual average PM_{10} criteria

4.0 Existing Environment

4.1 Sensitive Receptors

Sensitive use (sensitive receptors) are defined in the EP Act as:

a. Use for residential purposes; or

b. Use for pre-school withing the meaning of the Development Regulations 1993: or

c. Use for a primary school; or

d. Use of a kind prescribed by regulation

A selection of nearby residences and recreational facilities were identified in the area surrounding the Proposed Development for inclusion in the modelling, and are presented in **Figure 3**.

Figure 3 Location of nearby sensitive receptors

4.2 Climate and Meteorology

Meteorology in the Littlehampton area is affected by several factors such as terrain and land use. Wind speed and direction are affected by topography at the small scale, while factors such as synoptic scale winds affect wind speed and direction on the larger scale. The primary land uses surrounding the Proposed Development are medium industrial, urban park land and residential. These land use have a relatively high surface roughness (compared with farmland for example) and would not allow winds to blow relatively unimpeded across the land. This can have a positive effect on pollutant dispersion as there are many obstacles such as buildings and stands of tall trees to drive mechanical dispersion.

Wind speed and direction are important variables in assessing potential air quality impacts from the Proposed Development, as they dictate the direction and distance pollutants travel.

The nearest BoM meteorological station to the Proposed Development is at Mt Lofty, 16 km to the northwest. However, the Mt Lofty station is located on the summit of Mt Lofty at an elevation of around 700m and is not representative of the Proposed Development site. The Kuitpo BoM station is slightly

further (21 km to the southwest) but is at a similar elevation to the Proposed Development site and is likely more representative of conditions at the Proposed Development site. Long term data for temperature, rainfall, relative humidity and mean wind speed were sourced from the BoM Kuitpo station to provide an indication of the regional climate of the Proposed Development area.

Average monthly temperature and rainfall are presented in **Figure 4**. Minimum temperatures in summer are between about 13 ˚C and 14 ˚C with maximum temperatures of around to 24 ˚C to 26 ˚C. Minimum temperatures in winter are around 4 ˚C with maximum temperatures between 12 and 13 ˚C . Rainfall is most prevalent in the cooler months in the Adelaide Hills with up to around 100 mm of rain falling in June and July. Less than 40 mm of rain falls each month between November and March.

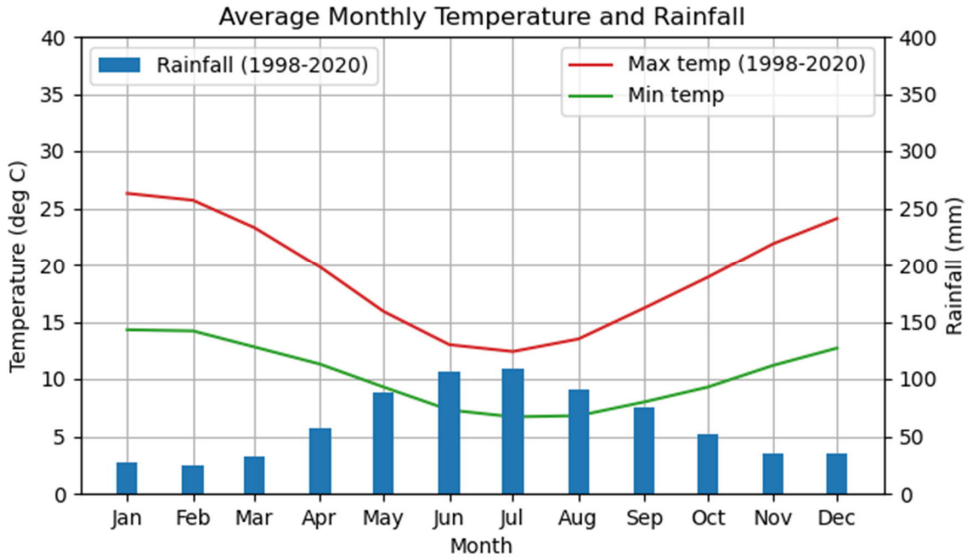

Figure 4 Average monthly temperature and rainfall at BoM Kuitpo

Annual and seasonal wind roses for data collected between 2011 and 2019 at the BoM Kuitpo station are presented in **Figure 5**.

The annual wind rose shows winds mostly from the southwest, west, northwest and southeast. The average wind speed is about 4.3 m/s (meters per second) (about 15 km/hr). Calm conditions (winds less than 0.5 m/s occur around 1 % of the time.

Very frequent southeast winds dominate summer at Kuitpo with less frequent easterly and westerly winds also occurring. Winter is dominated by northwest winds with west and southwest winds also quite common. Autumn and Spring are transition seasons between the opposing summer and winter wind patterns with a mix of the southeast and northwest winds.

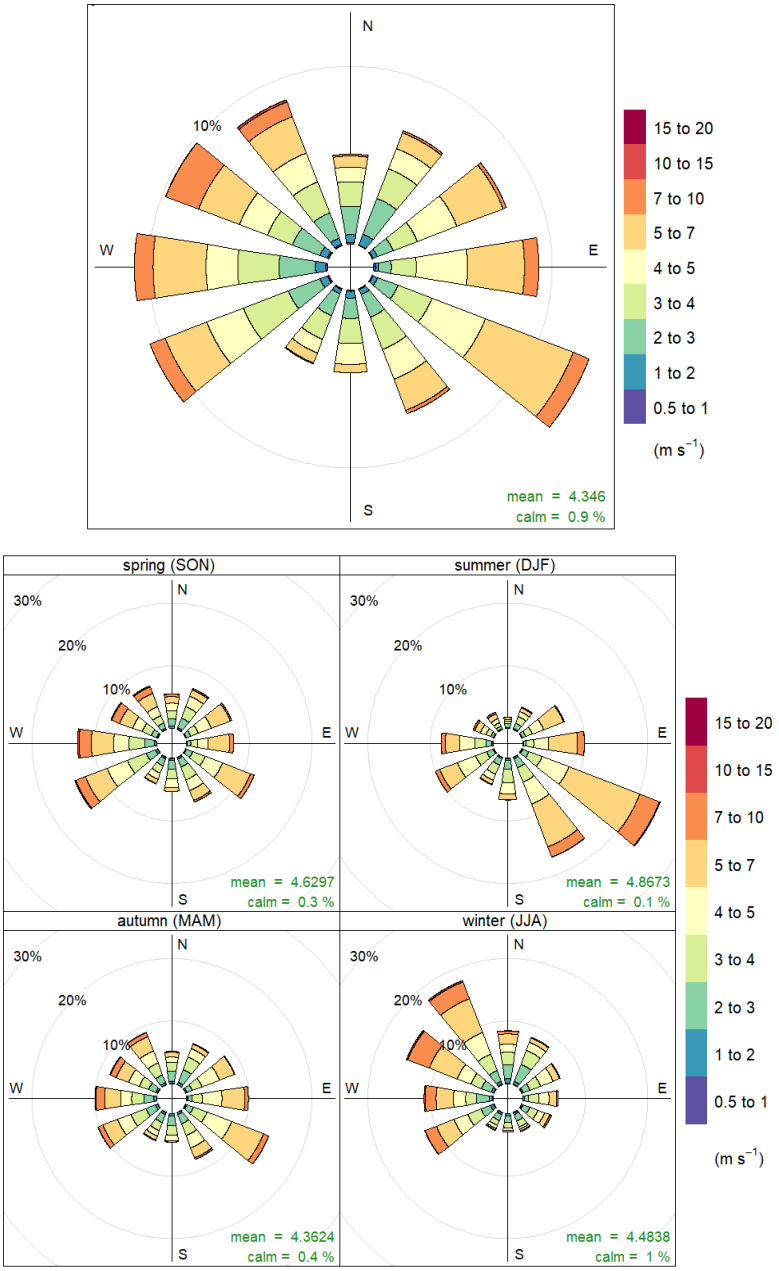

Figure 5 Annual (top) and seasonal (bottom) wind roses at BoM Kuitpo – 2011 to 2019 data

Wind roses for the modelled meteorological data are presented in **Appendix A**. The 2017 data set generated by CALMET was shown to correlate well with observed BoM data is was considered suitable for use in this assessment.

4.3 Terrain

Modelled terrain in the area immediately surrounding the Proposed Development is presented in **Figure 6**. The Proposed Development site is located in a valley running north-south at an elevation of

approximately 340 m. Mild valley drainage effects (cool air flowing down the axis of the valley – in this case from north to south) may occur at the Proposed Development site on still nights or mornings. A range of hills to the west rises to about 460 m. These hills are likely to only exert minor effects on winds in the area.

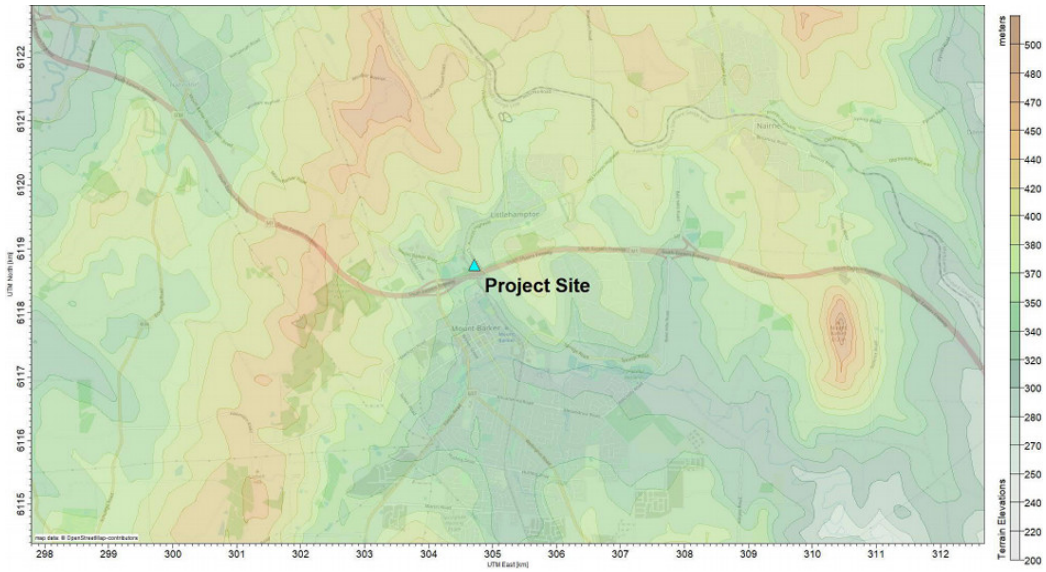

Figure 6 Terrain surrounding the Proposed Development (as used in the dispersion model)

4.4 Existing Air Quality

4.4.1 Existing Air Emission Sources

It is important to identify existing sources of air emissions within the study area that may contribute to background air pollutant concentrations; particularly in the absence of nearby ambient air quality monitoring data as further discussed in Section 4.4.2. There are three existing sources of air pollution immediately adjacent the proposed project site; a brickworks to the north, a concrete batching plant to the northeast, and the South Eastern Freeway to the south. The location of the three sources in relation to the Proposed Development are presented in **Figure 7**.

The brickworks is operated by Littlehampton Brick Company and is listed on the National Pollutant Inventory (NPI). The primary pollutants from the brickworks are fluoride, sulfur dioxide, oxides of nitrogen and particulate matter. A search of the NPI website showed that the brickworks had total PM_{10} emissions 6,100 kg in the 2018/19 reporting year, of which 66 % was emitted from point source stacks[1]. Nitrogen dioxide and $PM_{2.5}$ emissions were 4,400 kg (75 % point source) and 2,100 kg (95 % point source) respectively for the same year. Emissions from point sources tend to disperse much more rapidly than ground-based sources. Due to a high percentage of emissions from the stacks and only a small amount from ground-based sources, pollutant concentrations at nearby receptors due to operation of the brickworks are not expected to be elevated. Conservatively estimated baseline concentrations (discussed in **Section 4.4.3**) can account for any impacts the brickworks has on existing pollutant concentrations in the Proposed Development area. The brickworks was therefore not included as a cumulative source in the modelling.

The existing concrete batching plant (the existing CBP) to the north east of the site is operated by a different entity and therefore specific information about the site is unknown. The existing CBP is not listed on NPI and emission rates are therefore unknown. However, the plant is known to operate using a similar single-mode point (truck loading station) to the Proposed Development and the throughput is

[1] http://www.npi.gov.au/npidata/action/load/emission-by-individual-facility-result/criteria/state/SA/year/2019/jurisdiction-facility/SA0154 Accessed on 13 January 2021

likely to be similar. Emission sources would be very similar to those at the Proposed Development due to handling of the same type of materials using similar plant (front end loaders etc.) at similar heights above ground level. The existing CBP was included as a source in the model to account for potential cumulative impacts.

Emission from the South Eastern Freeway are primarily due to combustion engine exhaust from traffic using the freeway. Particulate matter, nitrogen dioxide and carbon dioxide are primary pollutants from road traffic and would therefore potentially result in cumulative impacts with sources from the Proposed Development. The section of the South Eastern Freeway alongside the Proposed Development had about 17,900 vehicles daily[2] in 2018. This is relatively minor in terms of a major arterial road in Australia and emissions are unlikely to be greater than those experienced in urban Adelaide, where traffic numbers can be much higher. Based on this, the cumulative effect of the freeway is considered to be covered by the estimated background concentrations presented in **Section 4.4.3.**

Figure 7 Adjacent existing pollution sources

4.4.2 Estimated Baseline Pollutant Concentrations

The SA EPA operates monitoring stations at a range of locations around the Adelaide region, though there are no stations in the Adelaide Hills. Background pollutant concentrations were therefore estimated for the Littlehampton area based on those measured in Adelaide. Given the differences in land use between Adelaide and Littlehampton, there are likely some differences in the existing pollutant concentrations. However, Adelaide would generally have higher pollutant levels than

[2] https://location.sa.gov.au/viewer/?map=hybrid&uids=138 accessed 22 January 2021

Littlehampton due to a larger number of sources (traffic and industry). The concentrations estimated from Adelaide are therefore likely to be conservative for the Proposed Development area.

Data has been obtained from the Northfield, Le Fevre 1, Le Fevre 2, Adelaide CBD and Netley monitoring stations. Each station has data limitations and therefore background pollutant data was sourced from a number of stations which are not necessarily the closest to the Proposed Development area. Points of note regarding the monitoring stations are as follows:

- PM_{10} and $PM_{2.5}$ data was available from all stations with the exception of Northfield.
- Limited CO data was available across the 5 stations (only available at Le Fevre 1 for part of 2018).
- NO_2 data was available from all stations with the exception of Le Fevre 1.

Background pollutant concentration summaries for NO_2, PM_{10}, $PM_{2.5}$ and CO recorded at Northfield, Le Fevre 1, Le Fevre 2, Adelaide CBD and Netley between 2015 and 2018 are shown in **Table 2** to **Table 5**. Concentrations were well below the criteria for NO_2 at all stations except Adelaide CBD. It should be noted that the concentrations recorded at the Adelaide CBD site for NO_2 are not considered reliable due to the location of the station. This caution has been expressed by SA EPA and as such, the background concentrations from Adelaide CBD have not been used for the assessment

Maximum PM_{10} concentrations have exceeded the 24-hour criteria of 50 $\mu g/m^3$ at all stations in most years presented here. These elevated PM_{10} concentrations are often due to bushfire smoke or dust events which typically affect the whole Adelaide region. Infrequent elevated 24-hour average PM_{10} concentrations are also expected in the Proposed Development area should bushfires or dust storms occur in the region.

Maximum $PM_{2.5}$ concentrations have been below the criteria of 25 $\mu g/m^3$ at all stations for all years except in 2017 at Le Fevre 1, where a small exceedance of the criteria was measured. Similarly to PM_{10}, $PM_{2.5}$ concentrations can be adversely affected by regional events such as bushfires and dust events. Rare elevated 24-hour average $PM_{2.5}$ concentrations may also be expected at the Proposed Development site during times of bushfires or regional raised dust events.

CO concentrations have only been measured at Lefevre 1 and the highest concentrations are well below the relevant criteria.

Table 2 Measured background air pollutant concentrations, NO_2

Year	NO_2 Monitoring Data Summary, 2015 – 2018 ($\mu g/m^3$)				
	Averaging Time	2015	2016	2017	2018
Netley	1 hour 70th pctl	18.5	16.4	20.5	14.4
	1 hour Maximum	96.4	80.0	82.0	77.9
	Annual	15.2	14.3	15.9	13.4
Le Fevre 2	1 hour 70th pctl	14.4	10.3	14.4	12.3
	1 hour Maximum	73.8	69.7	77.9	69.7
	Annual	11.4	8.7	12.3	10.5
Adelaide CBD	1 hour 70th pctl	55.4	51.3	45.1	47.2
	1 hour Maximum	422.3	471.5	551.5	440.8
	Annual	44.4	41.4	38.8	39.5
Northfield	1 hour 70th pctl	16.4	14.4	14.4	14.4
	1 hour Maximum	75.9	80.0	77.9	65.6
	Annual	15.2	12.5	14.0	12.7

Table 3 Measured background air pollutant concentrations, PM_{10}

Year	PM_{10} Monitoring Data Summary, 2015 – 2018 (µg/m³)				
	Averaging Time	2015	2016	2017	2018
Netley	24 hour 70th pctl	18.0	17.9	17.3	28.0
	24 hour Maximum	95.7	35.4	37.1	77.5
	Annual	15.7	15.1	15.0	25.4
Le Fevre 1	24 hour 70th pctl	20.3	23.0	25.0	24.0
	24 hour Maximum	85.4	58.6	68.8	69.3
	Annual	18.1	21.1	23.5	22.4
Le Fevre 2	24 hour 70th pctl	22.0	21.8	21.8	24.0
	24 hour Maximum	114.2	80.6	57.2	60.9
	Annual	19.1	18.5	19.6	21.3
Adelaide CBD	24 hour 70th pctl	20.2	19.2	20.4	20.3
	24 hour Maximum	68.2	53.9	36.2	56.3
	Annual	17.0	15.5	17.0	17.3

Table 4 Measured background air pollutant concentrations, $PM_{2.5}$

Year	$PM_{2.5}$ Monitoring Data Summary, 2015 – 2018 (µg/m³)				
	Averaging Time	2015	2016	2017	2018
Netley	24 hour 70th pctl	8.4	10.0	10.0	8.0
	24 hour Maximum	19.2	19.7	22.4	18.1
	Annual	7.3	9.0	8.8	7.2
Le Fevre 1	24 hour 70th pctl	ND	9.0	9.0	8.0
	24 hour Maximum	ND	19.4	26.3	20.9
	Annual	ND	7.6	8.4	6.7
Le Fevre 2	24 hour 70th pctl	8.5	7.2	7.4	8.1
	24 hour Maximum	17.7	18.9	17.5	21.2
	Annual	7.7	6.4	6.7	7.1
Adelaide CBD	24 hour 70th pctl	8.7	9.1	8.1	8.0
	24 hour Maximum	17.2	15.1	17.8	15.8
	Annual	6.9	7.1	6.5	6.4

ND refers to no data available for this monitoring location
"pctl" refers to percentile calculations

Table 5 Measured background air pollutant concentrations, CO

Year	CO Monitoring Data Summary, 2015 – 2018 (µg/m³)				
	Averaging Time	2015	2016	2017	2018
Le Fevre 1	1 hour 70th pctl	ND	ND	ND	175.0
	1 hour Maximum	ND	ND	ND	800.0
	8 hour Maximum	ND	ND	ND	437.5
ND refers to no data available for this monitoring location					

4.4.3 Summary of Existing Air Quality Environment

Background pollutant concentrations adopted for this assessment are presented in **Table 6**. These values were combined with model-predicted Project contribution to assess cumulative air quality impacts.

The values for 24-hour PM_{10} and $PM_{2.5}$ were selected as the highest 70th percentile concentrations measured at the Adelaide stations (discussed above in **Section 4.4.2**). These values are considered conservative for the Littlehampton area which, apart from the three existing sources discussed in **Section 4.4.1** does not have any major sources of particulate matter.

The adopted background annual average PM_{10} and $PM_{2.5}$ concentration were taken as the average from the Adelaide stations for the period 2015 to 2018. The only significant sources of pa$PM_{2.5}$ in the Proposed Development area are traffic from the South East Freeway and other roads, and the two existing sources discussed in **Section 4.4.2**. These sources are relatively minor compared with the number of $PM_{2.5}$ sources (mainly traffic) in the Adelaide area. Based on this, average $PM_{2.5}$ concentrations in the Proposed Development area are expected to be lower than those measured in Adelaide and an average (rather than a maximum) was selected as a realistic estimate of conditions at the Proposed Development site.

The adopted background NO_2 and CO concentrations were estimated from the highest concentrations measured at the Adelaide stations. This is conservative due to fewer major sources of these pollutants in the Proposed Development area, compared with metropolitan Adelaide.

Table 6 Project Specific Background Air Quality

Indicator	Averaging Period	Background Concentration (µg/m³)	Statistic
PM_{10}	24-hour	28.0	Highest 24-hour 70th percentile (Netley)
	Annual	18.9	Average annual average from all stations
$PM_{2.5}$	24-hour	10.0	Highest 24-hour 70th percentile (Netley)
	Annual	7.3	Average annual average from all stations
NO_2	1-hour	96.4	Highest maximum 1-hour average (Netley)
	Annual	15.9	Highest annual average (Netley)
CO	1-hour	800	Highest 1-hour (Le Fevre 1)
	8-hour	437.5	Highest 8-hour (Le Fevre 1)

5.0 Assessment Methodology

5.1 Construction Impact Assessment - IAQM

Potential impacts from dust generation during construction have been assessed using the IAQM 2014 *Guidance on the assessment of dust from demolition and construction*. This document provides a semi-quantitative assessment process for the potential unmitigated impact of dust generated from demolition, earthmoving and construction activities. The IAQM approach has been widely used throughout the world to assess emissions from construction projects and has been accepted by many regulatory authorities as a suitable approach in the absence of other guidance document.

The potential of dust soiling, human health impacts, and ecological impacts due to particulate matter (PM_{10}) on surrounding areas were determined based on the scale of activities and proximity to sensitive receptors. The IAQM method uses a four-step process to assess dust impacts:

- Step 1: Screening based on distance to nearest sensitive receptors.
- Step 2: Assess potential of dust impacts from activities based on:
  - Scale and nature of the works, which determines the potential dust emission magnitude; and
  - Sensitivity of the area.
- Step 3: Determine site-specific mitigation for dust-emitting activities.
- Step 4: Reassess potential of dust impacts after mitigation has been considered.

For this assessment, it is assumed that there are no ecologically sensitive areas near the Proposed Development site and therefore the assessment for ecological impacts was not included.

5.1.1 Step 1 – Screening Assessment

Step 1 of the IAQM assessment requires the determination of whether there are any receptors close enough to warrant further assessment. IF any receptors are located within 350 m of the Proposed Development boundary, further assessment is required.

5.1.2 Step 2 – Dust Risk Assessment

Step 2 in the IAQM is designed to appraise the potential for dust impacts due to unmitigated dust emissions. The key components of the assessment involve defining:

- dust emission magnitudes (Step 2A),
- the surrounding area's sensitivity to dust emissions (Step 2B), and
- combining these in a matrix (Step 2C) to determine the potential for dust impacts on surrounding receptors.

5.1.2.1 Step 2A – Dust Emission Magnitude

Dust emission magnitudes are estimated according to the scale of works being undertaken classified as small, medium or large. The IAQM guidance provides examples of demolition, earthworks, construction and trackout to aid classification (refer Table 7).

Table 7 Classification criteria for small, medium and large demolition and construction activities

Activity		Small	Medium	Large
Demolition	Total building volume (m^3)	<20,000	20,000–50,000	>50,000
Earthworks	Total site area (m^2)	<2,500	2,500–10,000	>10,000
	Number of heavy earth moving vehicles active at one time	<5	5-10	>10
	Total material moved (tonnes)	<20,000	20,000–100,000	>100,000
Construction	Total building volume (m^3)	<25,000	25,000–100,000	>100,000
Trackout	Number of heavy vehicle movements per day	<10	10-50	>50

5.1.2.2 Step 2B – Sensitivity of Surrounding Area to Dust Soiling and Human Health Effects

The IAQM methodology classifies the sensitivity of an area to dust soiling and human health impacts due to particulate matter effects as high, medium, or low. The classification is determined by a matrix for both dust soiling and human health impacts (refer **Table 8** and **Table 9**, respectively). Factors used in the matrix tables to determine the sensitivity of an area are as follows:

- receptor sensitivity (for individual receptors in the area):
  - high sensitivity: locations where members of the public are likely to be exposed for eight hours or more in a day. (e.g. private residences, hospitals, schools, or aged care homes)
  - medium sensitivity: places of work where exposure is likely to be eight hours or more in a day
  - low sensitivity: locations where exposure is transient, around one or two hours maximum. (e.g. parks, footpaths, shopping streets, playing fields)
- number of receptors of each sensitivity type in the area
- distance from source
- annual mean PM_{10} concentration (only applicable to the human health impact matrix).

Table 8 Surrounding area sensitivity to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Surrounding area sensitivity to dust soiling effects on people and property corresponding to the risk categories need to be modified to match South Australia. In the absence of an annual average criterion for PM_{10} in the EPP (Air), the NEPM criterion for PM_{10} of 25 $\mu g/m^3$ was used and therefore the scaled criteria for the Proposed Development are >25, 22-25, 19-22 and <19 $\mu g/m^3$.

The adopted background PM_{10} concentration of 18.9 $\mu g/m^3$ for Proposal is presented in **Table 6**. However, there are higher annual average PM_{10} concentrations measured in the Adelaide area (outlined in **Section 4.4.2)**, which generally fit within the 22-25 $\mu g/m^3$ concentration range (refer to **Table 3**). The IAQM is a qualitative assessment, and therefore a conservative approach for selecting the sensitivity categories was adopted. The assessment was undertaken based on an annual average PM_{10} in the 22-25 $\mu g/m^3$ range. **Table 9** provides the IAQM guidance sensitivity levels for human

health impacts for the ranges outlined above - the annual average PM_{10} concentration has been conservatively adopted as 22-25 µg/m^3.

Table 9 Surrounding area sensitivity to human health impacts for annual average PM_{10} concentrations

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)				
		<20	<50	<100	<200	<350
High	>100	High	High	Medium	Low	Low
	10-100	High	Medium	Low	Low	Low
	1-10	High	Medium	Low	Low	Low
Medium	>10	Medium	Low	Low	Low	Low
	1-10	Low	Low	Low	Low	Low
Low	≤1	Low	Low	Low	Low	Low

Note: Annual average PM_{10} concentration has been conservatively adopted as 22-25 µg/m^3

The sensitivity for each construction activity defined by the IAQM guidance is assessed for the construction footprint. This results in a sensitivity rating. The ratings depend on the sensitivity of the receptors and the distance from the edge of the footprint. As shown in **Table 8** and **Table 9**, the greater the distance from the construction footprint (the source), the lower the rating. The highest rating achieved is adopted as the final rating for that particular group of receptors.

5.1.2.3 Step 2C – Potential of Unmitigated Dust Impacts

The dust emission magnitude as determined in Step 2A is combined with the sensitivity as determined in Step 2B to determine the potential dust impacts with no mitigation applied. **Table 10** provides the ranking for dust impacts from construction activities for each scale of activity as listed **in Table 7**.

Table 10 Potential dust impacts (for dust soiling and human health)

Activity	Surrounding area sensitivity	Dust emission magnitude		
		Large	Medium	Small
Demolition	High	High	Medium	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Negligible
Earthworks	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Construction	High	High	Medium	Low
	Medium	Medium	Medium	Low
	Low	Low	Low	Negligible
Trackout	High	High	Medium	Low
	Medium	Medium	Low	Negligible
	Low	Low	Low	Negligible

5.1.3 Step 3 – Management Strategies

The outcome of Step 2C is used to determine the level of management that is required to ensure that dust impacts on surrounding sensitive receptors are maintained at an acceptable level. A potential impact of high or medium level means that suitable management measures must be implemented during the Proposed Development.

5.1.4 Step 4 – Reassessment

The final step of the IAQM methodology is to determine whether there are significant residual impacts, post mitigation, arising from a proposed development. The guidance states:

For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be "not significant".

Based on this expectation, as well as experience in Australia, it can be demonstrated that construction activities with targeted mitigation measures can achieve high degrees of dust mitigation which significantly minimise dust impacts to a negligible level.

5.2 Operational Dispersion Modelling

5.2.1 Model Selection

5.2.1.1 TAPM Meteorological Model

TAPM is a prognostic model that predicts three-dimensional meteorology, including terrain-induced circulation effects. TAPM is a PC-based interface that is connected to databases of terrain, vegetation and soil type, leaf area index, sea-surface temperature, and synoptic-scale meteorological analyses for various regions around the world. TAPM is used to predict meteorological parameters at both ground level and at heights of up to 8,000 m above the surface; these data are required by the CALPUFF model. For this assessment, only the upper profile data was extracted from TAPM for use in CALMET.

5.2.1.2 CALPUFF Air Dispersion Model Suite

CALPUFF is a Lagrangian puff model and is used for regulatory Air Quality dispersion assessments throughout Australia. The CALPUFF modelling system consists of three main components and a set of pre-processing and post-processing programs. The main components of the modelling system are CALMET (a diagnostic three-dimensional meteorological model), CALPUFF (an air quality dispersion model), and CALPOST (a post-processing package). The main CALPUFF related software package programs are described in the following sections.

5.2.1.3 CALMET

CALMET is a meteorological model that develops hourly wind and temperature fields on a three-dimensional gridded modelling domain. Associated two-dimensional fields such as mixing height, surface characteristics and dispersion properties are also included in the file produced by CALMET. CALMET produces a meteorological file that is used within the CALPUFF model to predict the movement of pollution.

5.2.1.4 CALPUFF

Prediction of ground level particulate concentrations and dust deposition rates was made using the CALPUFF air dispersion model. The site-specific meteorological data set developed with TAPM and CALMET was used as input into CALPUFF. Sources were defined in CALPUFF in terms of location, size, and pollutant emission rates. Ground level concentrations were calculated by CALPUFF for each pollutant of interest across a sample grid covering the Proposed Development site for each hour in the modelled period. The post processing tool CALPOST was used to calculate ground level concentrations for the relevant averaging periods at each grid point and sensitive receptor. Contour plots of ground level concentrations were created using interpolation of grid point values.

5.2.2 Model Setup

The dispersion model CALPUFF was used to predict pollutant concentrations at nearby receptors and was set up in accordance with guidelines in South Australia's Environmental Protection Authority, Ambient Air Quality Assessment (EPA 2016) and Barclay and Scire (2011).

TAPM was run without any surface observation files using the input parameters presented in **Table 11**.

Table 11 TAPM input parameters

Parameter	Input
TAPM version	4.0.4
Number of grids (spacing)	4 (30 km, 10 km, 3 km, 1 km)
Number of grid points	25
Number of vertical levels	25
Terrain height database	9 second DEM
Year of analysis	January 2017 to December 2017
Grid centre point (mx,my) UTM Zone 54	304,745; 6,118,782

Four upper air profiles were extracted from the innermost 25 km x 25 km TAPM grid for input as upper air data into CALMET. Surface observations from four nearby Bureau of Meteorology (BoM) stations (wind speed and direction, air pressure, temperature, and relative humidity) were used in CALMET to supplement the TAPM synoptic data at the surface. CALMET input parameters are presented in **Table 12**.

Table 12 CALMET input parameters

Parameter	Input
CALMET Version	6.42
Meteorological domain	60 km by 54 km
Meteorological grid resolution	300 m (200 x 180 grid cells)
Grid centre point (mx,my) UTM Zone 56	313,000; 6,115,000
Meteorological data period	1 January 2017 to 31 December 2017
Surface observational data	BoM Kuitpo BoM Mt Lofty BoM Murray Bridge BoM Strathalbyn
Upper meteorological data	Extracted from TAPM at four locations (mx, my UTM Zone 54): • 312,745; 6,125,782 • 315,745; 6,114,782 • 296,745; 6,111,782 • 297,745; 6,121,782
RMAX1 (Radius of influence of meteorological stations: surface)	7 km
RMAX2 (Radius of influence of meteorological stations: aloft)	5 km
R1 (Observation weighting: surface)	4 km
R2 (Observation weighting: aloft)	3 km
IEXTRP (Vertical extrapolation of surface wind observation)	- 4 (extrapolate using similarity theory, exclude upper air observations from layer 1)
Radius of terrain influence (TERRAD)	7 km
BIAS (NZ) (Layer dependent weighting factor for initial guess field)	-1, -0.5, 0, 0.5, 1, 1, 1, 1, 1, 1

Parameter	Input
Number of vertical levels	10
Terrain data	30 m SRTM terrain data Available within the CALPUFF View modelling suite
Land use data	ABARES converted to USGS Sourced from: https://www.agriculture.gov.au/abares/aclump/land-use/catchment-scale-land-use-of-australia-update-december-2018 accessed on 16/12/2020

When using a single year of meteorological data as input into a dispersion model, it is necessary to demonstrate that the data are representative of long-term (greater than 12-months) meteorological conditions the Proposed Development area and of long-term regional behaviour. The main features of the generated meteorological data set are presented in **Appendix A**. The generated meteorological data set was considered representative of long-term meteorological conditions and expected regional behaviour; therefore, was suitable for use in this assessment.

General CALPUFF modelling parameters used in the assessment are presented in **Table 13**. The model was run in accordance with Barclay and Scire (2011).

Table 13 General CALPUFF input parameters

Parameter	Input
CALPUFF version	7.2.1
Computational domain	7 km x 5 km
Sampling domain	1.8 km by 1.8 km
Refined modelling grid resolution	50 m
Dispersion algorithm	Turbulence computed from micrometeorology and PDF method
Hours modelled	8760 hours
Meteorological data period	1 January 2017 – 31 December 2017

5.2.3 Modelling Scenarios

Two modelling scenarios were assessed for the operation of the Proposed Development.

- Scenario 1 – Proposal only (no existing CBP included)
- Scenario 2 – Proposal plus existing CBP. The existing CBP was included with an assumed operational throughput identical to the Proposed Development.

For both scenarios, the modelling was based on an operational output of 30,000 m^3 of product per year. The operational hours were based on 5am to 5 pm, 6 days per week and 50 week per year for the Proposed Development.

5.2.4 Emissions Inventory

A site-specific emissions inventory for each pollutant of interest was developed based on published emission factors listed in the National Pollutant Inventory Emission Estimation Manual for Concrete Batching Plants (NPI 1999) and the USEPA AP-42. The published emission factors were adopted due to the absence of site-specific emissions data. These are discussed further below.

Operational throughput data were provided by Holcim. A summary of adopted emissions factors and mitigation controls for each activity is presented in **Table 14**. PM_{10} to $PM_{2.5}$ correction factors were applied to $PM_{2.5}$ emission rates due to unavailability of published emission factors. The correction factors were taken from Cowherd et al (2006).

Table 14 Adopted emission factors for the Proposed Development

Activity	Emission Factor	Source	Units	$PM_{10}/PM_{2.5}$ Correction[1]	Variables
Wheel generated dust from unpaved roads	$EF_{PM_{10}} = \frac{0.4536}{1.6093} \times 1.5 \times \left(\frac{s}{12}\right)^{0.9} \times \left(\frac{W \times 1.1023}{3}\right)^{0.45}$	AP-42 (USEPA 2006) recommended in NPI (2012)	kg/VKT	0.1	s = material silt content in % W = weight of vehicle in t
Aggregate/ sand transfer[2]	0.0017 for PM_{10}	AP42 Table 11.12-1	kg/t	0.15	
Cement unloading (pneumatic transfer)-controlled	0.00017 for PM_{10}	AP42 Table 11.12-1	kg/t	0.15	
Weigh hopper loading	0.0013 for PM_{10}	AP42 Table 11.12-1	kg/t	0.15	
Truck loading	0.02 for PM_{10}	NPI (1999)	kg/t	0.15	
Wheel generated dust on sealed roads	$EF_{PM} = ((k(sL)^{0.91} x\, W^{1.02}) g/VKT$	AP42 Chapter 13.2.1	kg/VKT	NA	k = particle size multiplier sL = road surface silt loading (g/m^2) W = mean vehicle weight (tonnes)
Wind erosion on aggregate storage bins	3.9 for PM_{10}	NPI (2012) NPI (1999)	kg/ha/day	0.15	

1. Correction factors from Cowherd et al (2006)
2. Aggregate emission factor is higher than sand emission factor – aggregate emission factor used for all material conservatively

A summary of variables used in the emissions factor equations and emission inventory calculations is presented in **Table 15**.

Table 15 Variables used in the emissions inventory

Variable	Value	Units	Reference
Operational hours	3,350	hours	50 weeks[1] per year. Weekdays 5 am to 5 pm, Saturdays 5 am to 12 pm
Aggregate throughput	30,000	tonnes/year	Proposed
Sand throughput	30,000	tonnes/year	Proposed
Cement throughput	8,000	tonnes/year	Proposed
Product throughput	70,000	tonnes/year	Proposed
s – Silt content of unsealed haul road	4.8	%	AP42 Table 13.2.2-1 - sand and gravel processing – plant road[2]
sL – surface silt loading for sealed roads	12	g/m^2	AP42 Table 13.2.1-3 – mean value for concrete batching plants

Table notes:
1. Emission rate were estimated based on 50 weeks – however emissions were applied to all 52 weeks of the year in the model
2. Upper level haul roads will be unsealed but treated with cement to minimise dust emissions – a low silt content of 4.8 % is considered reasonable a reasonable estimate

Haul truck parameters used to estimate wheel-driven dust emissions are presented in **Table 16**.

Table 16 Haul truck parameters

Parameter	Aggregate/sand delivery trucks (truck and dog)	Cement tankers	Agitator trucks - hauling product offsite
Length (m)	19	14.0	8.5
Height (m)	4.3	3.7	3.7
Width (m)	2.5	2.5	2.5
Empty Weight (tonnes)	12	12	10
Load Capacity (tonnes)	40.0	23.0	11.67
Per hour	0.5	0.1	1.8
Total Daily Trips	5.5	1.3	21.8
Annual Vehicles	1,500	348	6,000
Annual Throughput (t)	60,000	8,000	70,000
Haul road length (m)	0.205	0.224	0.310
Annual Vehicle Kilometres Travelled (VKT)	308`	78	1860

Estimated combustion engine emissions for plant and trucks are presented in **Table 17**.

Table 17 Engine combustion emissions

Plant	Euro Standard	Utilisation (%)	Load Factor	Engine Power (kW)	Emission Factor (g/kWhr)				Emission Rate (g/s)			
					NOx	CO	PM_{10}	$PM_{2.5}$	NOx	CO	PM_{10}	$PM_{2.5}$
Front end loader	Stage IIIA	50%	0.55	100	4	3.5	0.3	0.3	0.031	0.027	0.002	0.002
Agitator trucks	Euro IV	50%	0.25	301	3.5	1.5	-[1]	-[1]	0.037	0.016	-[1]	-[1]
Cement tanker	Euro IV	50%	0.25	301	3.5	1.5	-[1]	-[1]	0.037	0.016	-[1]	-[1]
Aggregate/sand trucks	Euro IV	50%	0.25	301	3.5	1.5	-[1]	-[1]	0.037	0.016	-[1]	-[1]

Table notes:

1. Emission for PM_{10} and $PM_{2.5}$ are included in the emission factors for unsealed or sealed road emission are therefore not included here.

A summary of mitigated emission rates for each source in the model are presented in **Table 18**. These emission rates were calculated based on the operational days and hours listed in **Table 15**.

For calculation of 24-hour and annual concentrations, the emission rates were applied to the hours 5 am to 5 pm for all days in the model, as per the operational times discussed in **Section 2.2**. Inclusion of night-time hours is not likely to change the outcome of the assessment in terms of 24-hour averages, as the method in which emission rates were estimated was based on annual throughputs and compressed into the number of operational hours would require a reduction in emission magnitude to model the night time hours.

For prediction of 1-hour concentrations, the emission rates were applied to all hours of the model.

Wind erosion emissions from the aggregate storage bins were modelled continuously for 24 hours per day. The aggregate bins were assumed to have an area available for wind erosion of 160 m^2.

Table 18 Summary of emission rates by activity

Source	Emission Rate (g/s)			
	PM_{10}	$PM_{2.5}$	NOx	CO
Aggregate/sand delivery trucks - unsealed road	0.0152	0.0015	0.0366	0.0157
Agitator trucks - product transportation - sealed road	0.0154	0.0037	0.0366	0.0157
Cement tanker delivery - unsealed road	0.0029	0.0003	0.0366	0.0157
Aggregate/sand delivery	0.0099	0.0015	0.0306	0.0267
FEL pick up	0.0107	0.0036	0.0366	0.0157
Cement delivery	0.0001	0.0000	-	-
Weigh hopper loading	0.0065	0.0013	-	-
Load product to trucks	0.0580	0.0087	-	-
FEL to conveyor	0.0085	0.0013	-	-
Wind erosion from aggregate storage bins	0.00072	0.00011	-	-

5.2.5 Existing Concrete Batching Plant

As discussed in **Section 4.4.1**, the existing concrete batching plant (CBP) is expected to operate at a similar rate to the Proposed Development, with very similar emission source types. Based on this, the total emission rate (sum of all sources) for the existing CBP was set to match the total for the Proposed Development. As the exact location of emission sources is unknown, however, emissions were split evenly over several volume sources that were placed on the site of the existing CBP at locations identified on aerial images, such as raw materials storage bays.

5.2.6 Conversion of NO_X to NO_2

Nitrogen oxides are produced in most combustion processes and are formed during the oxidation of nitrogen in fuel and nitrogen in the air. During high-temperature processes, a variety of oxides are formed including nitric oxide (NO) and NO_2. NO will generally comprise 95 % of the NO_X by volume at the point of emission. The remaining NO_X will consist of NO_2. Ultimately, however, all nitric oxides emitted into the atmosphere are oxidised to NO_2 and then further to other higher oxides of nitrogen.

South Australia Department of Planning, Transport and Infrastructure's *Assessment of air quality impacts from road and rail infrastructure projects Environmental Instruction 21.9* lists a NOx to NO_2 conversion percentage of 20% for roads in SA. While the Proposed Development is not a road project, the sources of NO_x are very similar (internal combustion engines) and the 20% factor is appropriate for use. However, a conversion factor of 30% has been used in other jurisdictions for similar assessments and as a conservative measure, a value of 30% has therefore been applied to all NO_x predictions in this assessment.

6.0 Construction Impact Assessment

A semi-quantitative IAQM assessment was undertaken for the Proposed Development. This section outlines the outcomes of the assessment.

6.1.1 Step 1 - Screening assessment

Step 1 of the IAQM method involves a screening assessment of the number of sensitive receptors located near the Proposed Development. A summary of the approximate number of residential receptors that might experience air quality impacts due to construction works is presented in **Table 19**. As there are receptors located within 350 m of the site boundary (see **Figure 8**), the assessment moves to Step 2.

Table 19 Approximate number of impacted residences during pipeline construction activities

Distance from site boundary	Number of Sensitive Receptors
<20 m	0
20-49 m	0
50-99 m	0
100-350 m	57
Total <350 m	**57**

Figure 8 350m buffer from Project site

6.1.2 Step 2A – Dust Emission Magnitude

Potential dust emission magnitudes for the construction of the Proposed Development were estimated based on the IAQM guidance. The dust emission magnitudes are based on the scale of the anticipated works and are classified as Small, Medium, or Large. Activities on construction sites have been divided into four types to reflect their different potential impacts. These are:

- demolition

- earthworks
- construction
- trackout.

Justification and the factors used in determining the dust emissions magnitudes are presented in **Table 20**.

Table 20 Dust emission magnitudes in accordance with IAQM guidance

Activity	Potential Dust Emission Magnitude*	Justification
Demolition	**Small** (Total building volume <20,000 m^3)	• Demolition of existing buildings on lower level
Earthworks	**Small** (Site area <2,500 m^2, <5 heavy earth moving vehicles active at any one time, total material moved <20,000 tonnes)	• Total earthworks area (construction footprint) <2,500 m^2 • Earthworks for sediment basin and first flush pits – 2,000 m^3 (approx. 4,000 tonnes)
Construction	**Small** (Total building volume <25,000 m^3, construction material with low potential for dust release)	• Construction of new buildings (site office, ablutions) • Construction of batching infrastructure (silos, bins etc.) • Construction of hardpads
Trackout	**Small** <10 HDV (>3.5t) outward movements in any one day, unpaved road length <100 m.	• Total number of outward heavy truck movements is projected to be about 30 in total, which equates to considerably less than 10 per day.

Note: * Definitions for potential dust emission magnitude are defined in IAQM guidance

6.1.3 Step 2B – Sensitivity of the Surrounding Area

According to the IAQM guidance, the overall sensitivity of the construction works for dust soiling is human health impacts are classified as low. Justifications for the classifications are provided in **Table 21**.

Table 21 Sensitivity of the Proposed Development area in accordance with IAQM guidance

Potential Impact	Sensitivity of the Area	Justification
Dust Soiling	Low	The number of receptors surrounding the construction footprint are: • 57 high sensitivity receptor (residence) within 350 m Refer to **Table 8**
Human Health (PM_{10})	Low	The number of receptors surrounding the construction footprint are: • 57 high sensitivity receptor (residence) within 350 m Refer to **Table 9**

6.1.4 Step 2C – Unmitigated Risks of Impacts

The dust emission magnitudes for each construction activity in **Table 20** were combined with the sensitivity of the construction works in **Table 21** to determine the potential of construction dust air quality impacts, with no mitigation applied. The 'without mitigation' dust impacts for each IAQM activity have been calculated according to the methodology described in **Table 10**. Construction dust impacts according to IAQM methodology are summarised in **Table 22**.

Table 22 Summary of unmitigated construction dust risks using IAQM methodology

Activity	Step 2A: Potential for dust emissions	Step 2B: Sensitivity of area		Step 2C: Potential unmitigated dust impacts	
		Dust soiling	Human health (PM_{10})	Dust soiling	Human health (PM_{10})
Demolition	Small	Low	Low	Negligible	Negligible
Earthworks	Small	Low	Low	Negligible	Negligible
Construction	Small	Low	Low	Negligible	Negligible
Trackout	Small	Low	Low	Negligible	Negligible

The outcome of the air quality risk assessment based on the IAQM methodology shows that the unmitigated air emissions from construction pose a **negligible** for dust soiling and a **negligible impact** for human health.

6.1.5 Step 3 – Management Strategies

The outcome of Step 2C is used to determine the level of management that is required to ensure that dust impacts on surrounding sensitive receptors are minimised. A negligible or low-level risk rating does not mean that suitable management measures should be ignored as the potential for dust impacts, while low, still exists if care is not taken. Recommended site-specific and in-principle management measures are described in **Section 8.0.** With the implementation of these measures there should be minimal risk of nuisance dust impacts on surrounding receptors due to project construction.

6.1.6 Step 4 – Reassessment

With the mitigation measures outlined in **Section 8.0** in place, the post-mitigation potential of dust impacts due to construction of the Proposed Development are not expected to be significant.

7.0 Operational Modelling Results

Ground-level modelling results for mitigated emission rates for Scenario 1 (Proposal plus background) are presented for the Proposed Development-only and cumulative (Proposal plus background) in **Table 23**. All predicted concentrations at sensitive receptors were below the respective criteria. The Proposed Development was predicted to contribute much less to the cumulative results than the estimated background in all cases. A summary of the results are as follows:

- The highest predicted Proposal-only 24-hour PM_{10} concentration was 12.4 µg/m^3 (24.8 % of the criterion) at receptor 3. The highest cumulative concentration was 40.4 µg/m^3 (80.8 % of the criterion).
- The highest predicted Proposal-only annual average PM_{10} concentration was 0.7 µg/m^3 (2.8 % of the criterion) at receptor 2, 3, 4 and 5. The highest cumulative concentration was 19.6 µg/m^3 (78.4 % of the criterion).
- The highest predicted Proposal-only 24-hour $PM_{2.5}$ concentration was 2.2 µg/m^3 (8.8 % of the criterion) at receptor 3. The highest cumulative concentration was 12.2 µg/m^3 (48.8 % of the criterion).
- The highest predicted Proposal-only annual $PM_{2.5}$ concentration was 0.1 µg/m^3 (1.3 % of the criterion) at receptors 3 and 4. The highest cumulative concentration was 7.4 µg/m^3 (92.5 % of the criterion).
- The highest predicted Proposal-only 1-hour NO_2 concentration was 47.9 µg/m^3 (19.2 % of the criterion) at receptor 2. The highest cumulative concentration was 144.3 µg/m^3 (57.7 % of the criterion).
- The highest predicted Proposal-only annual NO_2 concentration was 0.3 µg/m^3 (0.5 % of the criterion) at receptors 1, 2, 3, 4 and 5. The highest cumulative concentration was 16.2 µg/m^3 (27.0 % of the criterion).
- All predicted Proposal-only CO concentrations were less than 1 % of the criteria.

Table 23 Predicted ground level pollutant concentrations at nearby sensitive receptors – Scenario 1 – Proposal plus background

Receptor	Predicted ground level pollutant concentration (ug/m3)															
	PM_{10} 24-hour		PM_{10} annual		$PM_{2.5}$ 24-hour		$PM_{2.5}$ Annual		NO_2 1-hour		NO_2 Annual		CO 1-hour		CO 8-hour	
	Prop. only[1]	Total[2]	Prop. only	Total	Prop. only	Total	Prop. only	Total	Prop. only	Total	Prop. only	Total	Prop. only	Total	Prop. only	Total
1	8.3	36.3	0.6	19.5	1.5	11.5	0.1	7.4	47.9	144.3	0.3	16.2	85.2	885.2	13.4	450.9
2	10.9	38.9	0.7	19.6	2.0	12.0	0.1	7.4	40.7	137.1	0.3	16.2	74.0	874.0	14.7	452.2
3	12.4	40.4	0.7	19.6	2.2	12.2	0.1	7.4	37.1	133.5	0.3	16.2	68.5	868.5	14.6	452.1
4	11.7	39.7	0.7	19.6	2.1	12.1	0.1	7.4	32.4	128.8	0.3	16.2	61.5	861.5	12.1	449.6
5	10.6	38.6	0.7	19.6	1.9	11.9	0.1	7.4	29.5	125.9	0.3	16.2	56.9	856.9	10.3	447.8
6	7.9	35.9	0.5	19.4	1.3	11.3	0.1	7.4	24.8	121.2	0.1	16.0	46.7	846.7	6.7	444.2
7	5.5	33.5	0.3	19.2	1.0	11.0	0.05	7.3	15.8	112.2	0.1	16.0	29.8	829.8	5.3	442.8
8	10.2	38.2	0.5	19.4	1.7	11.7	0.1	7.4	29.7	126.1	0.1	16.0	55.1	855.1	7.8	445.3
9	3.2	31.2	0.2	19.1	0.6	10.6	0.04	7.3	23.4	119.8	0.1	16.0	42.2	842.2	4.0	441.5
10	4.4	32.4	0.2	19.1	0.8	10.8	0.04	7.3	29.3	125.7	0.1	16.0	52.4	852.4	4.4	441.9
11	3.9	31.9	0.2	19.1	0.7	10.7	0.04	7.3	21.9	118.3	0.1	16.0	39.3	839.3	4.4	441.9
12	2.8	30.8	0.2	19.1	0.5	10.5	0.03	7.3	20.1	116.5	0.1	16.0	36.0	836.0	3.3	440.8
13	2.3	30.3	0.2	19.1	0.4	10.4	0.03	7.3	18.1	114.5	0.1	16.0	32.7	832.7	3.0	440.5
14	2.6	30.6	0.2	19.1	0.5	10.5	0.03	7.3	20.3	116.7	0.1	16.0	36.7	836.7	3.3	440.8
15	2.8	30.8	0.2	19.1	0.5	10.5	0.04	7.3	21.8	118.2	0.1	16.0	39.2	839.2	3.4	440.9
16	3.2	31.2	0.3	19.2	0.6	10.6	0.04	7.3	25.6	122.0	0.1	16.0	45.3	845.3	3.4	440.9
17	3.9	31.9	0.3	19.2	0.7	10.7	0.1	7.4	31.2	127.6	0.2	16.1	55.2	855.2	4.1	441.6
Highest	**12.4**	**40.4**	**0.7**	**19.6**	**2.2**	**12.2**	**0.1**	**7.4**	**47.9**	**144.3**	**0.3**	**16.2**	**85.2**	**885.2**	**14.7**	**452.2**
Criteria	**50**		**25**		**25**		**8**		**250**		**60**		**31,240**		**11,250**	

1. Prop. Refers to the Proposed Development
2. Total refers to the total of Proposal emission plus estimated background concentration

Ground-level cumulative modelling results for Scenario 2 (including the Proposed Development, existing CBP and background concentrations) are presented in **Table 24**. All predicted concentrations at sensitive receptors were below the respective criteria. A summary of the cumulative results are as follows:

- The highest predicted cumulative 24-hour PM_{10} concentration was 47.8 µg/m^3 (95.6 % of the criterion) at receptor 1. Most of this result was due to the adopted background concentration of 28.0 µg/m^3.
- The highest predicted cumulative PM_{10} concentration was 20.1 µg/m^3 (80.2 % of the criterion) at receptors 1, 2 and 3.
- The highest predicted cumulative 24-hour $PM_{2.5}$ concentration was 13.5 µg/m^3 (54.0 % of the criterion) at receptor 1.
- The highest predicted cumulative annual $PM_{2.5}$ concentration was 7.5 µg/m^3 (93.8 % of the criterion) at multiple receptors.
- The highest predicted cumulative 1-hour NO_2 concentration was 171.5 µg/m^3 (68.6 % of the criterion) at receptor 1.
- The highest predicted cumulative annual NO_2 concentration was 16.4 µg/m^3 (27.3 % of the criterion) at receptors 1, 2, 3, and 17.
- All predicted cumulative CO concentrations were less than 5 % of the criterion.

Table 24 Predicted cumulative ground level concentrations at nearby sensitive receptors – Scenario 2 – including existing CBP

Receptor	Predicted cumulative ground level pollutant concentration (µg/m$_3$)							
	PM_{10} 24-hour	PM_{10} Annual	$PM_{2.5}$ 24-hour	$PM_{2.5}$ Annual	NO_2 1-hour	NO_2 Annual	CO 1-hour	CO 8-hour
1	47.8	20.1	13.5	7.5	168.9	16.4	927.5	471.2
2	45.9	20.0	13.2	7.5	155.0	16.4	904.6	464.5
3	44.9	20.0	13.0	7.5	149.7	16.4	896.8	460.0
4	42.2	20.0	12.5	7.5	138.9	16.3	879.3	454.0
5	40.4	19.9	12.2	7.5	134.2	16.3	871.4	450.9
6	39.6	19.6	12.0	7.4	129.3	16.1	861.1	449.4
7	35.7	19.4	11.3	7.4	121.6	16.1	846.4	447.2
8	41.8	19.8	12.4	7.5	139.2	16.2	877.9	452.4
9	37.4	19.6	11.6	7.4	151.0	16.2	896.1	452.6
10	41.0	19.8	12.3	7.5	171.5	16.3	931.4	456.2
11	41.2	19.7	12.3	7.4	156.3	16.2	905.2	457.4
12	37.3	19.5	11.6	7.4	149.5	16.1	893.4	451.2
13	35.5	19.5	11.3	7.4	141.5	16.1	879.7	447.6
14	36.1	19.6	11.4	7.4	143.6	16.2	881.9	448.0
15	36.7	19.7	11.5	7.4	149.1	16.2	891.5	448.8
16	37.3	19.8	11.6	7.5	150.8	16.3	894.9	450.0
17	38.6	20.0	11.9	7.5	154.8	16.4	901.8	454.0
Background	**28.0**	**18.9**	**10.0**	**7.3**	**96.4**	**15.9**	**800**	**437.5**
Highest	**47.8**	**20.1**	**13.5**	**7.5**	**171.5**	**16.4**	**931.4**	**471.2**
Criteria	**50**	**25**	**25**	**8**	**250**	**60**	**31,240**	**11,250**

A contour plot for Proposal only 24-hour average PM_{10} concentrations is presented in **Figure 9**. This shows that the Proposed Development in isolation is not generating high concentration of PM_{10}.

Cumulative concentrations pollutants for Scenario 1 (Proposal plus background) are presented in **Figure 10** to **Figure 15**. Cumulative plots for Scenario 2 (Proposal, existing CBP plus background) are

presented in **Figure 16**, to **Figure** 20. The contours plots clearly show that concentrations remain below the criteria at all sensitive receptors for all pollutants for both Scenario 1 and Scenario 2.

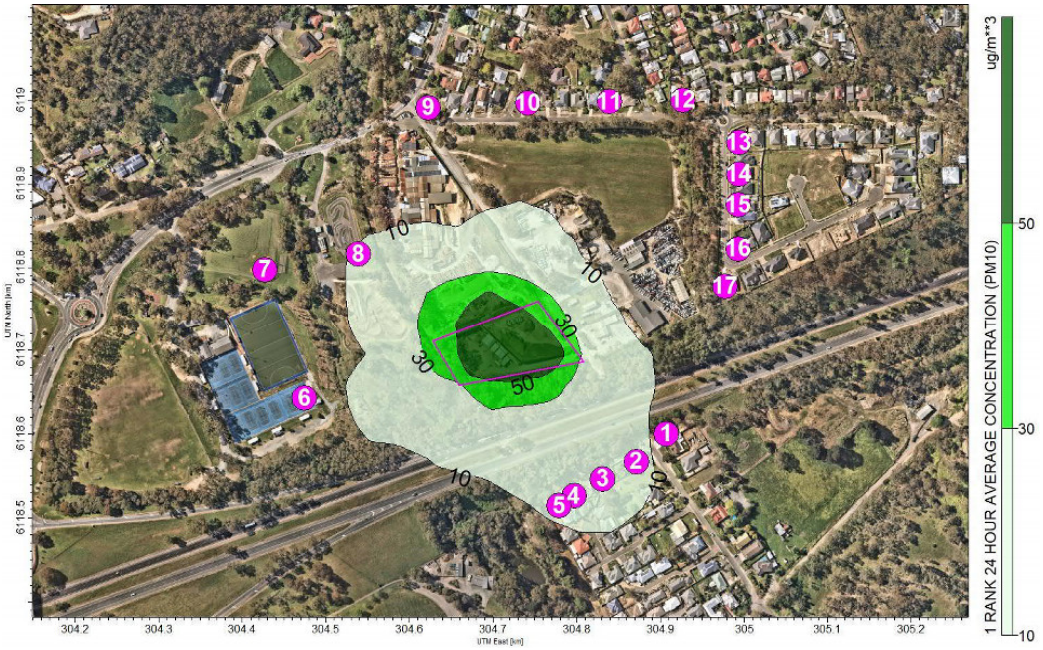

Figure 9 Predicted Proposal only 24-hour average PM_{10} concentrations – criteria 50 µg/m³

Figure 10 Predicted cumulative maximum 24-hour average PM_{10} concentrations – Scenario 1 - criteria 50 µg/m³

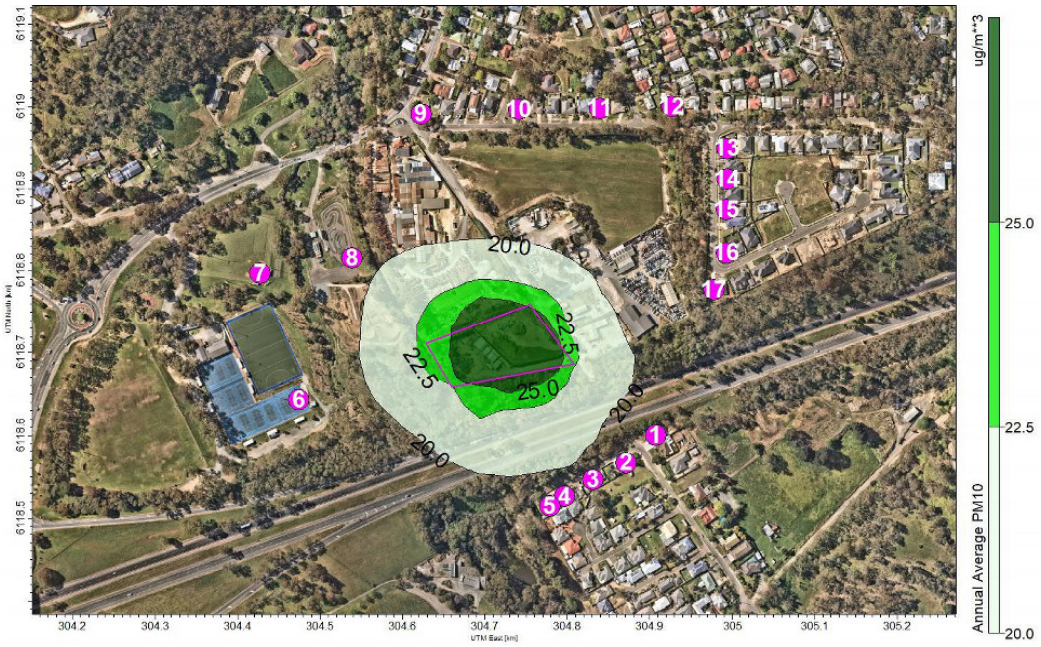

Figure 11 Predicted cumulative annual average PM_{10} concentrations – Scenario 1 - criteria 25 µg/m³

Figure 12 Predicted cumulative maximum 24-hour average $PM_{2.5}$ concentrations – Scenario 1 - criteria 25 µg/m³

Figure 13 Predicted cumulative annual average $PM_{2.5}$ concentrations – Scenario 1 - criteria 8 µg/m³

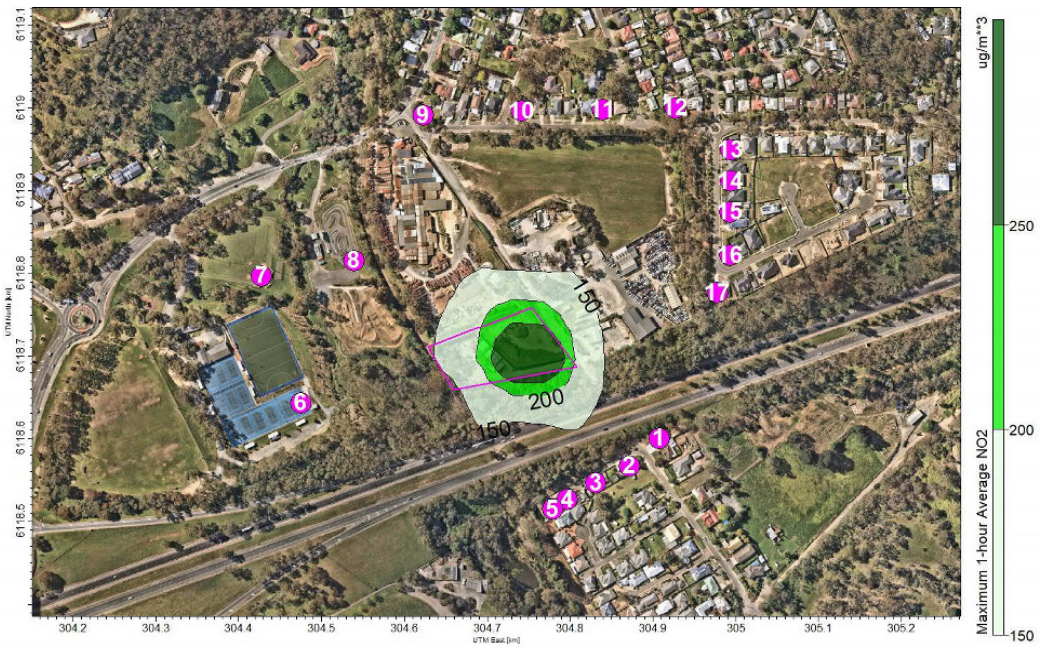

Figure 14 Predicted cumulative maximum 1-hour average NO_2 concentrations – Scenario 1 - criteria 250 µg/m³

Figure 15 Predicted cumulative annual average NO_2 concentrations – Scenario 1 - criteria 60 µg/m³

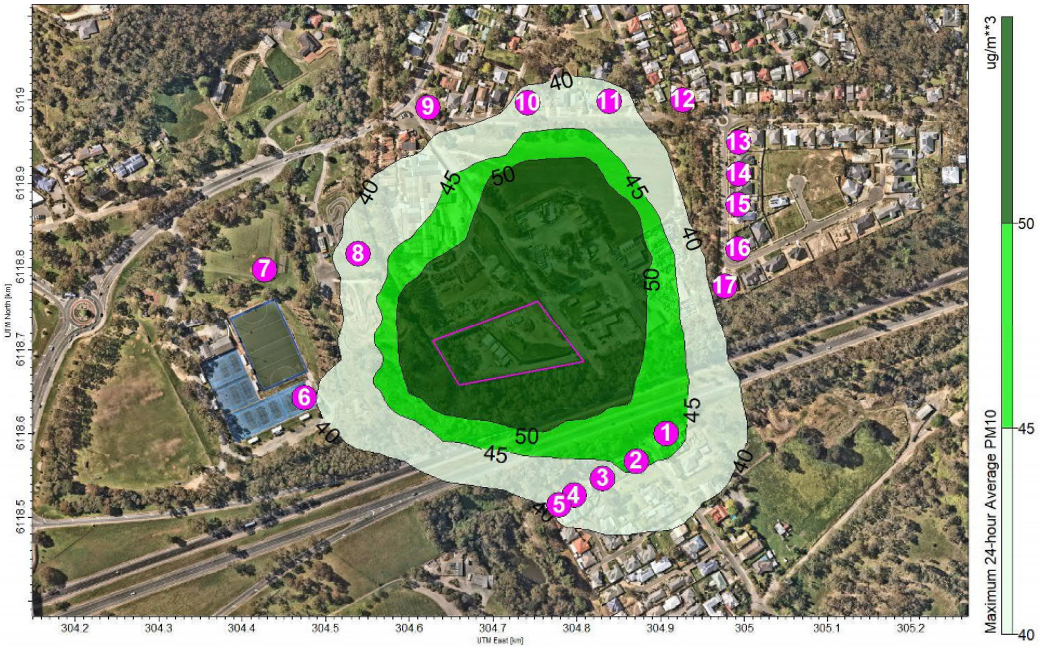

Figure 16 Predicted cumulative maximum 24-hour average PM_{10} concentrations – Scenario 2- criteria 50 µg/m³

Figure 17 Predicted cumulative annual average PM_{10} concentrations – Scenario 2- criteria 25 µg/m³

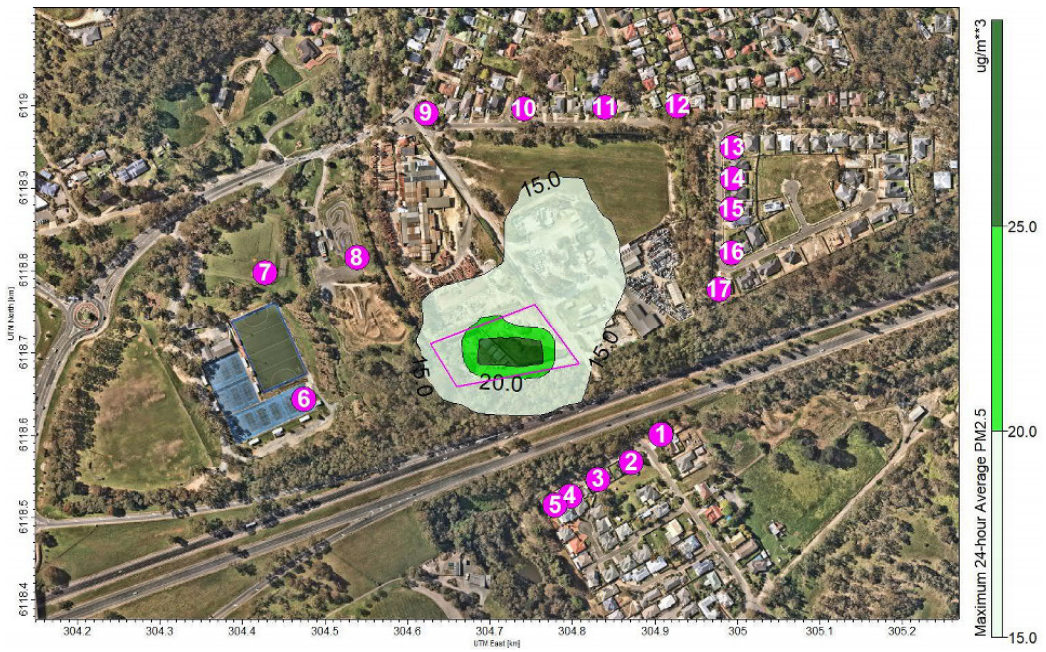

Figure 18 Predicted cumulative maximum 24-hour average $PM_{2.5}$ concentrations –Scenario 2 - criteria 25 µg/m³

Figure 19 Predicted cumulative annual average $PM_{2.5}$ concentrations – Scenario 2 - criteria 8 µg/m³

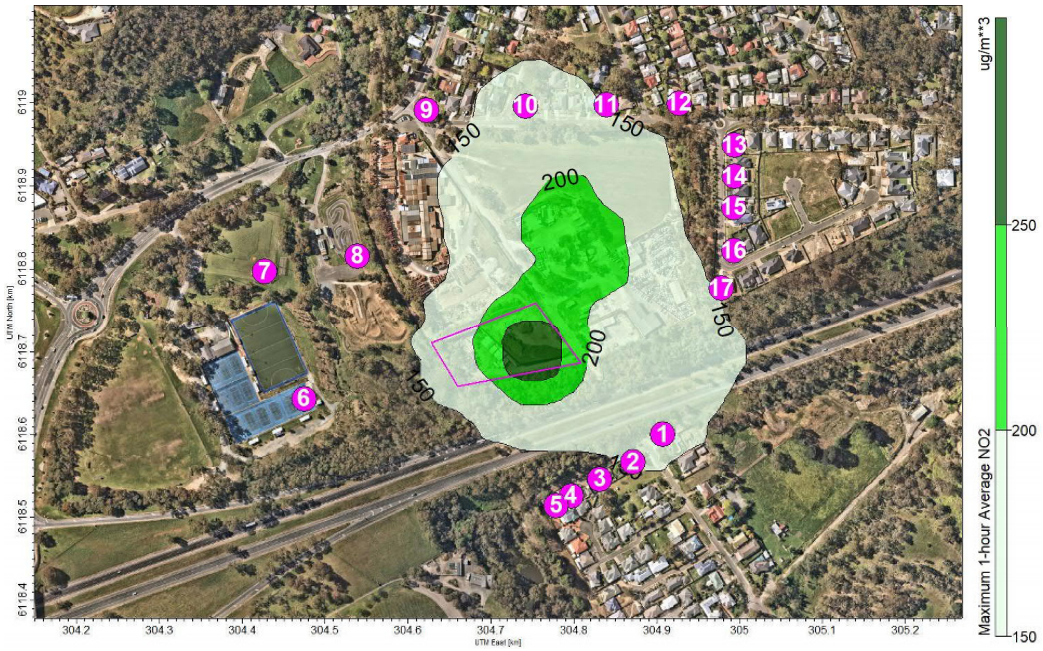

Figure 20 Predicted cumulative maximum 1-hour NO_2 concentration – Scenario 2- criteria 250 µg/m³

8.0 Mitigation and Control

The management of air emissions at the Proposed Development will involve a number of in-principle mitigation strategies aimed at reducing overall emissions from the following primary sources of dust emissions:

- Vehicle wheel-driven dust
- Handling and transfer of raw materials

Suitable mitigation strategies would need to be implemented during the construction or operation of the Proposed Development to minimise potential air quality impacts. These include but are not limited to the following:

- Keep hardstands and sealed roads clean and free of dusty material as much as possible
- Limit drop heights of dusty materials
- Reduce rate of earthworks on windy days or if visible dust is leaving site
- Install and maintain a dust filter system in the cement silo
- Raw material bins shall be enclosed on three sides to reduce potential for wind-blown emissions
- Material transfer points to be covered where practicable
- Aggregate bins should be enclosed on three sides
- Trucks hauling raw materials should have their payload covered

9.0 Conclusion

An air quality assessment has been conducted to assess the potential for offsite impacts due to dust emissions from construction and operation at the proposed Holcim Littlehampton concrete batching plant.

A qualitative construction air quality impact assessment was undertaken for the Proposed Development using the UK Institute of Air Quality Management's tool for assessment of construction dust. The outcome of the assessment was that dust impacts due to construction for the Proposed Development would be negligible at nearby receptors for dust soiling and human health impacts.

Operational air emissions were assessed by means of air dispersion modelling. Emission sources for the Proposed Development were identified and emission rates estimated using published emission factors. Relevant mitigation strategies and controls were then applied to the emission rates where applicable.

Incremental impacts due to the emission from the Proposed Development (not including the existing concrete batching plant or background concentrations) were predicted to be minor, with all concentrations well below the respective criteria. The highest predicted fraction of a criteria was 24.8 % for 24-hour average PM_{10}. All other incremental concentrations were well below this level.

Cumulative impacts were also assessed for the Proposed Development by adding both background monitoring data and estimated ground level concentrations from the neighbouring concrete batching plant. The modelling predicted that cumulative ground level concentration for all identified pollutants across all averaging periods would be below ambient air quality criteria the Proposed Development during operation at sensitive receptors.

This assessment showed that construction and operation of the Proposed Development is not anticipated to result in any significant air quality impacts at nearby sensitive receptors, provided the recommended operational controls are implemented.

10.0 References

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Mount Barker District Council
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17 February 2021

Appendix A

Model Meteorological Data Analysis

Appendix A Model Meteorological Data Analysis

Meteorological data

A full year of meteorological data (2017) was included in the modelling, allowing predictions of potential air impacts due to Project operations for all diurnal and seasonal variations in meteorology. To ensure that the chosen year of meteorological data was representative of a typical year, the data were compared against long term trends in the region.

Meteorological data used in the dispersion modelling were developed with inputs from observational data measured at four nearby Bureau of Meteorology (BoM) monitoring stations. The locations of the four stations and their distance from the Proposed Development site are presented in **Table 25**. Hourly meteorological data used in the modelling was averaged from one-minute data purchased from BoM. The data coverage periods are also presented in **Table 25.**

Table 25 Details of BoM stations included in the modelling

Station	Latitude/ Longitude	Distance from Project	1-min Data Coverage
Mt Lofty	-34.98, 138.71	16 km	2001-current
Kuitpo Forest Reserve	-35.17, 138.68	21 km	2011-current
Murray Bridge (Pallamana Aerodrome)	-35.07, 139.23	33 km	2011-current
Strathalbyn	-35.28, 138.89	25 km	2010-current

Selection of the Meteorological Year

The main features of the generated data set and a comparison with long term meteorological data measured at the four BoM stations are provided in this validation. Note that the meteorological conditions for the single year of data used for the model will not match the long-term data exactly due to yearly variation in meteorology. The purpose of this section is to demonstrate that the general long-term trends are replicated satisfactorily by the 2017 data set.

A review of the meteorological data from BoM met stations for the years 2011 to 2019 was carried out to determine a representative year of data for use in the CALMET modelling. Consideration was given to a range of different parameters, including wind speed & direction, percentage of calms and their comparison to the long-term BoM trends. Additionally, an analysis of the Southern Oscillation Index (SOI) was undertaken to ensure the year of meteorological data selected for the model was not adversely impacted by either an El Nino or La Nina event.

Nine years of recent SOI data is presented in **Figure 21**, with monthly averages at the top and yearly averages at the bottom. This shows that the years 2013, 2017 and 2018 were the most neutral of the nine years with an average SOI index of close to zero, which indicates that meteorological data for that year not highly impacted by an El Nino/La Nina event.

Average wind speeds and calms frequency by hour of day for the BoM stations are for the period 2011 to 2019 are presented in **Figure 22** (Mt Lofty), **Figure 23** (Kuitpo), **Figure 24** (Murray Bridge) and **Figure 25** (Strathalbyn). At each of the BoM stations, the year 2017 appears to have a slightly higher frequency of calm conditions, and lower than average wind speeds (particularly at Mt Lofty and Kuitpo). Under such conditions dispersion of pollutants is typically reduced and the use of a dataset with a high number of calms and low wind speeds can provide conservative modelling results.

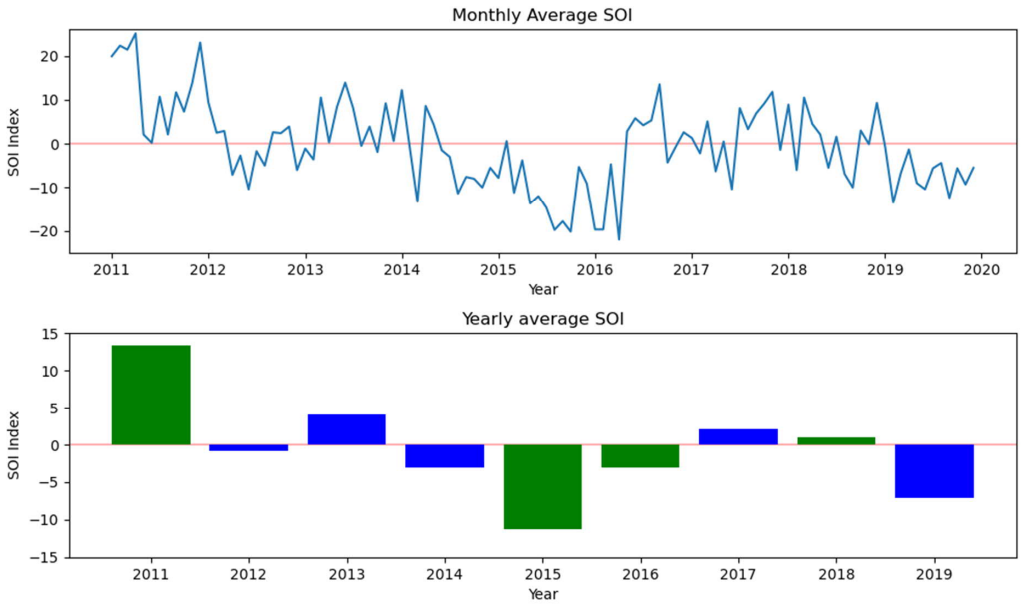

Figure 21 Nine-year SOI trend

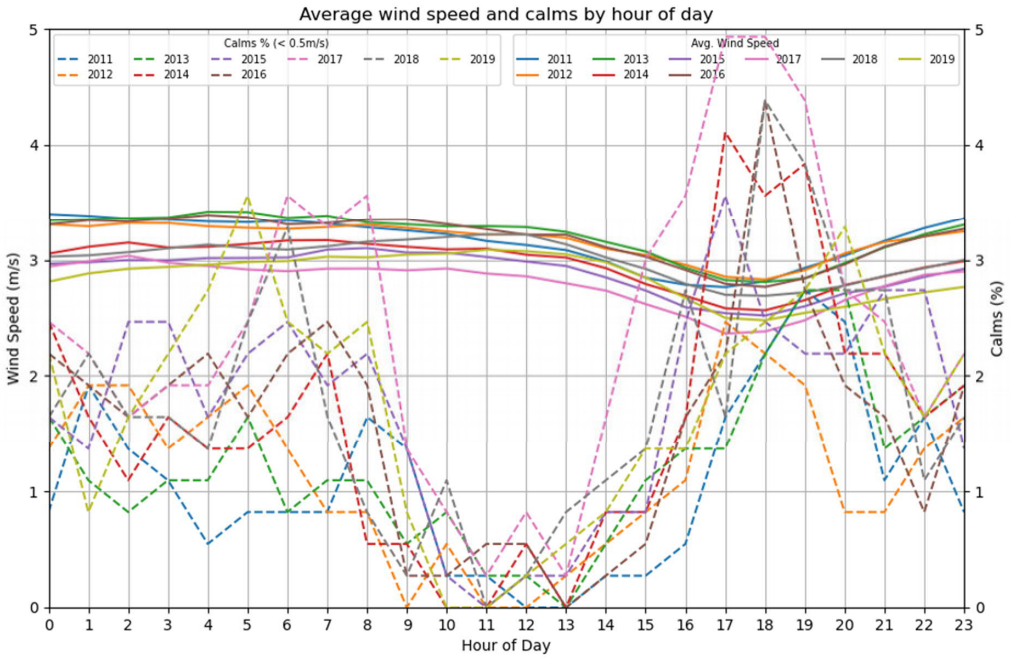

Figure 22 Nine-year wind speed and calms trends by hour of day – BoM Mt Lofty

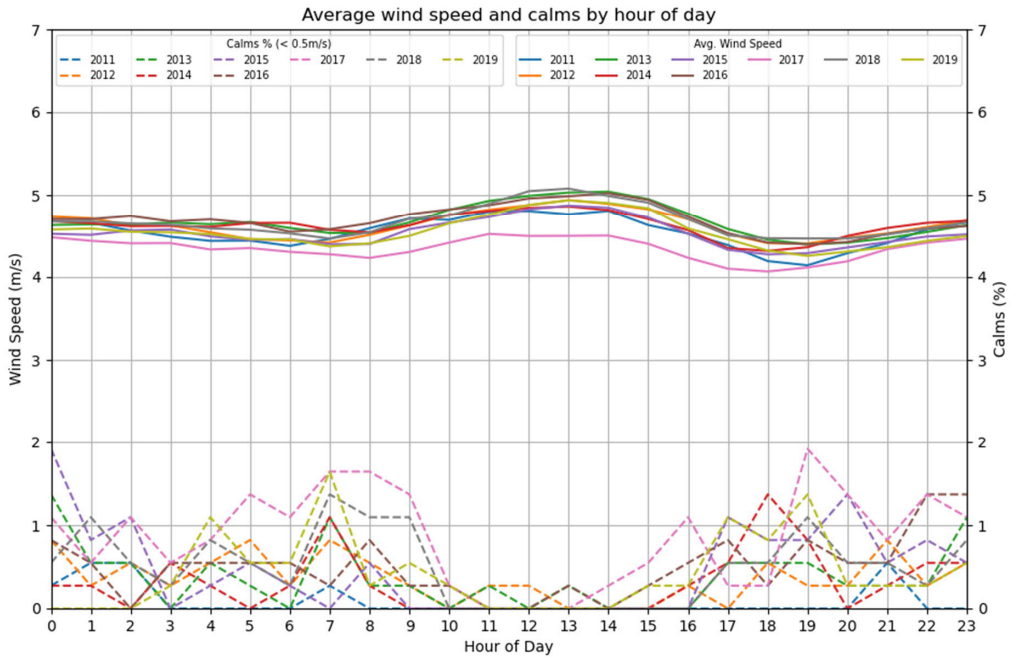

Figure 23 Nine-year wind speed and calms trends by hour of day – BoM Kuitpo

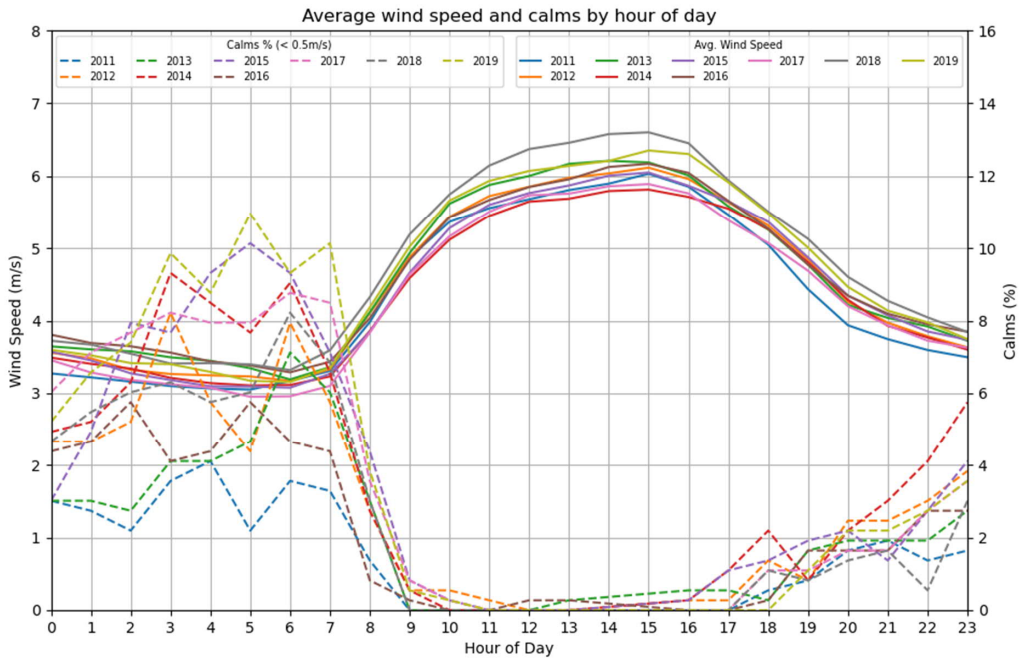

Figure 24 Nine-year wind speed and calms trends by hour of day – BoM Murray Bridge

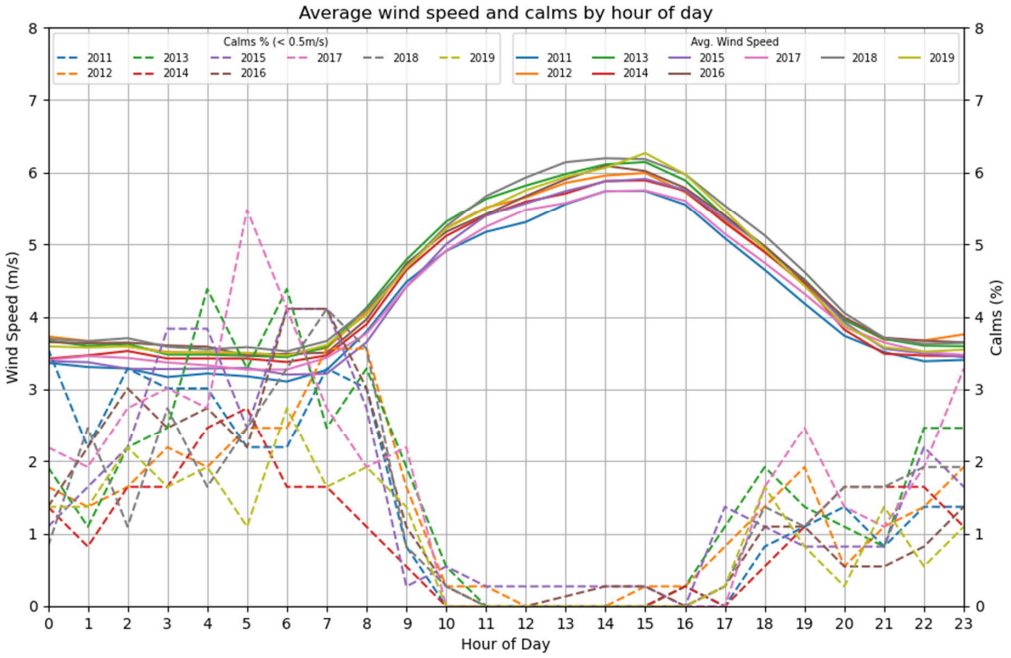

Figure 25 Nine-year wind speed and calms trends by hour of day – BoM Strathalbyn

Wind direction is also an important consideration when selecting a year of representative meteorology. Wind direction (and wind speed) can be presented in wind rose diagrams which show the frequency of winds from each direction in terms of wind speed categories. Wind roses showing all hours of wind data for 2017 are compared with long term (2011-2019) wind roses for the four BoM stations in **Figure** 26. All four stations show an almost identical wind rose for 2017 compared with the 2011 to 2019 period. This suggests that winds in 2017 were consistent with winds for the 2011 to 2019 period. The wind roses also show that overall, wind speed patterns for each direction in 2017 were consistent with long term trends.

Based on the analysis of SOI, frequency of wind speeds and calms, and wind direction at each of the four BoM stations, 2017 was likely to be fairly typical in terms meteorology, but also should provide a slightly conservative set of wind speed data for use in the model. Meteorological data from 2017 was therefore selected for use in this assessment.

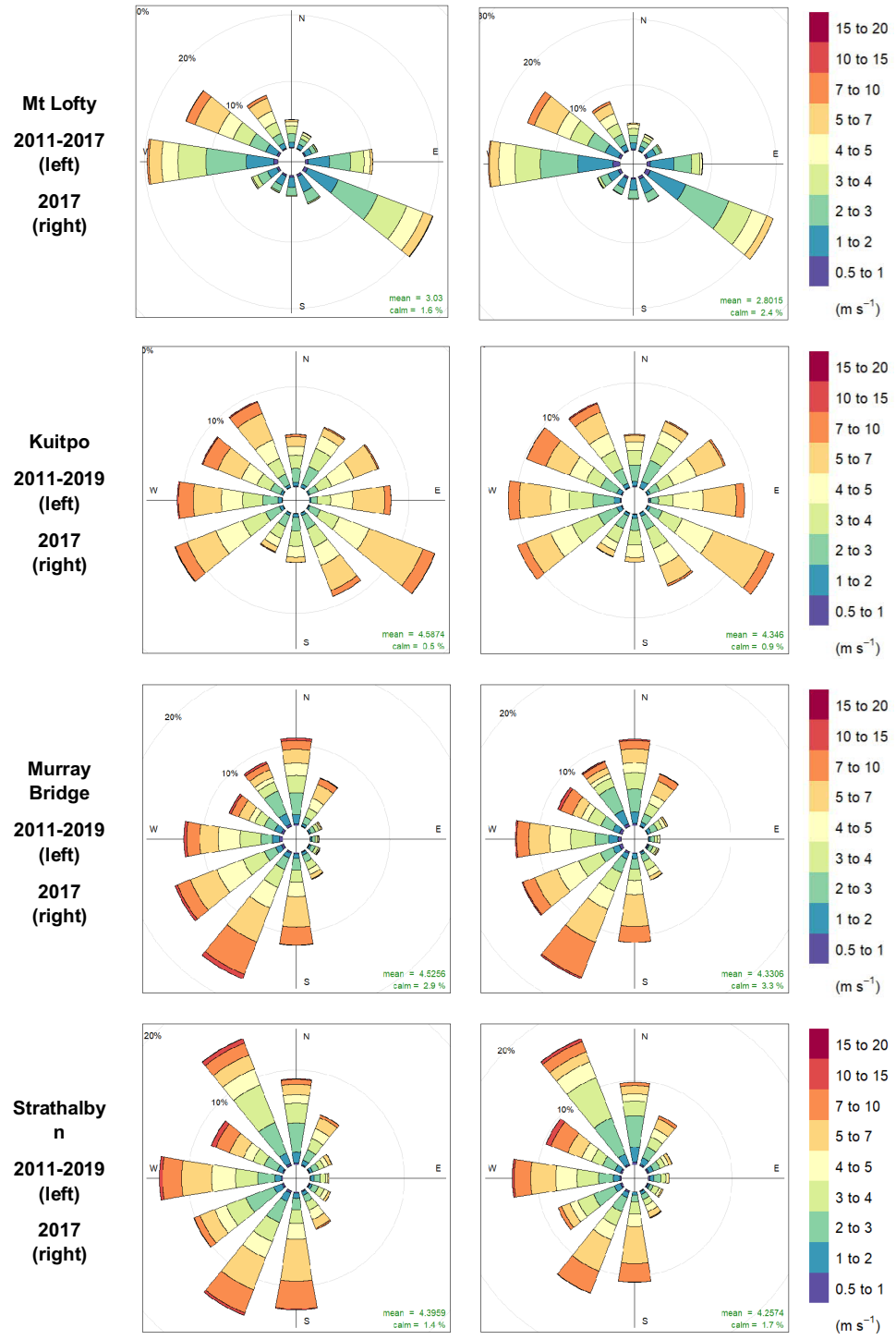

Figure 26 Long term (2011-2019) winds (left) compared with 2017 winds (right) at the four BoM stations

CALMET 2017 Meteorological Data Analysis

A 12-month meteorological data set was generated for 2017 in CALMET. Data predicted at the Proposed Development site was extracted from the model and analysed to ensure CALMET was performing as expected. Wind speed and direction, atmospheric stability, mixing heights, and temperature data from CALMET are analysed in the following sections.

CALMET Winds

All-hours wind rose diagrams for the Proposed Development site (data generated by the CALMET meteorological model), are compared with long-term wind roses for the BoM Kuitpo stations in **Figure 27**. The BoM Kuitpo station was selected for comparison here due to it being the nearest station to the Proposed Development site at a similar elevation (the BoM Mt Lofty station is closer but is located on top of Mt Lofty at an elevation of around 700 m and winds would likely be very different to the Proposed Development site).

The wind roses show the frequency of occurrence of winds by direction and strength. The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds) and so on. The length of the bar represented frequency of occurrence of winds from that direction. The widths of the bars correspond to wind speed categories, the narrowest representing the lightest winds.

The all-hours CALMET and Kuitpo wind roses are quite similar and display the northwest and southeast winds that are common in the Adelaide Hills. Overall, the CALMET data shows a good correlation with the long-term BoM observations at Kuitpo, although wind speeds are slightly lower than those measured at Kuitpo. The Kuitpo station is about 20 kilometres form the Proposed Development site so differences are expected. The CALMET data has a very slightly higher frequency of calms (1.4 %) compared with the BoM station (0.9 %).

Seasonal wind roses for CALMET and BoM Kuitpo are presented in **Figure 28** and **Figure 29** respectively.

Summer winds for CALMET and BoM Kuitpo station show very frequent southeast winds. There is a slightly higher frequency of west winds at the Kuitpo site, perhaps reflective the location of Kuitpo on the eastern edge of the Adelaide Hills escarpment.

Winter winds are dominated by northwest winds at both the Proposed Development site and Kuitpo. There is a higher frequency of southwest and east winds observed at Kuitpo during winter compared with CALMET at the Proposed Development site.

Autumn and Spring are transition seasons between the opposing summer and winter wind patterns with a mix of the southeast and northwest winds at both sites.

Wind speeds are slightly lower for the CALMET data compared with the BoM Kuitpo station during all seasons. The lower winds are likely attributable to a slightly more inland location and the hills that surround the Proposed Development site, which can be seen in **Figure 30**. The hill-top location of the BoM Kuitpo station near the eastern Adelaide Hills escarpment (seen in **Figure 30**) edge likely exposes the station to stronger winds compared with the Proposed Development site.

Overall, the 2017 CALMET data at the Proposed Development site shows expected wind patterns that display similarities with the long-term BoM Kuitpo observations, with differences due to location and terrain features.

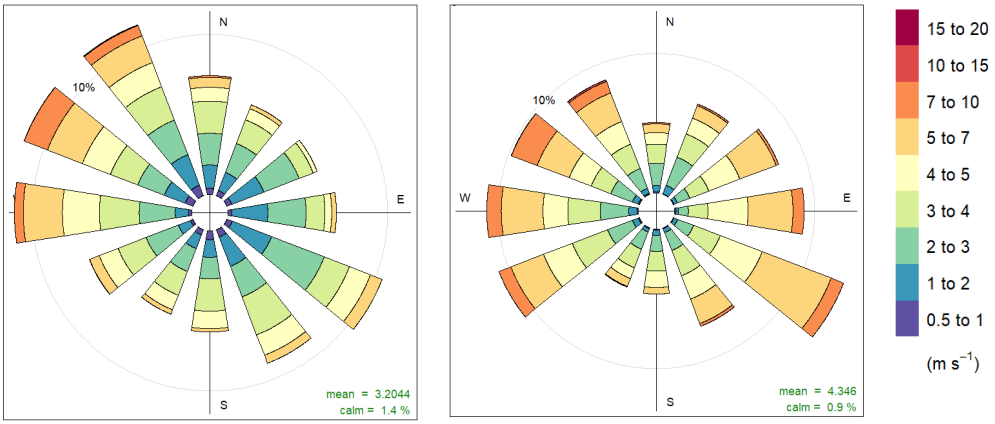

Figure 27 All-hours wind roses – CALMET compared against long-term BoM Kuitpo and Murray Bridge

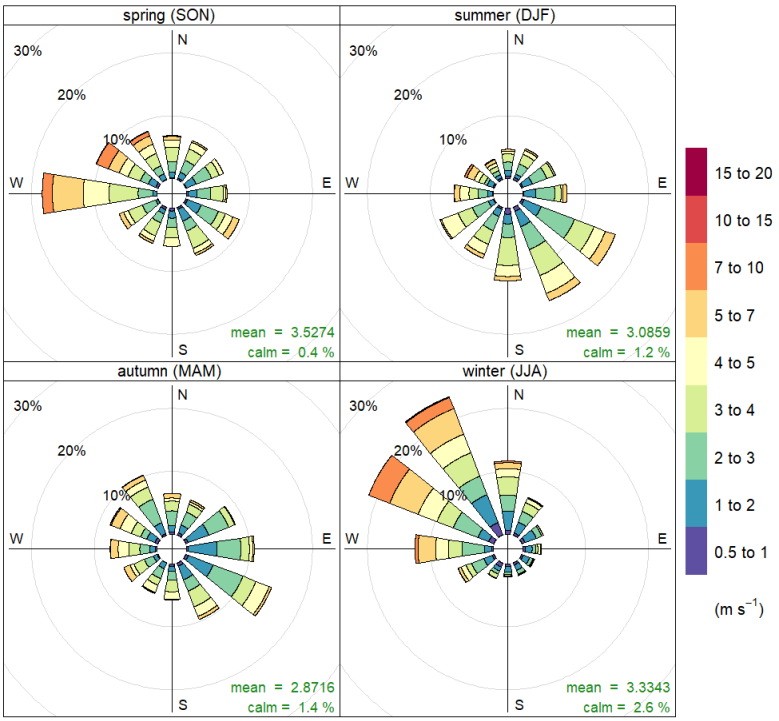

Figure 28 CALMET 2017 seasonal wind roses

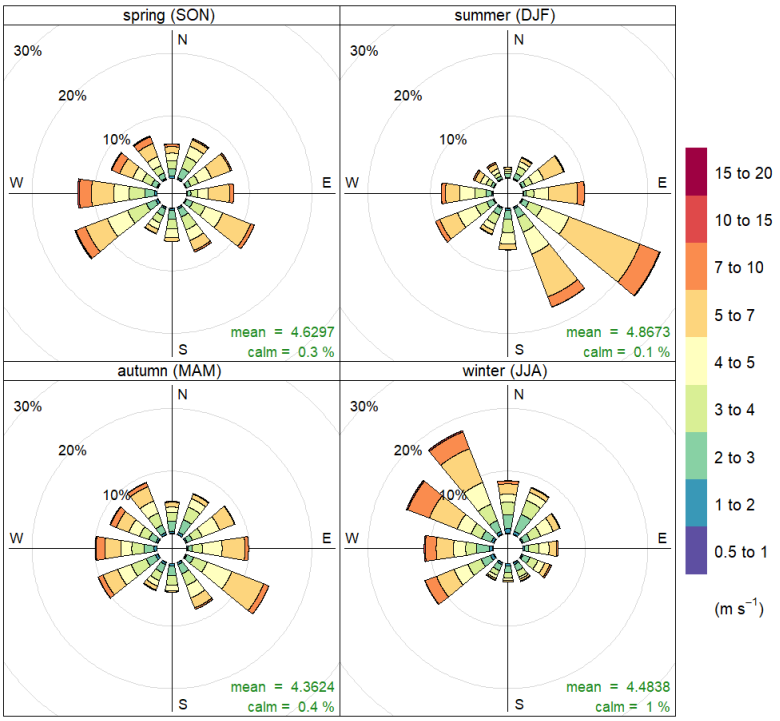

Figure 29 BoM Kuitpo (2011 to 2019) seasonal wind roses

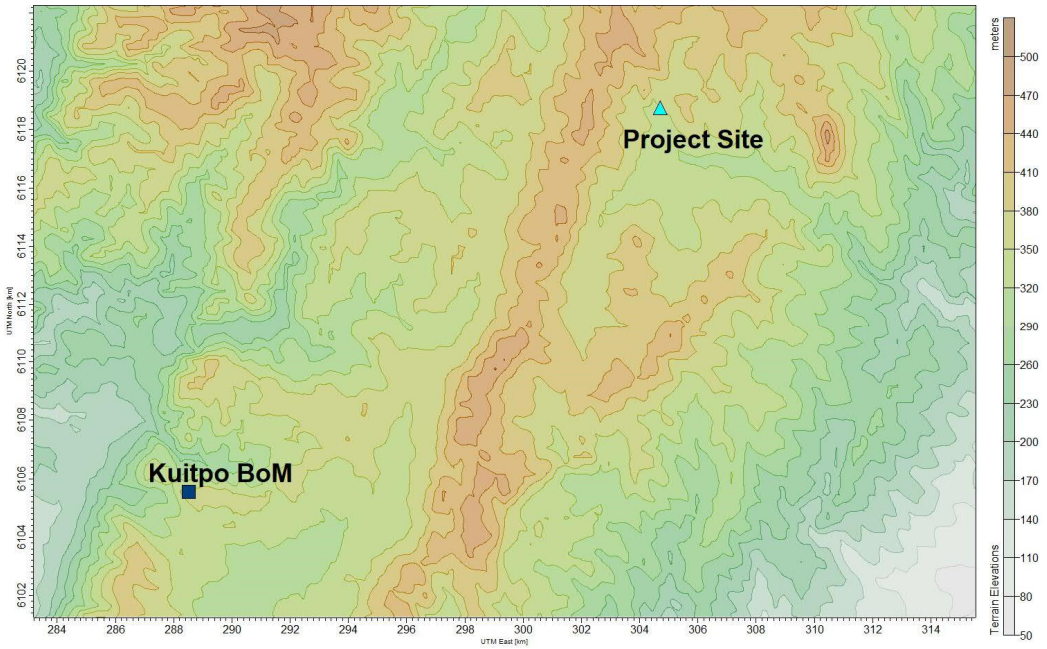

Figure 30 Comparison of terrain features surrounding the Proposed Development site and BoM Kuitpo station

Atmospheric Stability

Stability is a measure of the convective properties of a parcel of air. Stable conditions occur when convective processes are low, while unstable conditions are associated with stronger convective processes, which are associated with potentially rapid changes in temperature. Stable atmospheres occur when a parcel of air is cooler than the surrounding environment, so the parcel of air (and any pollution within it) sinks. Conversely, unstable atmospheres occur when a parcel of air is warmer than the surrounding environment, making the parcel of air buoyant and, subsequently, leading to the parcel of air rising.

Stability class data extracted from the CALMET files at the Proposed Development location were analysed. The following chart shown in **Figure 31** indicates stability classes designated as 1 to 6, which correspond to the Pasquill-Gifford A – F stability class designations (1 corresponds to A class and 6 corresponds to F class). Classes A, B and C (or 1, 2 and 3) represent unstable conditions, with class A representing very unstable conditions and C representing slightly unstable conditions. Class D (4) stability corresponds to neutral conditions, which are typical during overcast days and nights. Classes E and F (5 and 6) correspond to slightly stable and stable conditions respectively, which occur at night.

As expected, the stability classes indicate stable conditions during the night hours and neutral or unstable conditions during the day. The stability classes were then plotted by wind speed as shown in **Figure 32**. As expected, the highest wind speeds (> 4 m/s) were associated with neutral conditions. Lower wind speeds (<3 m/s) are mostly associated with neutral or stable conditions. This represents a typical pattern of stability and shows that CALMET is performing well at the Proposed Development site.

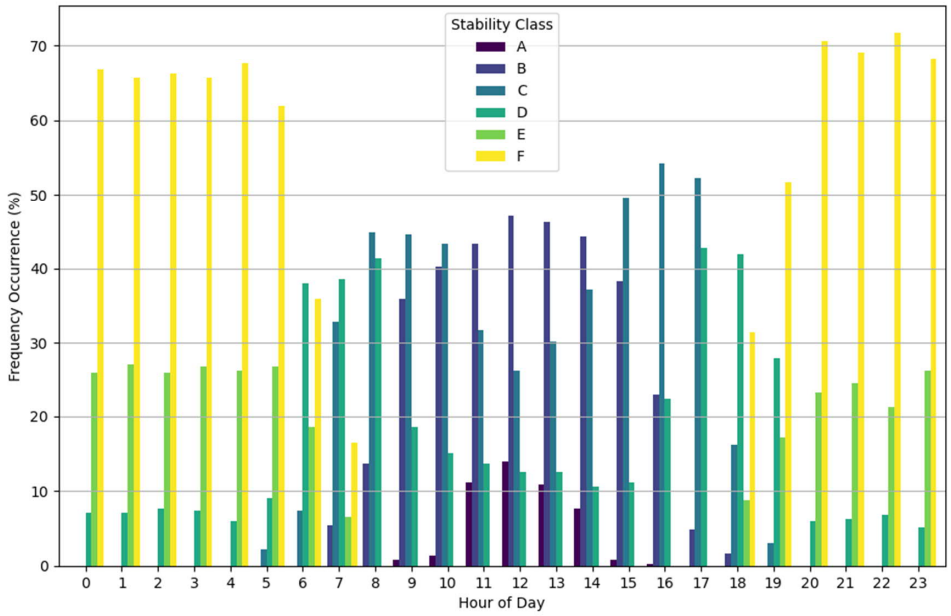

Figure 31 CALMET hourly stability class frequency at the Proposed Development site

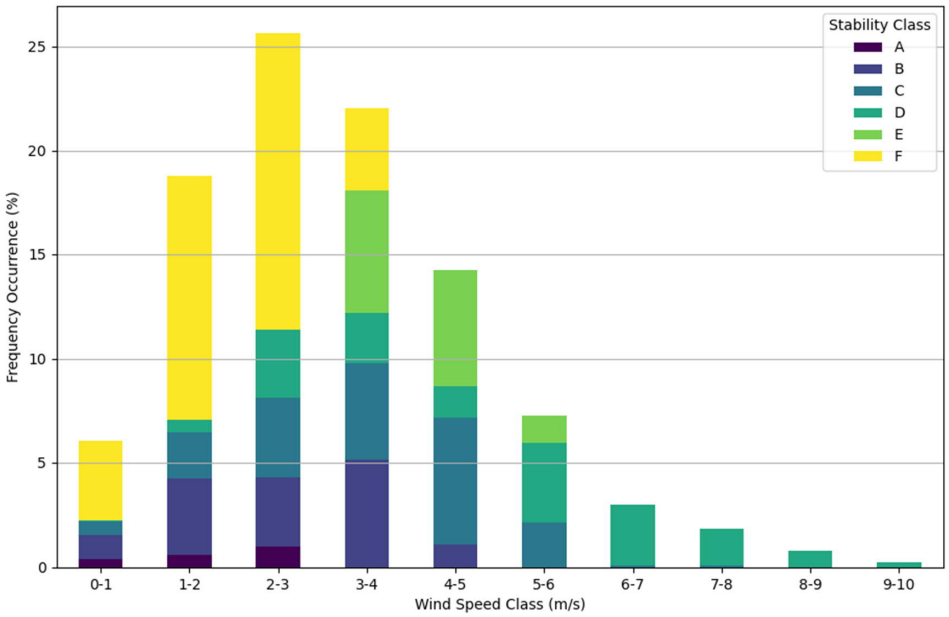

Figure 32 CALMET stability class frequency by wind speed at the Proposed Development site

Mixing Height

Mixing height is estimated within CALMET for stable and convective conditions (respectively), with a minimum mixing height of 50 m. **Figure 33** presents average mixing height by hour of day at the Proposed Development site, as generated by CALMET. These results are consistent with general atmospheric processes that show increased vertical mixing with the progression of the day, as well as lower mixing heights during night-time. In addition, peak mixing heights are consistent with typical ranges.

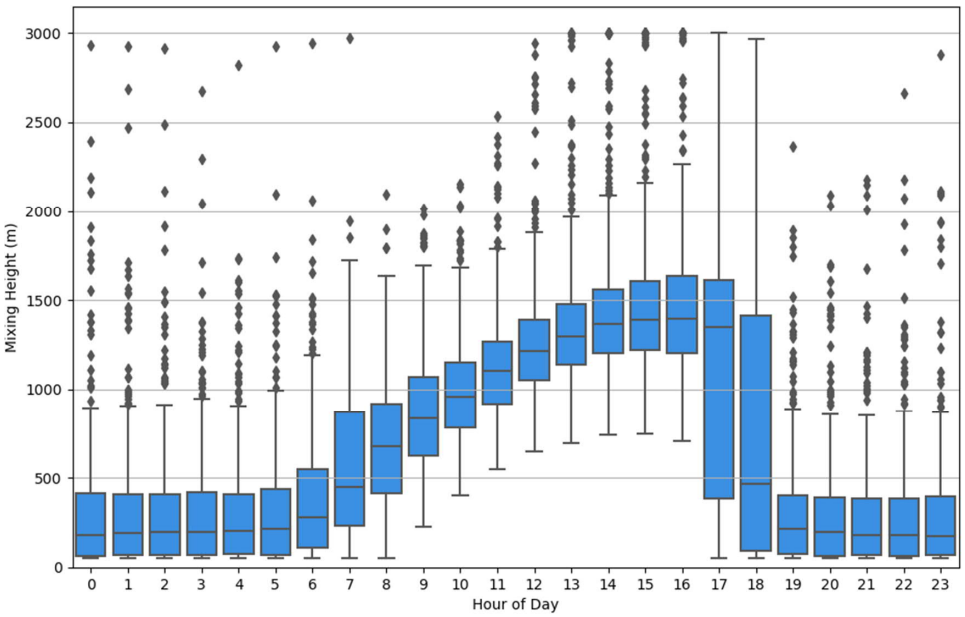

Figure 33 CALMET average mixing height by hour of day at the Proposed Development site

Temperature

Temperature statistics for the CALMET data at the Proposed Development site are presented in **Figure 34**. The data shows a typical pattern that is expected in the Adelaide Hills, with average temperatures ranging from around three degrees Celsius (on winter mornings) to about 38 degrees Celsius (summer afternoons).

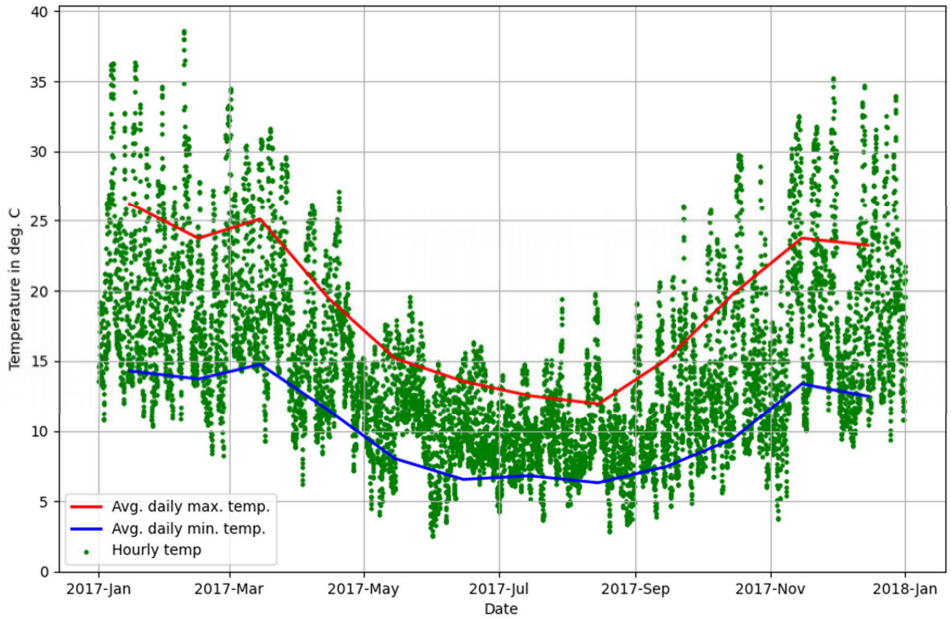

Figure 34 CALMET temperature statistics by hour of day at the Proposed Development site

Summary of 2018 CALMET Dataset

The analysis of the 2018 CALMET dataset presented in this appendix shows that CALMET is performing well compared with long term weather observations at the nearby BoM stations. The CALMET dataset is expected to provide a representative description of meteorology at the Proposed Development site and is therefore suitable for use in CALPUFF for this assessment.

Attachment 5

Acoustic Assessment

GROUNDWORK PLUS

JANUARY 2021

HOLCIM LITTLEHAMPTON

CONCRETE PLANT DEVELOPMENT APPLICATION ACOUSTIC ASSESSMENT

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REV	DATE	DETAILS
0	20 January 2021	Initial issue

	NAME	DATE	SIGNATURE
Prepared by:	Adam Cook	20 January 2021	
Reviewed by:	Greg Barry	20 January 2021	
Approved by:	Simon Moore	20 January 2021	

TABLE OF CONTENTS

GLOSSARY

Acoustic terminology

A-Weighting	The "A" weighting scale is designed to adjust the absolute sound pressure level to correspond to the subjective frequency response of the human ear.
Assessment period	15-minute period for noise emission assessment against criteria derived from the Noise Policy
Day time	Period between 07:00 and 22:00, as defined in the Noise Policy
dBA	A-Weighted decibels, measurement unit for sound levels.
L_{eq}	Noise descriptor providing a single number measure of time varying sound. Represents the equivalent level of steady noise (energy equivalent) compared to that of an actual time varying sound, recorded over a measurement interval. The period the measurement is averaged over may be included in the subscript, i.e. $L_{eq,15min}$
L_{90}	A statistical noise descriptor used to quantify the background noise level. Representative of the noise level which is not exceeded 90 percent of the measurement interval.
Night time	Period between 22:00 and 07:00, as defined in the Noise Policy
Noise Policy	South Australian *Environment Protection (Noise) Policy (2007)*

Extractive industry terminology and abbreviations

FEL	Front End Loader
HME	Heavy Mobile Equipment

1 INTRODUCTION

WSP has been engaged by Groundwork Plus Pty Ltd (Groundwork Plus) to undertake a Development Authorisation acoustic assessment for the proposed Littlehampton Concrete Plant (the Site) at Littlehampton, South Australia. The Site is to be operated by Holcim (Australia) Pty Ltd (Holcim).

It is understood that the subject land was previously occupied by an asphalt plant, and will be cleared to make way for a newly constructed Concrete Plant (the Proposed Development). The retaining wall and fence structure through the middle of the site is to be retained to feature in the Proposed Development site layout.

Operating hours of the Proposed Development will be 05:00 – 17:00 Monday to Friday, and 05:00 – 12:00 Saturday. As these proposed operating hours include both the day and night noise assessment periods, outcomes of this acoustic assessment are based upon the more onerous night time assessment period, and are therefore applicable for if the site was to operate on a 24-hour basis (noting that this is not currently proposed).

The layout of the Proposed Development within the Site is shown in Figure 1.1.

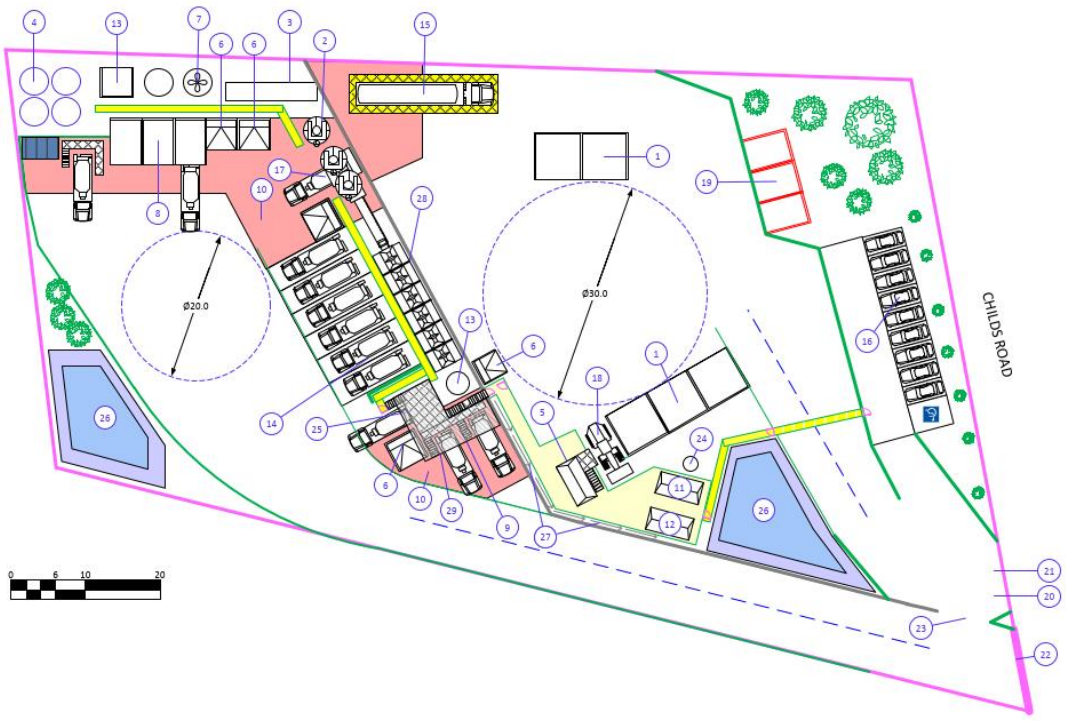

Figure 1.1 Layout of proposed Holcim Site

This report presents a summary of the acoustic assessment undertaken for the Proposed Development, including measurements of existing conditions, the applicable noise criteria, assessment methodology, noise modelling results and recommendations.

Where noise criteria are predicted to be exceeded conceptual noise mitigation options are discussed.

2 EXISTING CONDITIONS

2.1 LOCALITY AND NOISE SENSITIVE RECEIVERS

The Proposed Development is located on land in a locality which currently accommodates a range of industrial and warehousing land uses. The Site is bounded by the adjacent properties to the North and East (across Childs Road), the South-Eastern Freeway to the South, and by the former Victor Harbour Railway Line to the West. The position of the proposed Site is shown in Figure 2.1.

Figure 2.1 Proposed Site and surrounding localities

The nearest noise-sensitive receivers to the site are residential properties to the North, East and South. Each of these residential localities (identified as 'R' in Figure 2.1) are separated from the site by either industrial properties or by the South-Eastern Freeway. A school (indicated as 'S' in Figure 2.1) is also located to the south-west of the site, separated from the locality by the South-Eastern Freeway.

For brevity, this assessment considers predictions of noise levels at the nearest noise-affected sensitive receivers within the noise sensitive localities. Eight such locations are utilised, shown in Figure 2.1, selected as representative of worst-case locations for noise emissions from the Proposed Development.

2.2 EXISTING NOISE ENVIRONMENT

Attended noise measurements were taken in December 2020 to capture the existing noise environment in the locality of the Proposed Site. Figure 2.2 shows the noise measurement locations.

Figure 2.2 Measurement locations

Measuremetns were undertaken using an NTi XL2 TA sound level meter, which is a Class 1 Type Approved sound level meter suitable for field and laboratory use. A copy of the current certificate of calibration for this equipment is included in Appendix A.

Measurement results and observations recorded during the attended measurements are provided in Table 2.1.

Noise at M01 and M02 was typically controlled by traffic on Old Princes Highway, with some noise from heavy vehicles on the South-Eastern Freeway occasionally audible.

At M03 noise was audible from construction sources in the nearby residential subdivision, and some occasional noise from the South-Eastern Freeway.

At M04 some noise from an existing concrete batching plant on Childs Road was audible, mostly from truck movements on that site.

Noise levels at M05 were controlled by traffic on the South-Eastern Freeway.

Table 2.1 Attended measurement observations

TIME	LOCATION	OBSERVATIONS	MEASURED LEVEL [L_{EQ}, dBA]
Day time measurements			
11/12/2020 11:00	M01	Measurement controlled by traffic on Old Princes Highway. Mixture of light and heavy vehicle traffic.	57
11/12/2020 11:18	M02	Measurement controlled by traffic on Old Princes Highway. Mixture of light and heavy vehicle traffic. Some occasional heavy vehicle noise from the South-Eastern Freeway. Birds occasionally audible in nearby trees.	54
11/12/2020 11:33	M03	Mostly noise from distant traffic on the South-Eastern Freeway, some occasional noise from construction of nearby housing development. Noise from birds in nearby trees and wind in foliage.	48
11/12/2020 11:48	M04	Steady noise from traffic on the South-Eastern Freeway. Some noise audible in the background from trucks moving on the existing concrete batching plant on corner of Childs Road and Griffiths Court.	49
11/12/2020 12:12	M05	Steady noise from traffic on the South-Eastern Freeway. Noise from birds in nearby trees and wind in foliage.	56

3 NOISE CRITERIA

3.1 DEVELOPMENT ACT (1993)

It is understood that the Proposed Development is subject to a Development Authorisation assessment pursuant to the South Australian *Development Act (1993)* (the Act). Under the Act, the Development Plan is the relevant policy document which provides the guidelines and criteria for which proposed development is required to adhere.

Mount Barker District Council Development Plan is the relevant Development Plan for the Proposed Site. In the '*Interface between land uses'* section it provides the following Principles of Development Control (PDCs) which are relevant to noise:

1 Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:

…

(b) Noise

...

8 *Development that emits noise (other than music noise) should include noise attenuation measures that achieve the relevant Environment Protection (Noise) Policy criteria when assessed at the nearest existing noise sensitive premises.*

9 *Development with the potential to emit significant noise (e.g. industry) should incorporate noise attenuation measures that prevent noise from causing unreasonable interference with the amenity of noise sensitive premises.*

In accordance with PDC 8, an assessment of noise and vibration levels from the Proposed Development is required against the South Australian Environment Protection Authority's *Environment Protection (Noise) Policy 2007*.

3.2 ENVIRONMENT PROTECTION (NOISE) POLICY 2007

The South Australian Environment Protection Authority's *Environment Protection (Noise) Policy 2007* is the relevant policy for the assessment of noise from industry operating within South Australia.

When a noise assessment for a Development Authorisation is invoked under the *Development Act 1993*, Part 5 of the Noise Policy guides derivation of the assessment criteria, which are summarised in Table 3.1.

Table 3.1 Development Authorisation noise criteria

RECEIVER ZONE	NOISE CRITERIA [dBA]		
	DAY [07:00-22:00]	NIGHT [22:00-07:00]	
Rural Landscape Protection Zone (R01)	51 $L_{eq,15min}$	44 $L_{eq,15min}$	-
Residential Zone (R02 – R06)	50 $L_{eq,15min}$	43 $L_{eq,15min}$	60 L_{Amax}
Residential Zone (R07)	47 $L_{eq,15min}$	40 $L_{eq,15min}$	60 L_{Amax}
Commercial Zone (S01)	57 $L_{eq,15min}$	50 $L_{eq,15min}$	-

Details of derivation of noise criteria for this assessment are provided in Appendix B.

To determine compliance with these noise criteria, the Noise Policy requires prediction of the Source Noise Level, the future operational noise from the Proposed Development.

The relevant receiver assessment location and procedures for prediction of a Source Noise Level for comparison against the criteria are provided in Part 3 of the Noise Policy. Source Noise Levels are to be assessed at outdoor locations frequented by persons residing at the residential premises surrounding the Site and should consider contributions from all sources of noise in the Proposed Development that could operate during a 15-minute period.

The Source Noise Level must be adjusted by the following amounts if the noise source contains modulation, tonal, impulsive, or low-frequency characteristics:

- +5 dBA if the noise source contains 1 characteristics
- +8 dBA if the noise source contains 2 characteristics
- +10 dBA if the noise source contains 3 or more characteristics

Noise modelling has been undertaken for the Proposed Development to predict the Source Noise Levels for the day and night assessment periods.

4 TECHNICAL APPROACH

4.1 NOISE MODELLING INPUTS

The following data inputs and information was used to develop the noise models for each Stage of the Project:

- Terrain elevation data from Geoscience Australia 1-Second DEM Version 1.0, sourced in December 2020
- Site layout drawing, proposed building designs, on site activity details and on-site vehicle paths, provided by Groundwork Plus in December 2020 and January 2021.
- Equipment sound power levels from manufacturer data sheets and WSP's internal database

4.2 NOISE MODELLING APPROACH

Prediction of the Source Noise Levels for future Site operation was undertaken using noise models developed in SoundPLAN v8.2 noise modelling software.

Noise modelling considers on-site operations from the Proposed Development which could occur simultaneously in a 15-minute period.

Assessments have been undertaken for both day time and night time operation of the Proposed Development, based upon the future plant understood to be operational during these periods.

4.2.1 SITE FEATURES

The Proposed Development site is divided into two ground surface levels. A lower hardstand area is delineated from the north-eastern side of the site by a concrete retaining wall structure, which also features a large sheet metal fence on top of the retaining wall. These site features provide significant noise mitigation to sources located in the lower hardstand area. Figure 4.1 shows images of the retaining wall and fence structure from the eastern and southern boundaries. Both the retaining wall and fence are included in the noise model.

Figure 4.1 Retaining wall and fence structure (Source: Holcim documentation)

4.2.2 ENVIRONMENTAL CONDITIONS

Ground surfaces within developed areas of the Site and surrounding industrial area were modelled as acoustically reflective hard ground (ground absorption coefficient = 0.0).

Other areas surrounding the Site were modelled as partially absorptive ground (ground absorption coefficients between 0.6-0.8, 0.6 in residential areas, 0.8 in open grassed areas such as the freeway road corridor). This is considered a conservative approach for representing the mixture of residential, rural living, road corridor and agriculture uses surrounding the Site, which typically feature proportions of absorptive and reflective ground conditions.

4.2.3 METEOROLOGICAL CONDITIONS

Noise propagation was calculated using the CONCAWE industrial noise propagation algorithm.

CONCAWE can predict noise levels under varying meteorological conditions which effect the propagation of noise. For this assessment, meteorological conditions which are most conducive for noise propagation were utilised, namely:

- CONCAWE meteorological Category 5 for the day time-period
- CONCAWE meteorological Category 6 for the night time-period.

These CONCAWE meteorological condition inputs are consistent with those suggested by the SA EPA in their guideline document *"Guidelines for Use of the Environment Protection (Noise) Policy 2007"*.

4.2.4 NOISE SOURCES

Noise sources included in modelling are representative of the highest level of site activity which could occur in a 15-minute period, based on the planned site use advised by Groundwork Plus and Holcim.

The following noise sources are considered in noise modelling undertaken for the Proposed Development:

Vehicle movements

3x concrete agitator movements

1x aggregates tipper truck and dolly (total 50T)

1x cement tanker

1x light vehicle.

Plant

Batching plant loading agitator truck

Wash-down of agitator truck

2x FEL material moving between aggregate bins and live bin system

Conveyer between live bin system and agitator loader

3x concrete agitator trucks idling.

4.2.5 RECEIVER LOCATIONS

Noise levels were predicted at representative receiver locations defined in accordance with the requirements of Clause 12 of the Noise EPP.

Receptors in the noise models were positioned at outdoor areas which would be frequented by persons residing at the properties in the residential areas. The noise model receptors are positioned in the free field, away from shielding or reflections from built form, and noise levels are predicted for a receptor height of 1.5 metres above local ground level.

4.2.6 NOISE CHARACTER PENALTIES

In accordance with the Noise Policy, noise character penalties are required to be applied to predicted noise levels where the noise could contain characteristics which are considered annoying. Where the receiver noise environment is predicted to be controlled by noise sources from the subject site which have impulsive, tonal, modulating amplitude and/or low frequency noise characteristics, these penalties have been applied and are noted as such in the reported results.

Potential noise character from the Proposed Development is discussed below.

It is not typical for concrete batching plants to emit noise of low frequency or impulsive nature. However, amplitude modulation and tonal noise character can be audible in some instances.

For the Proposed Development, the nearest noise sensitive receivers are located 200-300 metres from the site, and in an area where a number of existing amplitude-modulating noises are already present (such as vehicle movements at an existing concrete batching plant in the area and traffic movements on the South Eastern Freeway). As such, a noise character penalty for amplitude modulation is not applicable

Tonal sounds can be a characteristic of noise from industrial sites where heavy vehicles and equipment operate. Tonal character is most often associated with reverse alarms (beepers) or warning alarms. To avoid tonal noise emissions (and the application of a +5dBA character penalty), the following will be applied:

- Movement of heavy vehicles on sites will minimise reversing, with a forward in, forward out vehicle pathway adopted where possible.
- Permanent vehicles associated with the site (e.g. agitator trucks, front end loaders) will be fitted with broadband reverse alarms (reverse squawkers) instead of tonal reverse alarms (reverse beepers)
- The use of audible warning alarms (such as sirens) will be avoided under regular operation of the concrete batching equipment

It is noted that eliminating tonal noise emissions entirely is not likely to be possible, particularly from delivery trucks visiting the site and reversing for short periods of time. However, with the above controls in place, tonal noise emissions will not be a routinely audible characteristic of noise observed during regular operation of the Proposed Development. As such, a penalty for tonal noise character has not been applied to predicted noise levels from the site.

5 RESULTS WITHOUT MITIGATION

This section provides predicted noise levels from the Proposed Development without the provision of specific noise mitigation.

Predicted noise levels at the noise sensitive receiver locations are provided in Table 5.1 for the day period, and Table 5.2 for the night period.

Table 5.1 Predicted future day period noise levels

RECEIVER LOCATION	PREDICTED L_{EQ} NOISE LEVEL [dB(A)]	DAY PERIOD NOISE CRITERIA [dB(A)]	COMPLIANT WITH CRITERIA
R01	41	51	Yes
R02	39	50	Yes
R03	37	50	Yes
R04	49	50	Yes
R05	49	50	Yes
R06	47	50	Yes
R07	36	47	Yes
S01	47	57	Yes

Noise levels are compliant with the noise criteria for all receivers during the day period.

Table 5.2 Predicted future night period noise levels

RECEIVER LOCATION	L_{EQ}			L_{MAX}		
	PREDICTED NOISE LEVEL [dB(A)]	NOISE CRITERIA [dB(A)]	COMPLIANT WITH CRITERIA	PREDICTED NOISE LEVEL [dB(A)]	NOISE CRITERIA [dB(A)]	COMPLIANT WITH CRITERIA
R01	41	44	Yes	N/A	N/A	N/A
R02	40	43	Yes	47	60	Yes
R03	38	43	Yes	45	60	Yes
R04	**50**	43	**No**	58	60	Yes
R05	**49**	43	**No**	57	60	Yes
R06	**47**	43	**No**	56	60	Yes
R07	37	40	Yes	42	60	Yes
S01	48	50	Yes	N/A	N/A	N/A

During the night period, three receivers are predicted to receive noise levels which exceed the night time L_{eq} criterion without the provision of noise mitigation. There are no receivers predicted to exceed the L_{max} criterion.

6 NOISE MITIGATION

Noise mitigation will be required to achieve compliance with the noise criteria for Site operation the night time period.

Based upon discussions with Holcim, it is understood that the site can operate without concrete tanker or quarry aggregate deliveries during night hours. A noise model scenario was run without these sources present for night conditions. Results from this model scenario are provided in Table 6.1.

A noise contour plot for the day and night period scenarios is provided in Appendix C.

Table 6.1 Predicted future night period noise levels

RECEIVER LOCATION	L_{EQ}			L_{MAX}		
	PREDICTED NOISE LEVEL [dB(A)]	NOISE CRITERIA [dB(A)]	COMPLIANT WITH CRITERIA	PREDICTED NOISE LEVEL [dB(A)]	NOISE CRITERIA [dB(A)]	COMPLIANT WITH CRITERIA
R01	36	44	Yes	N/A	N/A	N/A
R02	33	43	Yes	39	60	Yes
R03	33	43	Yes	37	60	Yes
R04	39	43	Yes	43	60	Yes
R05	39	43	Yes	43	60	Yes
R06	39	43	Yes	46	60	Yes
R07	35	40	Yes	42	60	Yes
S01	45	50	Yes	N/A	N/A	N/A

These results indicate that without concrete tanker or aggregate truck deliveries outside the hours of 07:00-22:00, noise from the site is compliant with the Noise Policy criteria.

Therefore, with this operational noise mitigation strategy in place, the Proposed Development satisfies PDC 8 of the *Interface Between Land Uses* section of the Mount Barker District Council Development Plan.

Furthermore, the layout of the Proposed Development incorporates on-site noise attenuation/mitigation measures such as retaining walls and fences, and locates these between significant noise sources and the nearest noise sensitive receivers to provide acoustic shielding. This is in accordance with PDC 9 of the *Interface Between Land Uses* section of the Mount Barker District Council Development Plan.

Overall, WSP is of the opinion that the Proposed Development will not detrimentally affect the acoustic amenity of the locality, and as such will be compliant with PDC 1(b) of the *Interface Between Land Uses* section of the Mount Barker District Council Development Plan.

7 CONCLUSION

WSP has undertaken a Development Authorisation Acoustic Assessment of the proposed Holcim Littlehampton Concrete Plant.

Measurements and observations of the existing noise environment were undertaken, and a noise model developed for future operations of the Proposed Development.

Noise modelling has shown that noise levels from the Proposed Development are predicted to comply with the requirements of the SA EPA *Environment Protection (Noise) Policy 2007,* for both daytime and night time operation. This is subject to delivery of raw materials (including cement and aggregates) only occurring between the hours of 07:00-22:00 daily. All other proposed site activities are acceptable during both the day and night periods.

It has been demonstrated that the Proposed Development is compliant with the noise-related provisions of the relevant Development Plan and will not have a detrimental effect on acoustic amenity of nearby noise sensitive receivers.

APPENDIX A

EQUIPMENT CALIBRATION CERTIFICATES

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 26175 & FILT 5589

Equipment Description:	Sound Level Meter		
Manufacturer:	NTI Audio		
Model No:	XL2-TA	**Serial No:**	A2A-13461-E0
Microphone Type:	MC230	**Serial No:**	A14410
Preamplifier Type:	MA220	**Serial No:**	6912
Filter Type:	1/3 Octave	**Serial No:**	A2A-13461-E0
Comments:	All tests passed for class 1. (See over for details)		
Owner:	WSP Australia Pty Ltd Level 1, 1 King William Street Adelaide, SA 5000		
Ambient Pressure:	994 hPa ±1.5 hPa		
Temperature:	24 °C ±2° C	**Relative Humidity:**	66% ±5%
Date of Calibration:	16/01/2020	**Issue Date:**	16/01/2020
Acu-Vib Test Procedure:	AVP10 (SLM) & AVP06 (Filters)		

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....
Jack Kielt

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to

NATA
WORLD RECOGNISED ACCREDITATION

Accredited Lab. No. 9262
Acoustic and Vibration Measurements

ACU-VIB
ELECTRONICS

HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

CERTIFICATE NO.: SLM 26175 & FILT 5589

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013

Tests Performed:	*Clause*	*Result*
Absolute Calibration	10	Pass
Acoustical Frequency Weighting	12	Pass
Self Generated Noise	11.1	Entered
Electrical Noise	11.2	Entered
Long Term Stability	15	Pass
Electrical Frequency Weightings	13	Pass
Frequency and Time Weightings	14	Pass
Reference Level Linearity	16	Pass
Range Level Linearity	17	Pass
Toneburst	18	Pass
Peak C Sound Level	19	Pass
Overload Indicator	20	Pass
High Level Stability	21	Pass

Statement of Compliance: The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC61672-1:2013.
A full technical report is available if required.

This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 1260: 1995 and AS/NZS 4476 - 1997 and were conducted to test the following performance characteristics:

1. Relative attenuation clause 5.3

Date of Calibration: 16/01/2020 **Issue Date:** 16/01/2020

Checked by:

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
WORLD RECOGNISED ACCREDITATION
Accredited Lab. No. 9262
Acoustic and Vibration Measurements

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APPENDIX B

NOISE CRITERIA DERIVATION

NOISE CRITERIA DERIVATION

Noise criteria for the project are derived from the Indicative Noise Levels determined in accordance with Part 1 Clause 5 of the Noise Policy. Separate criteria are provided for the day and night periods; the day period refers to the time between 7am and 10pm, and the night period from 10pm to 7am.

These Indicative Noise Levels are $L_{eq,15min}$ noise levels which are calculated from the Indicative Noise Factors determined based on the uses principally promoted by the relevant Development Plan for each of the source and receiver locations.

The Indicative Noise Factors from the Noise Policy are presented in Noise Policy Table 1 and Table 2. Indicative Noise Factors are selected from Table 1 when both the noise source and noise-affected premises fall within one of the two specified industrial land uses, otherwise Table 2 is used.

Noise Policy Table 1

LAND USE CATEGORY	INDICATIVE NOISE FACTOR [dB(A)]	
	DAY	NIGHT
General Industry	65	65
Special Industry	70	70

Noise Policy Table 2

LAND USE CATEGORY	INDICATIVE NOISE FACTOR [dB(A)]	
	DAY	NIGHT
Rural living	47	40
Residential	52	45
Rural Industry	57	50
Light Industry	57	50
Commercial	62	55
General Industry	65	55
Special Industry	70	60

Figure B.1 shows the zoning of the Site and surrounding noise sensitive receivers.

Figure B.1 Development Plan Zoning in the vicinity of the Proposed Development

Indicative Noise Levels were derived in accordance with Part 1, Clause 5 of the Noise EPP.

The Proposed Development is located within a Light Industry Zone. For this Zone, the Development Plan promotes light industrial land uses such as warehousing. It is considered that the Noise Policy's 'Light Industry' Land Use Category is applicable to this locality.

Receiver R01 is located within a Rural Landscape Protection Zone. For this zone, the principally promoted land uses are rural/agriculture land uses and small scale detached dwellings associated with farming. It is considered that the 'Residential' and 'Rural Industry' Land Use Categories are equally applicable to this locality.

Receivers R02-R07 are located in Residential Zones. The land use principally promoted for these zones are residential in nature, and it is considered that the Noise Policy's 'Residential' Land Use Category is applicable for receivers in these localities.

Receiver S01 is located in a Community Zone. For this zone, the land uses promoted include community centres, health facilities, public buildings, and educational institutions. It is considered that the 'Commercial' Land Use Category from the Noise Policy is applicable to receivers in this locality.

The Noise Policy in Clause 5 states:

> "*(4) If the land uses principally promoted by the relevant Development Plan provisions for the noise source and those principally promoted by the relevant Development Plan provisions for the noise-affected premises all fall within a single land use category, the indicative noise level for the noise source is the indicative noise factor for that land use category.*
>
> *(5) Subject to subclause (6), if the land uses principally promoted by the relevant Development Plan provisions for the noise source and those principally promoted by*

the relevant Development Plan provisions for the noise-affected premises do not all fall within a single land use category, the indicative noise level is the average of the indicative noise factors for the land use categories within which those land uses fall.

(6) Subclause (5) does not apply if the locality in which the noise source is situated is separated from the locality in which the noise-affected premises are situated by another locality that is (on an imaginary straight line joining the noise source and the noise-affected premises) at least 100 metres wide, but instead subclause (4) applies as if the land uses principally promoted by the relevant Development Plan provisions for the noise source were the same as those principally promoted by the relevant Development Plan provisions for the noise-affected premises."

For receivers R01-R06, Noise Policy Clause 5 Subclause (5) applies for determining Indicative Noise Levels. For receivers R07 and S01, the South Eastern Freeway acts as a separate locality between the source and receiver localities, and therefore Clause 5 Subclause (6) is applicable instead.

The derived Indicative Noise Levels for each of the receivers are summarised in Table B.1

Table B.1 Indicative Noise Levels

RECEIVER	INDICATIVE NOISE LEVEL [dBA]	
	DAY	NIGHT
R01	56	49
R02 – R06	55	48
R07	52	45
S01	62	55

For a Development Authorisation acoustic assessment, Part 5 of the Noise Policy sets the assessment noise criteria. Clause 20 Subclause (3) sets the noise criteria 5 dBA below the Indicative Noise Levels determined for the locality. Additionally, if the receiver location is in a residential area or similar determined as a 'Quiet Locality', a minimum level of 52/45 dBA (day/night) is applicable to the L_{Aeq} level, and an additional L_{Amax} noise criteria of 60 dBA is applicable during the night period.

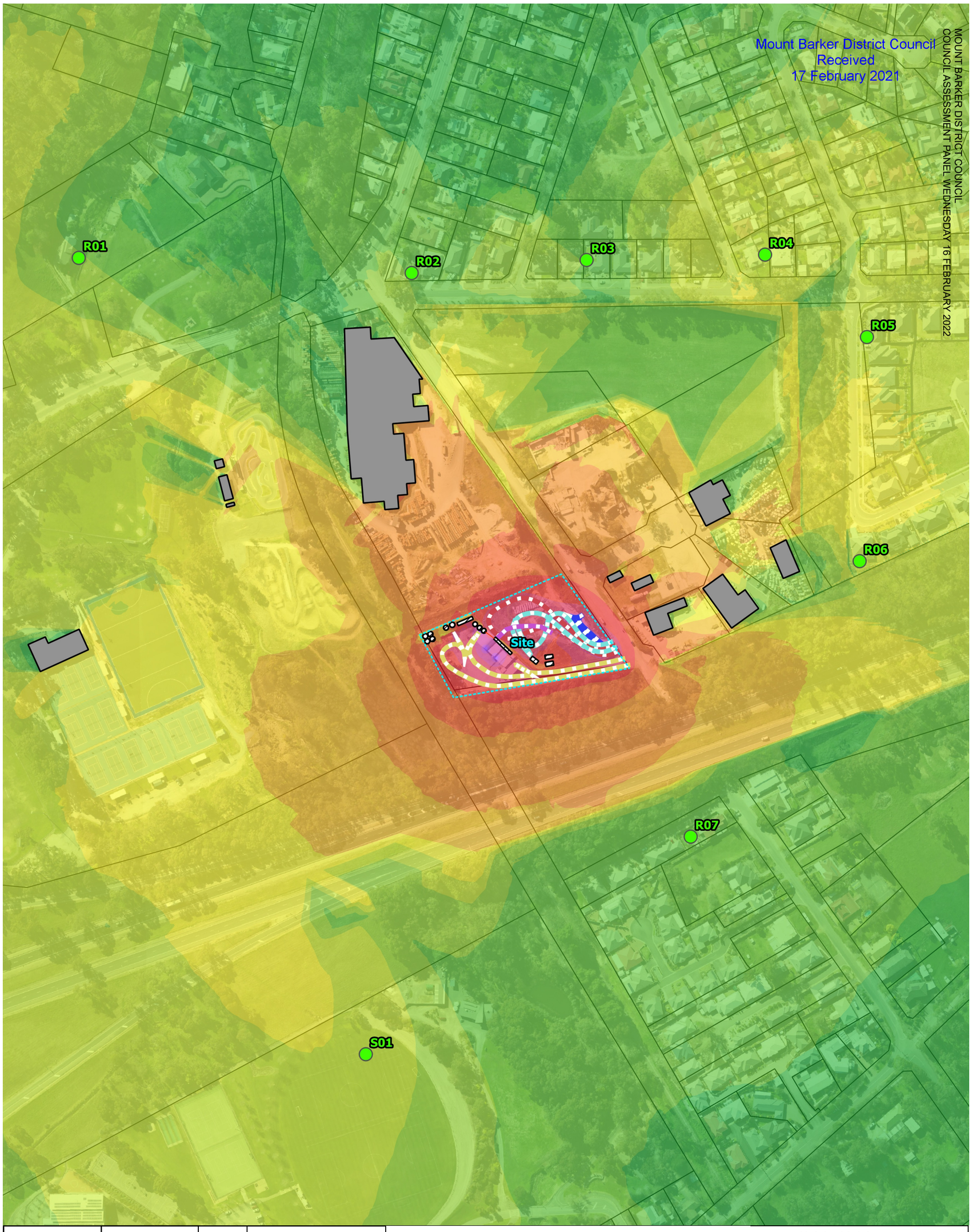
The resultant applicable noise criteria for the Proposed Development are summarised in Table B.2.

Table B.2 Noise Criteria

RECEIVER	NOISE CRITERIA [dBA]		
	DAY $L_{EQ,15MIN}$	NIGHT $L_{EQ,15MIN}$	NIGHT L_{MAX}
R01	51	44	N/A
R02 – R06	50	43	60
R07	47	40	60
S01	57	50	N/A

APPENDIX C

NOISE CONTOUR PLOTS



Map: C1	Author: AC	N
Date: 20/01/2021	Approved by: SM	

To be read in conjunction with WSP document: PS114434-ACO-REP-009

0 30 60 90 m

1:2,500 at A3

Coordinate system: GDA94, MGA zone 54

Aerial imagery source: Metromap 2020

Legend

- Site boundary
- Off-site buildings
- Site buildings
- Aggregates truck path
- Agitator truck path
- Concrete tanker path
- Front End Loader path
- Light vehicle path

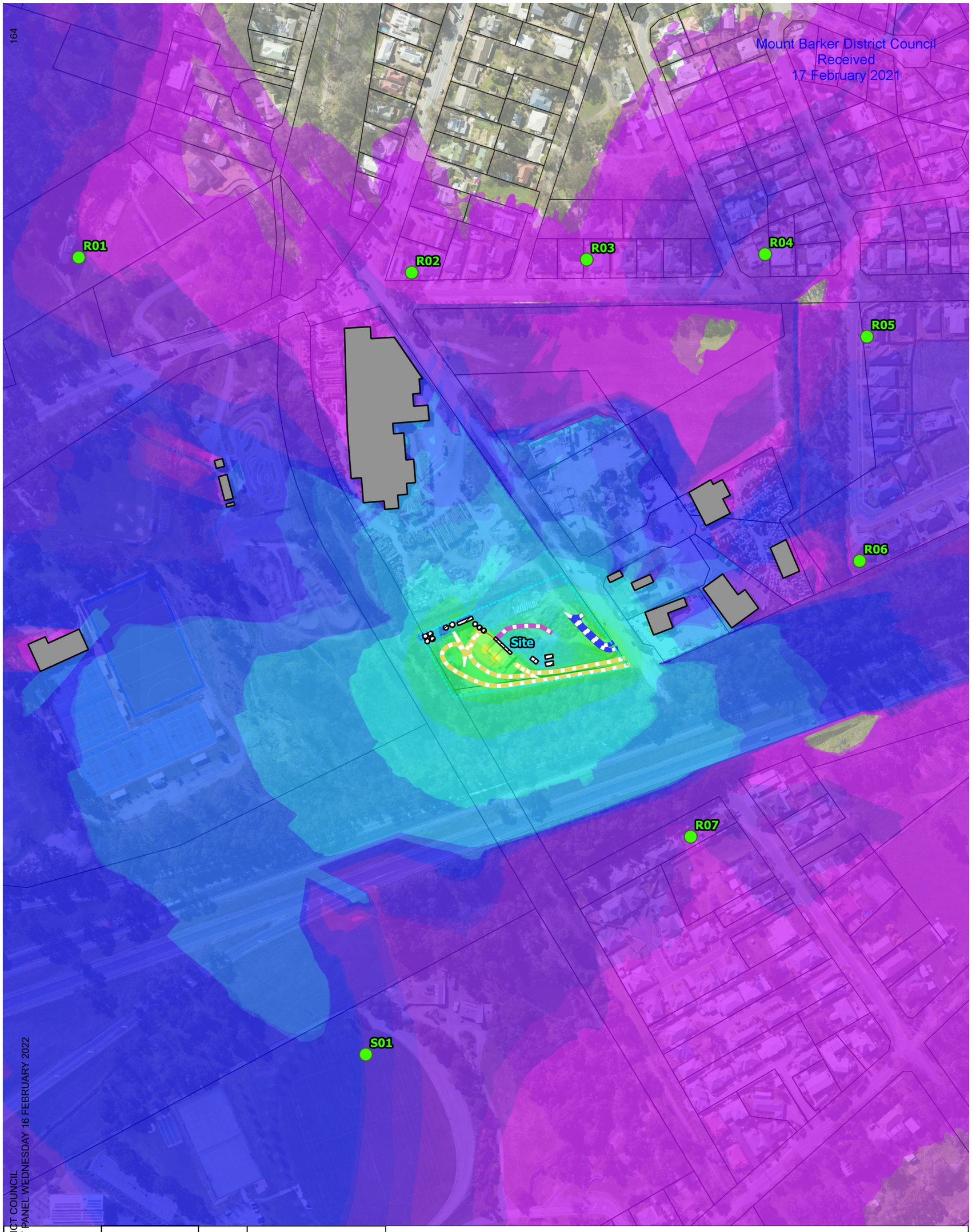
Noise level contours (Leq, dBA)

- 30.00
- 35.00
- 40.00
- 45.00
- 50.00
- 55.00
- 60.00
- 65.00
- 70.00
- 75.00
- 80.00
- 85.00
- 90.00

Holcim Littlehampton
Proposed Concrete Plant

Noise contours:
Predicted daytime noise levels (Leq)

wsp



JOINT PLANNING BOARD FOR DISTRICT COUNCIL
OF MOUNT BARKER COUNCIL ASSESSMENT PANEL WEDNESDAY 16 FEBRUARY 2022

Map: C2	Author: AC	N
Date: 2/12/2021	Approved by: SM	

To be read in conjunction with WSP document: PS114434-ACO-REP-009

0 30 60 90 m

1:2,500 at A3

Coordinate system: GDA94, MGA zone 54

Aerial imagery source: Metromap 2020

Legend

- Site boundary
- Off-site buildings
- Site buildings

Noise level contours (Leq, dBA)

- 30.00
- 35.00
- 40.00
- 45.00
- 50.00
- 55.00
- 60.00
- 65.00
- 70.00
- 75.00
- 80.00
- 85.00
- 90.00

Holcim Littlehampton
Proposed Concrete Plant

Noise contours:
Predicted night time noise levels (Leq)

wsp

Attachment 6

Stormwater Management Plan

Attachment 7

Traffic Impact Assessment

TRAFFIC TRANSPORT plus

Littlehampton Concrete Batching Plant

TRAFFIC IMPACT ASSESSMENT REPORT

Prepared for: Holcim (Australia) Pty Ltd

Date:
February 2021

File Ref:
documents / 20210210_10378_TIA

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Project / Report Details

Document Title:	Littlehampton Concrete Batching Plant - Traffic Impact Assessment Report
Principal Author:	Margaret Mak
Client:	Holcim (Australia) Pty Ltd
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APPENDICES

1 Introduction

Traffic & Transport Plus (**TTPlus**) has been commissioned by Holcim (Australia) Pty Ltd (**Holcim**) to prepare a Traffic Impact Assessment (**TIA**) report as part of a development application for the proposed Littlehampton Concrete Batching Plant (**CBP**) located at the southern end of 2 Childs Road, Littlehampton.

The proposed CBP is anticipated to commence operation in late 2021. For the purpose of this TIA, it is conservatively assumed that the proposed CBP would start operation in early 2022, and therefore adopting the traditional ten-year horizon planning approach, the design horizon year for the proposed CBP is 2032.

The demand for concrete follows economic cycles, so it is often difficult to provide definitive volume output estimates; however, in consideration of the potential future market for the subject proposal, Holcim has advised that the maximum annual production rate that will be sought in this application will be 30,000m^3 of concrete, which is ~70,000 tonnes per annum (**tpa**) (the **Proposal**).

An assessment of the operational impacts of the Proposal on the external road network has been undertaken using SIDRA intersection analysis software (**SIDRA**). As part of the SIDRA analysis, the assessment philosophy has included the concept of a "peak hour factor" (more information provided in Section 4.3), to provide additional surety that suitable infrastructure is in place at commencement of, and through the life of the Proposal, to cater for the likely 'worst-case-scenario' peak operating conditions of the Proposal. This methodology is considered to be a suitably conservative approach to the analysis.

This report addresses the following traffic-related issues:

- The transport routes;
- Additional trips (both heavy and light vehicles) associated with the Proposal;
- Traffic impacts on the adjacent external road network associated with the Proposal, and
- Safety issues on the adjacent external road network in consideration of the additional traffic generated by the Proposal.

A summary of findings is provided in Section 6.

2 Subject Site

The Littlehampton CBP is proposed to be located at the southern end of the property at 2 Childs Road, Littlehampton (**Subject Site** - outlined in yellow on Figure 2-1). The Subject Site is split into two sections – an upper level and a lower level. 2 Childs Road (outlined in red on Figure 2-1) is currently occupied by an existing brickworks operation – Littlehampton Bricks and Pavers, which has operated for over 100 years.

The Subject Site is within the Light Industry Zone in the Mount Barker District Council (**MBDC**) jurisdiction. The upper level of the Subject Site (refer to Figure 2-1) is currently occupied by a portion of the existing brickworks operation. The portion of the existing brickworks operation that is located on the upper level of the Subject Site will be demolished for the purpose of the Proposal. The lower level is currently occupied by an asphalt plant and will also be demolished for the purpose of the Proposal.

Due to the two levels of the Subject Site, two site accesses are proposed to be provided on Childs Road, as illustrated on Figure 2-1. Both site accesses would be located at the southern end of Childs Road – it is noted that Childs Road is a no-through road. Site plans for the Proposal are included within **Appendix A**.

Figure 2-1 illustrates the location of the Subject Site relative to Childs Road, the Old Princes Highway (North Terrace), Adelaide Road and the South Eastern Freeway (Princes Highway). Childs Road is a Council-controlled road; whilst the Old Princes Highway (North Terrace), Adelaide Road and the South Eastern Freeway are controlled by the Department for Instructure and Transport (**DIT**). The MBDC road hierarchy plan is duplicated as Figure 2-2. There is a railway line to the west of the Subject Site running in a predominately north-south direction, as illustrated on Figure 2-2.

The posted speed limit of the Old Princes Highway is 50 km/h. There is no posted speed limit on Childs Road – accordingly, the speed limit for Childs Road has been assumed to be 50 km/h (according to *Speed Limit Guidelines for South Australia*, the default urban speed limit is 50km/h).

Figure 2-1 – Locality Map
Source: Nearmap [annotations and road names added by TTPlus]

There are MBDC infrastructure projects (2020/2021) in the vicinity of the Subject Site, which includes Anembo Park Access Trail and Childs Road Stage 1 Trail. Discussions with a MBDC officer have confirmed that the trails related to these projects are off-road and would have no bearing on the existing pavement / road widths of the Old Princes Highway and Childs Road. The locations of the MBDC infrastructure projects are illustrated on Figure 2-2.

MBDC also plans to upgrade the Old Princes Highway / Childs Road intersection, and the MBDC strategic infrastructure team has advised the following in relation to the upgrade the Old Princes Highway / Childs Road intersection:

> *"… only a preliminary design process that is being done by Council. There is no scheduled timeframe for an upgrade at this time (noting that this is a DIT asset). As such, there is no information available to be forwarded at this time."*

TTPlus has also been advised that the development application of the Adelaide Hills Business Park has been approved by MBDC (not yet constructed). The location of the Adelaide Hills Business Park is illustrated on Figure 2-1.

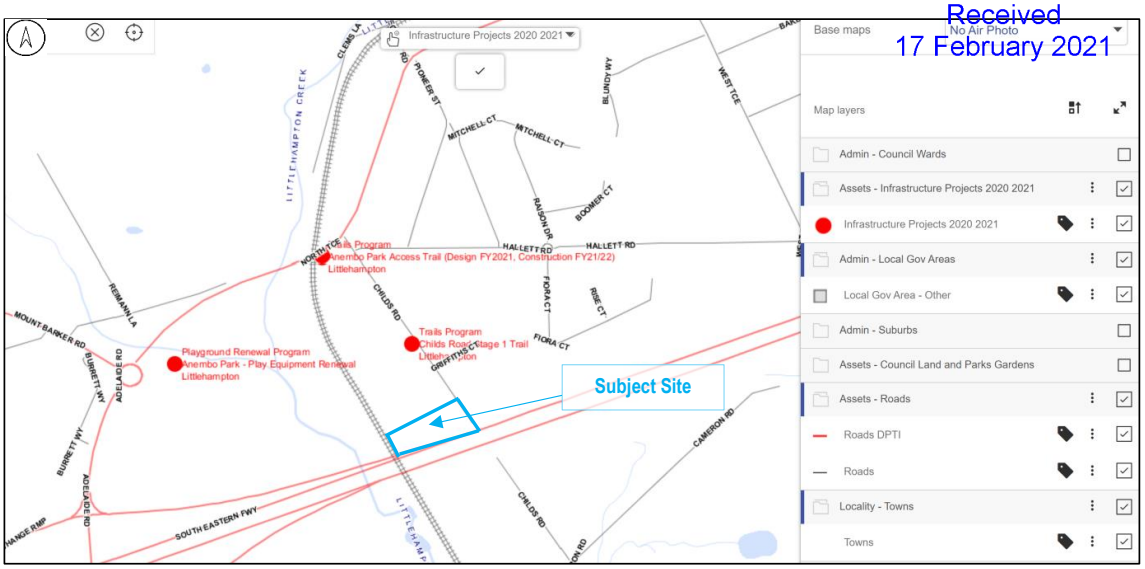


Figure 2-2 – Mount Barker District Council Road Hierarchy and Infrastructure Projects

Source: https://maps.mountbarker.sa.gov.au [blue annotations added by TTPlus]

3 The Transport Routes

Holcim has advised that the majority of the material from the CBP will be hauled to Adelaide Hills, Mount Barker and other surrounding areas.

The proposed transport routes have been illustrated on Figure 3-1 and are detailed below:

- To / from Mount Barker and surrounding areas
  - via Childs Road, the Old Princes Highway and Adelaide Road.
- To / from Adelaide Hills and surrounding areas
  - via Childs Road, the Old Princes Highway and the South Eastern Freeway.

Figure 3-1 – Transport Routes of the Proposal
Source: Google Earth [transport routes and road names added by TTPlus]

4 Traffic Volumes

4.1 2020 Traffic Volumes

To assist in the preparation of this assessment, determination of background traffic volumes was required. A traffic survey was undertaken at the Old Princes Highway / Childs Road intersection on Wednesday 9 December 2020 from 6:30am to 9:30am and from 2:30pm to 6:00pm. The location of the traffic survey is illustrated on Figure 4-1.

The detailed results of the traffic survey are included in this report, within **Appendix D**.

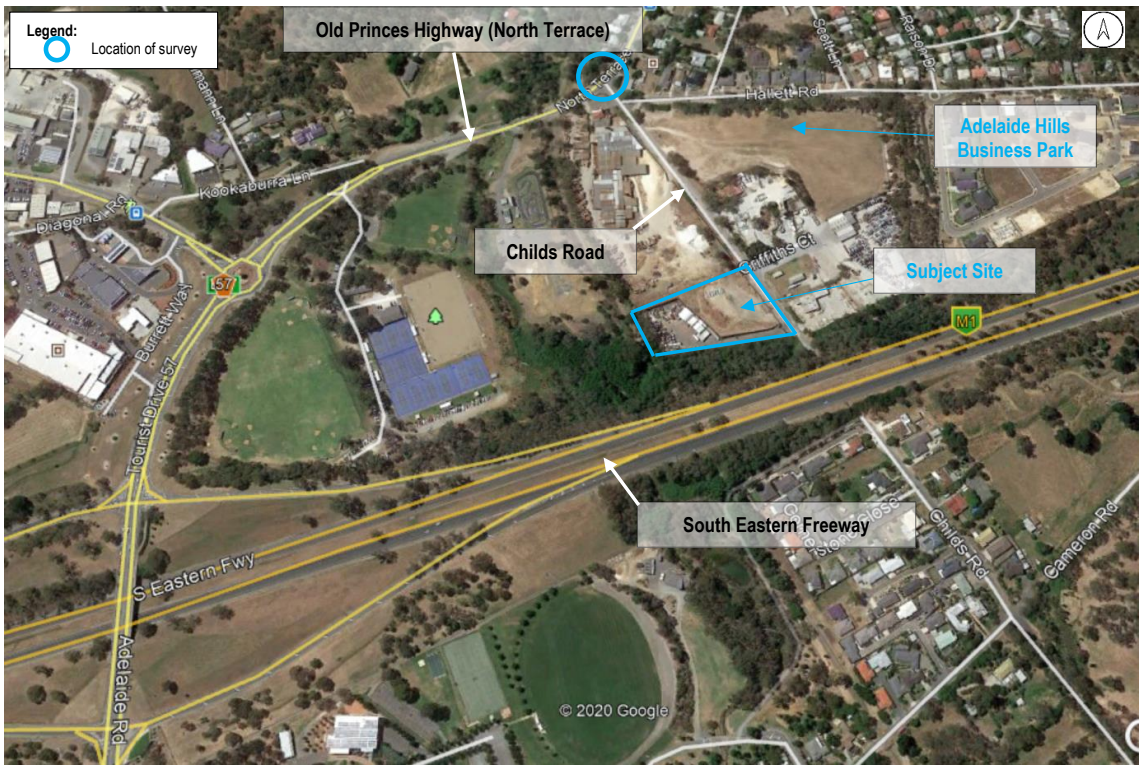


Figure 4-1 – Location of Traffic Survey
Source: Google Earth [Survey location and annotations added by TTPlus]

The observed AM and PM peak hour periods were identified as being 8:00am to 9:00am and 4:15pm to 5:15pm .

Figure B1 within **Appendix B** illustrates the 2020 observed AM and PM peak hourly traffic volumes.

4.2 Base Traffic Volumes

4.2.1 Trips generated by the approved development

As discussed previously, the development application of the Adelaide Hills Business Park has been approved by MBDC, but has not yet been constructed. The lot plan of the Adelaide Hills Business Park, duplicated as Figure 4-2, has been found on the website of www.realcommercial.com.au – the website states that the Adelaide Hills Business Park could be for commercial office, research and development style business and / or leisure/sports facility uses. The total lot area of the Adelaide Hills Business Park is ~26,773m^2.

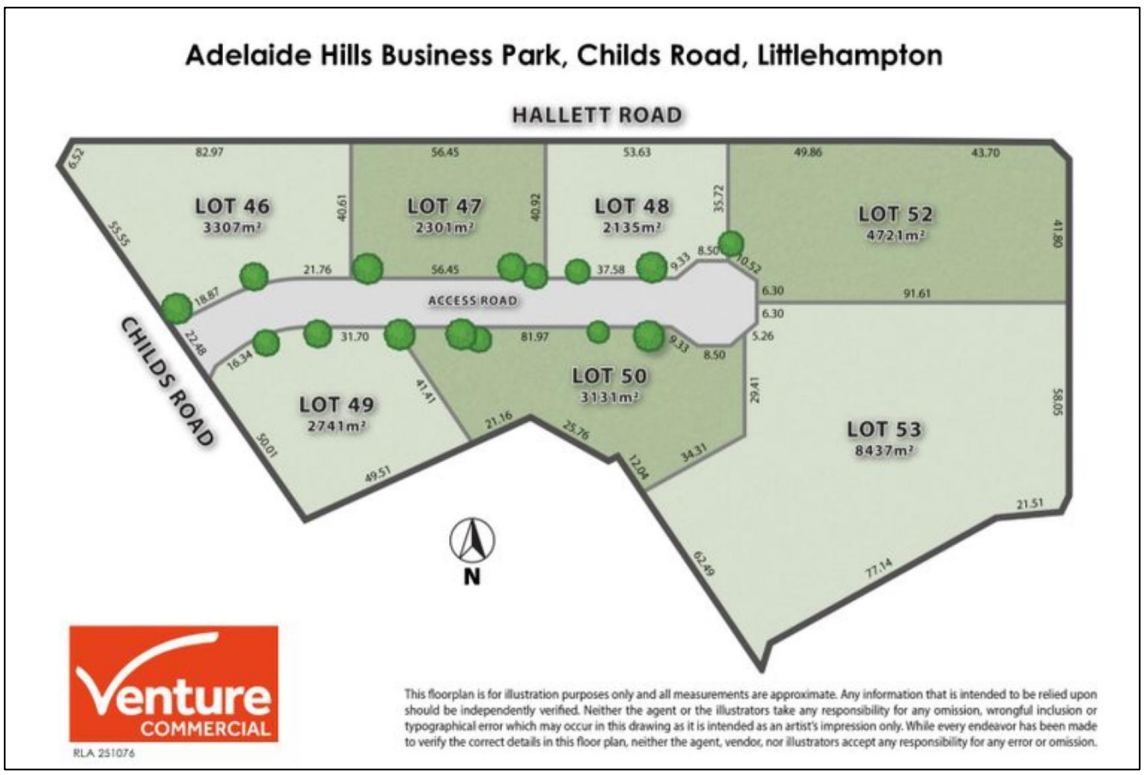


Figure 4-2 – Lot Plan of the Adelaide Hills Business Park
Source: www.realcommercial.com.au/for-sale/property-adelaide-hills-business-park-1-childs-road-littlehampton-sa-5250-502796042

To estimate base future traffic volumes on the road network in the vicinity of the Subject Site, it is required to estimate the trips associated with the future Adelaide Hills Business Park. For the purpose of estimating the trips associated with the Adelaide Hills Business Park, it has been conservatively assumed that the Adelaide Hills Business Park will be entirely office use.

Applying a typical plot ratio of 0.5, the gross floor area (**GFA**) of the Adelaide Hills Business Park has been estimated to be ~13,387m^2. RTA's guideline (Ref.1) recommends a weekday peak hourly trip generation rate of 1.6 vehicles per hour (**vph**) / 100m^2 GFA in the AM peak hour and 1.2vph / 100m^2 GFA in the PM peak hour for office use. On this basis, the Adelaide Hills Business Park would generate approximately 214vph and 161vph during the AM and PM peak hour periods, respectively.

Directional splits of 70% IN / 30% OUT during the AM peak hour period and 30% IN / 70% OUT during the PM peak hour period have been adopted for the trips associated with the the Adelaide Hills Business Park.

[1] *"Guide to Traffic Generating Developments, Updated Traffic Survey", RTA, August 2013.*

On the basis of the above directional splits, the peak hourly traffic volumes likely to be generated by the Adelaide Hills Business Park would be in the order of:

- Weekday AM Peak Hour: 150vph IN + 64vph OUT = 214vph TOTAL, and
- Weekday PM Peak Hour: 48vph IN + 113vph OUT = 161vph TOTAL.

Based on a review of the surrounding road network, it is estimated that 80% of trips generated by the Adelaide Hills Business Park would travel to / from the Old Princes Highway (west); and 20% would travel to / from the Old Princes Highway (east).

Figure B2 within **Appendix B** illustrates the AM and PM trips forecast to be generated by the Adelaide Hills Business Park.

It is unknown whether any works at the Old Princes Highway / Childs Road intersection have been conditioned.

4.2.2 Background traffic growth

The first operational year of the proposed CBP is assumed to be 2022, and therefore adopting the traditional ten-year horizon planning approach, the design horizon year for the Proposal is 2032.

For the purpose of this TIA, a growth rate of 3.0% p.a. (compound) has been adopted to estimate the future background traffic volumes of the Old Princes Highway without the trips associated with the proposed CBP and Adelaide Hills Business Park. It is assumed that the growth rate of Childs Road is zero without the proposed CBP and Adelaide Hills Business Park.

The 2022 base traffic volumes (without the proposed CBP) are calculated as follows:

[**Figure B3**] = 2020 observed traffic volumes [**Figure B1**] x $(1 + \text{growth rate\%})^2$ + Trips associated with the Adelaide Hills Business Park [**Figure B2**]

The 2032 base traffic volumes (without the proposed CBP) are calculated as follows:

[**Figure B4**] = 2020 observed traffic volumes [**Figure B1**] x $(1 + \text{growth rate\%})^{12}$ + Trips associated with the Adelaide Hills Business Park [**Figure B2**]

It is understood that the lower level of the Subject Site (refer to Figure 2-1) is currently an asphalt plant but will be demolished for the purpose of the Proposal. For the purpose of this assessment, the trips associated with the current asphalt plant have not been excluded from the base traffic volumes, which is considered to be a conservative assumption.

4.3 Trip Generating Characteristics of the CBP

TTPlus has been advised that the haulage activities of the proposed CBP are being sought to be permitted 7 days per week and 24 hours a day, however the vast majority of haulage would occur from 5:00am to 5:00pm (Monday – Friday) and 5:00am to 12:00pm (Saturday).

CBP - Outgoing Material

The truck trips generated by the outgoing material of the proposed CBP have been estimated by adopting the following project operational parameters:

- Maximum annual production rate: 70,000 tpa;
- Working weeks per year: 50 weeks;
- Working days per week*: 5.6 days (= 5 + 7 / 12);
- Working hours per day*: 12 hours;
- Weighted average mass per vehicle**: 13 tonnes per vehicle;
- Average daily truck volumes (IN): 70,000 / 50 / 5.6 / 13 = 19.2vpd → 19vpd;
- Average daily truck volumes (OUT): 19vpd (assumed same as IN traffic volumes);
- Peak hour factor***: 3;
- Peak hour traffic volume (IN): 70,000 / 50 / 5.6 / 13 / 12 x 3 = 4.8vph → 5vph, and
- Peak hour traffic volume (OUT): 5vph (assumed same as IN traffic volumes).

**TTPlus has been advised that although the approval being sought for the CBP will be 7 days per week and 24 hours a day, the majority of the material will be hauled from 5:00am to 5:00pm from Monday to Friday; and from 5:00am to 12:00pm on Saturday.*
***TTPlus has been advised that 13t payload agitator concrete trucks will primarily be used to transport the outgoing concrete.*
****The peak hour factor is the ratio of the absolute peak operating conditions to the average operating conditions of a peak production year, as modelled for the Subject Site. This represents what is considered to be the 'worst-case' peak operational scenario and accounts for all aspects of variations expected throughout each day and the year.*

As discussed previously, the majority of the outgoing material from the CBP will be hauled to Adelaide Hills, Mount Barker and other surrounding areas (ie. hauled via the Old Princes Highway (west of Childs Road)).

CBP - Incoming Material

The proposed CBP also requires the importation of raw materials such as cement, sand and aggregate to produce the concrete.

The truck trips generated by the incoming material of the proposed CBP on the external road network have been estimated by adopting the following project operational parameters:

- Maximum incoming material per annum: 70,000 tpa (via the external road network);
- Working weeks per year: 50 weeks;
- Working days per week*: 5.6 days;
- Working hours per day*: 12 hours;
- Weighted average mass per vehicle**: 38.3 tonnes per vehicle;
- Average daily truck volume (IN): 70,000 / 50 / 5.6 / 38.3 = 6.5vpd → 7vpd;
- Average daily truck volume (OUT): 7vpd (assumed same as IN traffic volumes);
- Peak hour factor***: 3;
- Peak hourly truck volume (IN): 70,000 / 50 / 5.6 / 38.3 / 12 x 3 = 1.6vph → 2vph, and
- Peak hourly truck volume (OUT): 2vph (assumed same as IN traffic volumes).

**TTPlus has been advised that although the approval being sought for the CBP will be 7 days per week and 24 hours a day, the majority of the material will be hauled from 5:00am to 5:00pm from Monday to Friday; and from 5:00am to 12:00pm on Saturday.*
***TTPlus has been advised that 18t payload cement tankers (tandem truck) (5%), 28t payload cement tankers (5%) and 40t payload b-double (90%) would be used to transport incoming material. The average mass of material assumed to be transported per vehicle has been calculated by factoring the mass of material able to be transported by these vehicles and the relative proportions of them within the vehicle fleet. Therefore, the average mass of material per vehicle = [18t x 0.05 + 28t x 0.05 + 40t x 0.9] = 38.3 tonnes per vehicle.*
****The peak hour factor is the ratio of the absolute peak operating conditions to the average operating conditions of a peak production year, as modelled for the Subject Site. This represents what is considered to be the 'worst-case' peak operational scenario and accounts for all aspects of variations expected throughout each day and the year.*

TTPlus has been advised that the majority of the incoming material to the CBP will be hauled from the Old Princes Highway (west of Childs Road).

These resultant volume forecasts are considered to be appropriately conservative for the purpose of this assessment. It is also conservatively assumed within the modelling that the development peak (both concrete trips and raw material trips) and the on-road peak are concurrent. It is also noted that this 'worst-case' operational scenario is a design consideration only and is unlikely to occur as part of the actual day to day operations. The analysis methodology used is intended to ensure that sufficient infrastructure is provided in the vicinity of the site, to enable the safe and efficient operation of the surrounding road network.

CBP - Staff

TTPlus has been advised that there would be a total of 7-8 staff working at the proposed CBP (including truck drivers).

Staff and visitors would generally not arrive / leave the site during the AM and PM haulage peak periods; notwithstanding this, allowances of 3vph during the AM peak hour period (2vph IN + 1vph OUT) and 3vph during the PM peak hour period (1vph IN + 2vph OUT) have been included in the analysis. This is a conservatively high allowance for staff / visitor car trips coinciding with the development truck trip and on-road peak periods. The allowance for trips generated by staff and visitors (car trips) is in addition to the trips generated by the haulage activities (truck trips) of the CBP. It has been assumed that all the staff and visitors would travel to / from the site from / to the Old Princes Highway (west of Childs Road).

The peak hourly trips forecast to be generated by the proposed CBP are illustrated on Figure B5 within **Appendix B**.

4.4 Design Traffic Volumes

Adding the forecast "additional" peak hour trips generated by the proposed CBP [Figure B5] to the 2022 and 2032 base traffic volumes [Figures B3 and B4] yields the 2022 and 2032 design peak hour traffic volumes with the proposed CBP. These are illustrated on Figures B6 and B7 within **Appendix B**.

5 Traffic Impact Assessment and Safety Assessment

Future operation and safety of the Old Princes Highway / Childs Road intersection has been assessed. The following sections report the results of the analyses.

5.1 Intersection Performance

The modelled existing configuration of the Old Princes Highway / Childs Road intersection as assessed using SIDRA, is shown as Figure 5-1.

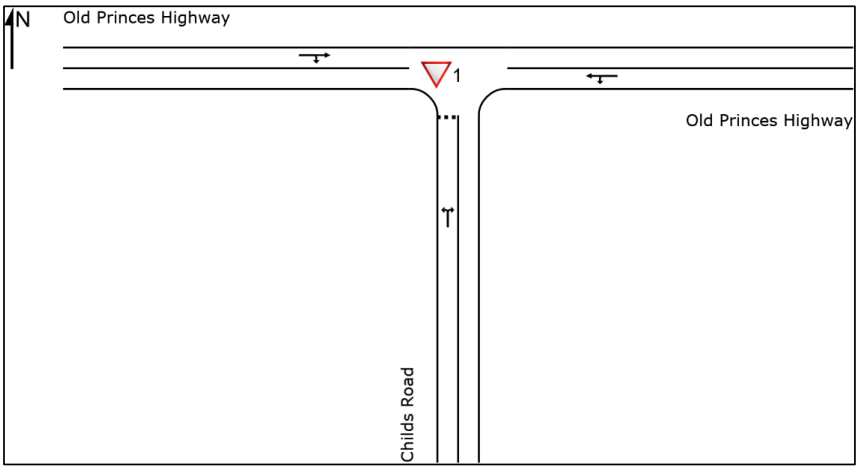


Figure 5-1 – Modelled Existing Configuration of the Old Princes Highway / Childs Road Intersection

Results from the analyses of the Old Princes Highway / Childs Road intersection for the base and design scenarios in 2022 (first operational year of the CBP) and in 2032 (10-year design horizon year) are summarised in Table 5-1 and Table 5-2.

Detailed SIDRA results are provided within Appendix C.

Table 5-1 – 2022 Operational Characteristics of the Old Princes Highway / Childs Road Intersection

Leg	Movement	2022 Base (without the Proposal)				2022 Design (with the Proposal)			
		AM		PM		AM		PM	
		Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)
Childs Road (South)	L	0.43	13	0.63	23	0.45	14	0.65	25
	R	0.43	13	0.63	23	0.45	14	0.65	25
Old Princes Highway (East)	L	0.51	0	0.33	0	0.51	0	0.33	0
	T	0.51	0	0.33	0	0.51	0	0.33	0
Old Princes Highway (West)	T	0.60	57	0.63	29	0.62	59	0.64	31
	R	0.60	57	0.63	29	0.62	59	0.64	31
Max. DOS	-	0.60	-	0.63	-	0.62	-	0.65	-

*Note: Practical Maximum Degree of Saturation (**DOS**) for a priority intersection is 0.80.*

Table 5-2 – 2032 Operational Characteristics of the Old Princes Highway / Childs Road Intersection

Leg	Movement	2032 Base (without the Proposal)				2032 Design (with the Proposal)			
		AM		PM		AM		PM	
		Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)	Degree of Sat (v/c)	95% Back of Queue (m)
Childs Road (South)	L	1.29	193	3.33	678	1.34	225	3.50	724
	R	1.29	193	3.33	678	1.34	225	3.50	724
Old Princes Highway (East)	L	0.67	0	0.44	0	0.67	0	0.44	0
	T	0.67	0	0.44	0	0.67	0	0.44	0
Old Princes Highway (West)	T	1.18	700	0.86	109	1.23	815	0.87	115
	R	1.18	700	0.86	109	1.23	815	0.87	115
Max. DOS	-	1.29	-	3.33	-	1.34	-	3.50	-

*Note: Practical Maximum Degree of Saturation (**DOS**) for a priority intersection is 0.80.*

The results provided in Table 5-1 and Table 5-2 indicate that the existing Old Princes Highway / Childs Road intersection as assessed would operate within satisfactory operating parameters in 2022 from a capacity viewpoint with and without the proposed CBP. However, it would not operate satisfactorily in 2032 with and without the proposed CBP.

The proposed CBP would only generate a ~1% and ~0.8% increase in traffic volumes at the Old Princes Highway / Childs Road intersection in 2022 and 2032, with the results provided in Table 5-1 and Table 5-2 showing that the performance of the Old Princes Highway / Childs Road intersection would only be marginally affected with the additional traffic generated by the proposed development. An oft-adopted guide with respect to the significance of impacts is when a development adds 5% or more traffic to an intersection, the impacts can be considered to be significant and more detailed investigations would be warranted.

Improvement works are required to be provided at the Old Princes Highway / Childs Road intersection at some stage in the future even without the subject proposal. The future capacity issues of the Old Princes Highway / Childs Road intersection are predominately due to the additional traffic likely to be generated by the Adelaide Hills Business Park and the background traffic growth.

If the Adelaide Hills Business Park proceeds slowly, then there would be reserve capacity at the intersection for some time.

As previously identified, MBDC plans to upgrade the Old Princes Highway / Childs Road intersection, however there is no concept plan or scheduled timeframe for the upgrade at this time. Based on the results provided in Table 5-1, the Old Princes Highway / Childs Road intersection would continue to operate satisfactorily (DOS < 0.8) for a number of years with the proposed CBP and (full development of) the Adelaide Hills Business Park – as noted, should the Adelaide Hills Business Park take some time to be fully developed, that timeframe would be extended. The realistic future growth rate in background traffic will potentially be less than the estimated 3%, which would also result in a longer period of acceptable operation.

Once MBDC upgrades the Old Princes Highway / Childs Road intersection, it is likely that the upgraded intersection would operate satisfactorily with the proposed CBP, as the proposed CBP would only generate a very small percentage increase in traffic volumes through the intersection (note – the net traffic impacts associated with the Proposal would be even smaller than that identified in the analyses in this report if the reduction of trips associated with the current asphalt plant (to be demolished for the purpose of the Proposal) had been included in the analyses.).

5.2 Safety Assessment

Whilst the previous section considers the operation of the Old Princes Highway / Childs Road intersection from a capacity viewpoint, safety of that intersection is also required to be assessed.

In consideration of safety, it is important to consider the appropriate geometry and location of the intersection. Safety considerations include consideration of the following features:

- Sight distances;
- Turn lane warrants;
- Crash data, and
- Any other relevant features.

In this instance, the sight distances on the Old Princes Highway are longer than the safe intersection sight distances and approach sight distances as per the requirements stated in Austroads' "*Guide to Road Design Part 4A: Unsignalised and Signalised Intersection, 2017*" and there are no other relevant features other than crash data and the need to consider the possible need for higher order turn lane treatments. These are considered below.

At this stage, TTPlus does not have any detailed information in relation to how MBDC plans to upgrade the Old Princes Highway / Childs Road intersection. Turn lane warrants would not be required to be assessed if the intersection would be converted into a signalised intersection. However, assuming the intersection continues to be a priority-controlled intersection after the MBDC improvement works, the appropriate turn lane treatments have been determined in the following section.

5.2.1 Turn Lane Treatments

TTPlus is not aware of any local guidance in relation to the possible need for provision of higher order turn lane treatments that may be required so as to manage safety risks in relation to crash rates at intersections. In this instance, consideration has been given to the methodology routinely adopted in Queensland for such scenarios. This section outlines the approach used, and results obtained.

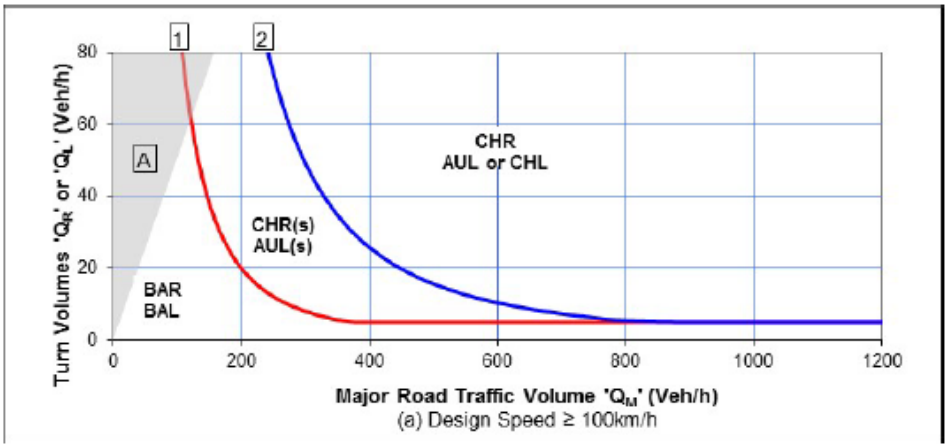
Considering the ultimate likely design traffic scenarios (2032 AM and PM base and design scenarios) ensures the warrants for the possible need to consider higher order turn lane treatments at the Old Princes Highway / Childs Road intersection are properly tested for all anticipated traffic conditions with and without the proposed CBP.

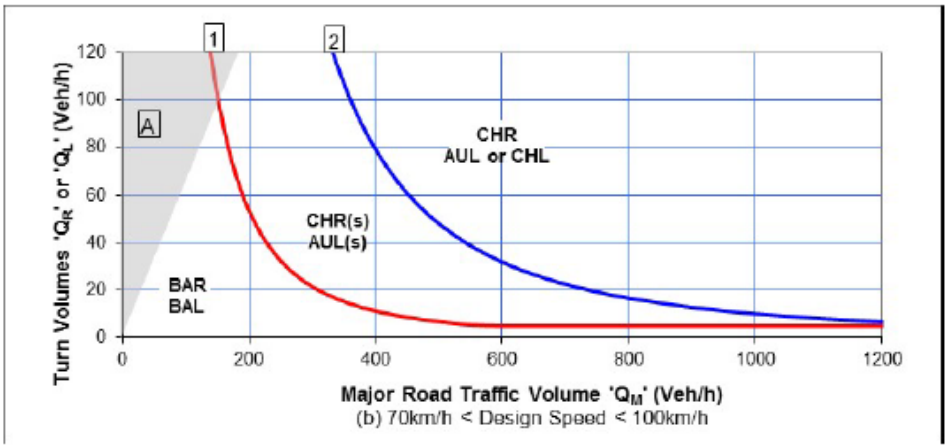
The turn lane treatments for Old Princes Highway / Childs Road intersection are determined by plotting the base and design traffic volumes on the graphs included as *Figure 4A-1 Warrants – Major Road Turn Treatments - Normal Design Domain* contained within the Department of Transport and Main Roads (**DTMR**) document "*Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections"* (Ref.2) duplicated as Figure 5- 2 of this report.

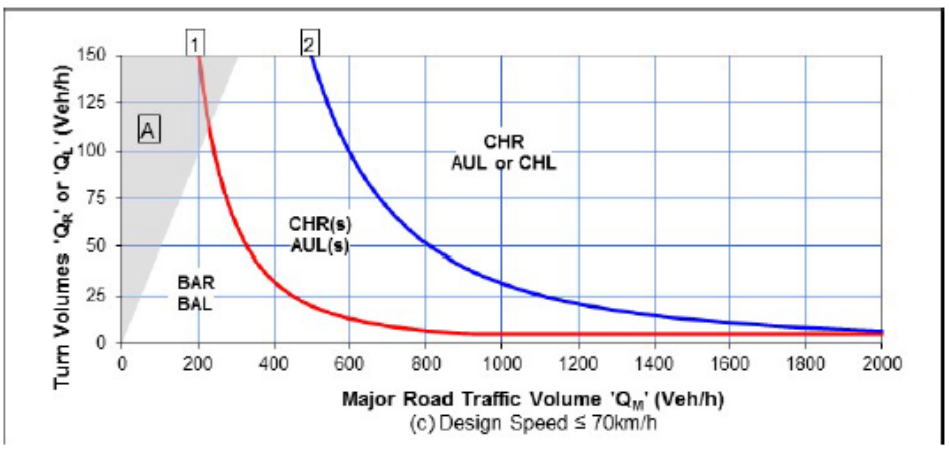
[2] "Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections, Road Planning and Design Manual – Edition 2: Volume 3", Department of Transport and Main Roads, August 2014.

Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

Figure 4A-1 - Warrants - major road turn treatments - Normal Design Domain







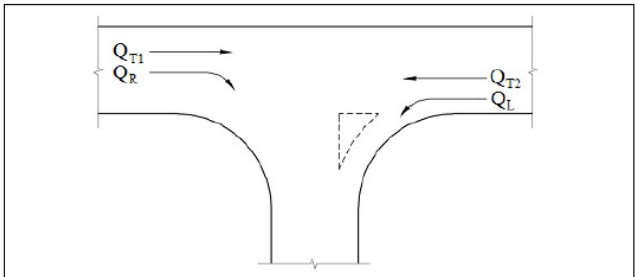
(*) the minimum right turn treatment for multi-lane roads is a CHR(s)

Figure 5-2 – Warrants for Turn Lane Treatments
(Source: Ref.2)

The x-axis (Q_M) and y-axis (Q_L and Q_R) on these graphs relate to the following:

- Q_R = Right turn traffic volume (vph);
- Q_L = Left turn traffic volume (vph), and
- Q_M = Major road traffic volume which is calculated in accordance with *Figure 4A-2 Calculation of the Major Road Traffic Volume Parameter 'Q_M'* (Ref.2), duplicated as Figure 5-3.

Figure 4A-2 - Calculation of the major road traffic volume parameter 'Q_M'



Road Type	Turn Type	Splitter Island	Q_M (veh/h)
2 Lane 2 Way	Right	No	= Q_{T1} + Q_{T2} + Q_L
		Yes	= Q_{T1} + Q_{T2}
	Left	Yes/No	= Q_{T2}
4 Lane 2 Way	Right	No	= 50% x Q_{T1} + Q_{T2} + Q_L
		Yes	= 50% x Q_{T1} + Q_{T2}
	Left	Yes/No	= 50% x Q_{T2}
6 Lane 2 Way	Right	No	= 33% x Q_{T1} + Q_{T2} + Q_L
		Yes	= 33% x Q_{T1} + Q_{T2}
	Left	Yes/No	= 33% x Q_{T2}

Figure 5-3 – Calculation of Major Road Traffic Volume Parameter 'Q_M'
(Source: Ref.2)

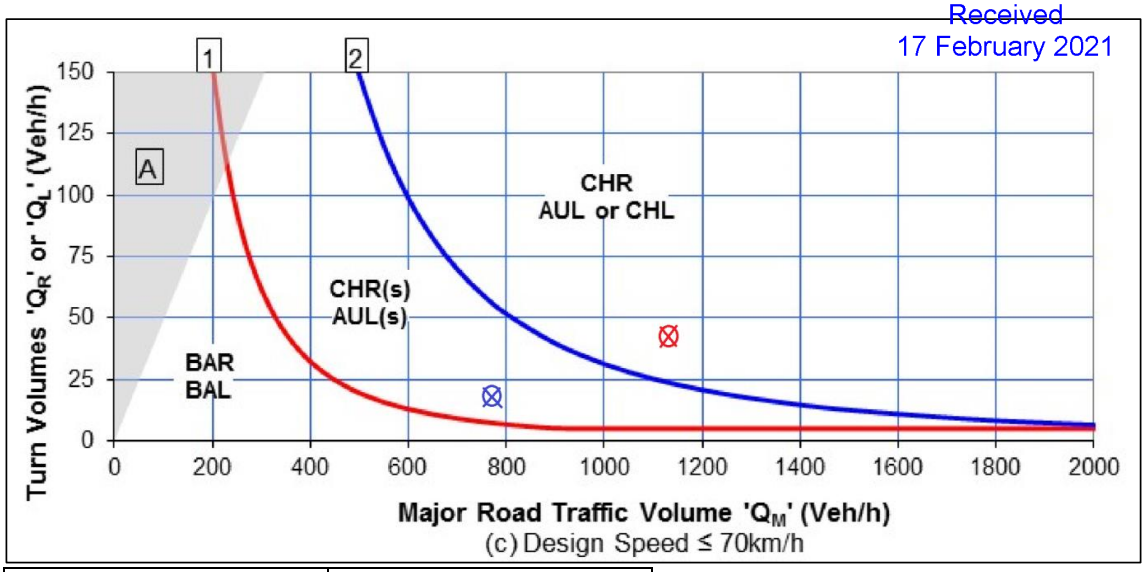
By applying the calculations indicated on Figure 5-3, the following relevant turn traffic volume parameters for the left turn, right turn and through movements for the 2032 AM and PM base and design scenarios were established. The traffic volume parameters for each assessment scenario are summarised in Table 5-3.

Table 5-3 – Traffic Volume Parameters – Old Princes Highway / Childs Road Intersection

Scenario	Traffic Movement	Traffic Volume (vph)			
		2032 Base (without the Proposal)		2032 Design (with the Proposal)	
		AM	PM	AM	PM
Left Turn Scenario	Q_L	43	20	43	20
	Q_{ML}	1156	766	1156	766
Right Turn Scenario	Q_L	160	103	169	111
	Q_{ML}	1775	2001	1775	2001

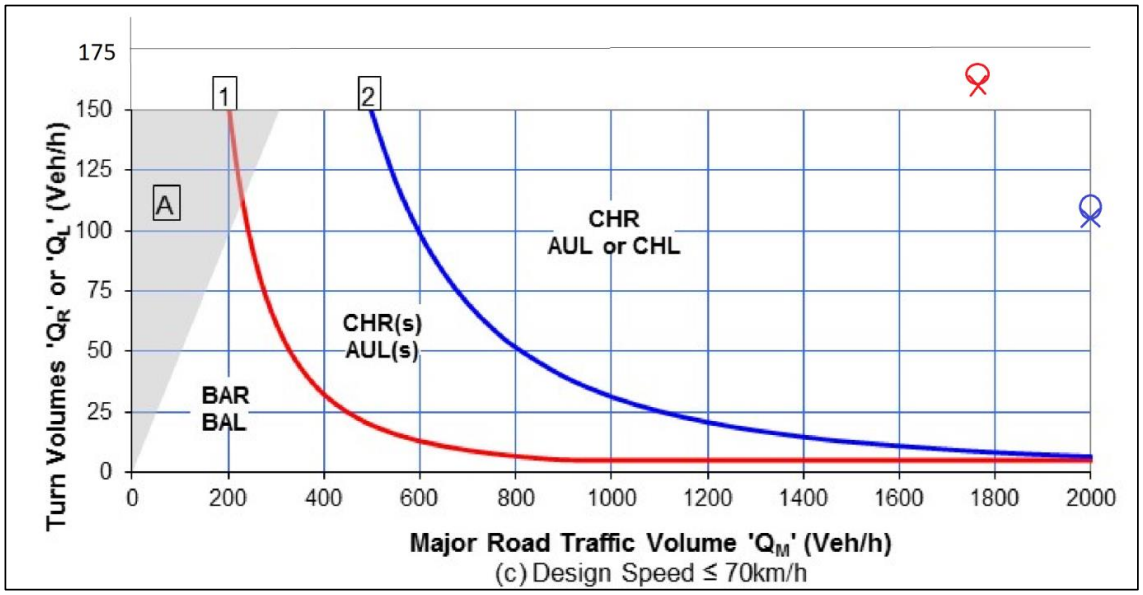
In order to illustrate the turn lane treatments for each of the above scenarios that would be identified by this methodology, the traffic volume parameters determined in Table 5-3 above have been plotted on *Figure 4A-1(c)* (Ref.2) (refer to Figure 5-2). It is noted that the speed limit on the Old Princes Highway in the vicinity of Childs Road is 50km/h (therefore the analysis has adopted a design speed of 60km/h, being a commonly adopted design allowance of 10km/h above the speed limit).

The coordinates of the assessed cases are approximately as indicated on Figure 5-4 and Figure 5-5.



X 2032 AM Base – Left Turn	X 2032 PM Base – Left Turn
O 2032 AM Design – Left Turn	O 2032 PM Design – Left Turn

Figure 5-4 – Warrants for Left Turn Lane Treatment – Old Princes Highway / Childs Road Intersection



X 2032 AM Base – Right Turn	X 2032 PM Base – Right Turn
O 2032 AM Design – Right Turn	O 2032 PM Design – Right Turn

Figure 5-5 – Warrants for Right Turn Lane Treatment – Old Princes Highway / Childs Road Intersection

Based on the results illustrated in Figure 5-4 and Figure 5-5, an auxiliary left turn treatment (**AUL**) and a channelised right turn treatment (**CHR**) would typically be required to be provided at the Old Princes Highway / Childs Road intersection with and without the proposed CBP. However, it is noted that the proposed CBP would not generate any additional left turn traffic from the Old Princes Highway (east) onto Childs Road, and would just marginally increase the right turn traffic onto Childs Road.

In the event that MBDC plans to upgrade / convert the intersection into a signalised intersection, then the provision of the above turn lane treatments would not be considered to be necessary.

Notwithstanding the above analysis, the findings of the crash history review is also relevant in consideration of crash risk at the intersection. The following section of this report discusses.

5.2.2 Crash Statistics

The Government of South Australia data base (http://location.sa.gov.au/viewer) provides recorded road crash data that can be used to understood what, if any, crash history exists at the subject location. From review of this data (MapViewer of the crash location data is provided below as Figure 5-6), there have been no reported crashes at the Old Princes Highway / Childs Road intersection from 2015 to the end of 2019 – noting that the routinely adopted time window metric when issues may be considered to be relevant is 3 casualty crashes in the last 5 years.

Accordingly, there is not considered to be any systematic safety issue at the intersection that would reasonably require further consideration.

Figure 5-6 – Locations of Road Crashes (2015 to the end of 2019)
[Road names added by TTPlus]
Source: http://location.sa.gov.au/viewer

5.2.3 Conclusions in relation to Safety

Based on the results of the SIDRA analysis, the turn lane treatment assessment and the review of historic crash data, the additional traffic associated with the proposed CBP would only generate marginal impacts at the Old Princes Highway / Childs Road intersection, even including the concept of a "peak hour factor" as has been included in this assessment.

Improvement works would typically be considered to be required at the Old Princes Highway / Childs Road intersection even without the proposed CBP on the basis of the modelled operational scenarios. However, MBDC plans to upgrade the Old Princes Highway / Childs Road intersection to cater for future traffic growth – it is likely that that upgraded intersection would operate safely and efficiently with the proposed CBP (as the proposed CBP would only generate a relatively small amount of additional traffic).

6 Summary of Findings

Traffic & Transport Plus has been commissioned by Holcim (Australia) Pty Ltd (**Holcim**) to prepare a traffic impact assessment (**TIA**) report as part of a development application for a proposed concrete batching plant (**CBP**) located at 2 Childs Road, Littlehampton.

The proposed CBP is anticipated to commence operation in late 2021. For the purpose of this TIA, it is conservatively assumed that the proposed CBP would start operation in early 2022, and therefore adopting the traditional ten-year horizon planning approach, the design horizon year for the proposed CBP is 2032.

The demand for concrete follows economic cycles, so it is often difficult to provide definitive volume output estimates; however, in consideration of the potential future market for the subject proposal, Holcim has advised that the maximum annual production rate that will be sought in this application will be 30,000m^3 of concrete (~70,000 tpa) (the **Proposal**).

Site plans for the Proposal are included within **Appendix A**.

Site Accesses:

Due to the two levels of the Subject Site, two site accesses are proposed to be provided on Childs Road.

Transport Routes:

Figure 3-1 within Section 3 of this report illustrates the haul routes for the haulage activities.

Traffic Impact Assessment and Safety Assessment

Based on the results of SIDRA analysis, turn lane treatment assessment and a review of historic crash data, the additional traffic associated with the proposed CBP would only generate marginal impacts at the Old Princes Highway / Childs Road intersection even in consideration of the somewhat conservative assessment approach adopted.

Improvement works would typically be considered to be required at the Old Princes Highway / Childs Road intersection even without the proposed CBP on the basis of the modelled operational scenarios. However, MBDC plans to upgrade the Old Princes Highway / Childs Road intersection to cater for future traffic growth – it is likely that that upgraded intersection would operate safely and efficiently with the proposed CBP (as the proposed CBP would only generate a relatively small amount of additional traffic).

Conclusion

Based on the assessment and recommendations herein, the Proposal is recommended to be approved from a traffic engineering perspective.

Department Principal:
Bryce Trevilyan
Project Contact:
Bryce Trevilyan

TRAFFIC TRANSPORT plus

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TTPlus Ref: 10378
28 July 2021

Holcim (Australia) Pty Ltd
c/- Groundwork Plus
Attention: Mr John Taylor

Dear John

Re: Littlehampton Concrete Batching Plant
Response to Information Request

Traffic & Transport Plus (**TTPlus**) refers to your request to prepare a response to the traffic-related information request items included in Randall Richards's (Senior Planner of Mount Barker District Council (**Council**)) email dated 24 June 2021 in relation to the proposed concrete batching plant (**CBP**) located at 2 Childs Road, Littlehampton (**Subject Site**).

The traffic-related information request items included in Council's email dated 24 June 2021 are duplicated below:

"***Traffic***
The traffic report largely focuses on the impact the development will have at the intersection of Old Princes Hwy and Childs road. The finding from the report are that this development will have a very minimal impact and does not warrant an any upgrades because of this development.

However they have miss-interpreted some information from Council. The report mentions several times that the Old Princes Hwy and Childs Road intersection would require improvement works sometime in the future even without the concrete batching plant and that the MBDC plans to upgrade this intersection to cater for future growth. The quote from Council earlier in the report that they have based this information on reads "… only a preliminary design process that is being done by Council. There is no schedule timeframe for an upgrade at this time (noting that this is a DIT asset). As such, there is not information available to be forwarded at this time."

I have contact Councils Infrastructure Planning Manager and they have confirmed that Council has no plans to upgrade the intersection and that this is DIT asset. The preliminary work being undertaken by Council is in reference to providing kerb lines to the edge of the road and are not proposing any upgrades to the function of the intersection as this would likely be a DIT responsibility. Could you please advise the applicant that Council are not planning to upgrade the function of the intersection so that they are not left with the expectation that this will occur in the near future by Council. Also as a result of this please ask them to confirm their finding that the traffic generated from the concrete batching plant does not warrant any improvement to the intersection of Old Princes Hwy and Childs Road.

Please also request turn paths for the delivery vehicles and operational vehicles demonstrating that they can access the site and egress the site appropriately in a forward direction."

The responses to the traffic-related information request items are detailed within this advice.

Response to information request item related to the performance of the Old Princes Highway / Childs Road intersection

As identified in TTPlus' Traffic Report (Ref.1), the development application of the Adelaide Hills Business Park (**AHBP**) has been approved by Council but has not yet been constructed. It is unknown whether any improvement works at the Old Princes Highway / Childs Road intersection have been conditioned, however as evidenced by the analysis in Ref.1, it is expected that this would be required. The AHBP would generate significantly more trips than the proposed CBP.

As evidenced by the traffic flow diagrams in Appendix B of Ref.1, the key contributing factor to the future unsatisfactory operation of the Old Princes Highway / Childs Road intersection is the large allowance for traffic associated with the AHBP development.

Based on the assessment included in Ref.1, the following is also noted:

1. The existing Old Princes Highway / Childs Road intersection as assessed would operate within satisfactory operating parameters in 2022 from a capacity viewpoint with and without the proposed CBP – it is evident that residual capacity remains;
2. It is reasonable to assume that the AHBP would proceed in the medium term, at which point the AHBP upgrading work would be implemented;
3. The proposed CBP would not generate any additional left turning traffic from the Old Princes Highway (east) into Childs Road, and
4. The proposed CBP would only generate a ~1.0% and ~0.8% increase in traffic volumes at the Old Princes Highway / Childs Road intersection in 2022 and 2032 during peak hour periods and the performance of the Old Princes Highway / Childs Road intersection would only be marginally affected with the additional traffic generated by the proposed development – therefore the impact on operation is considered to be insignificant and no works are reasonably warranted.

It is also noted that the existing asphalt plant will be demolished for the construction of the proposed CBP. The reduction in traffic volumes due to the demolition of this existing use has not been considered in Ref.1, therefore the identified net traffic volume increase (0.8%–1.0%) would actually be smaller than modelled.

An oft-adopted guide with respect to the significance of impacts is when a development adds 5% or more traffic to an intersection, the impacts can be considered to be significant and more detailed investigations would be warranted. The proposed CBP would add less than 0.8%–1.0% net traffic volume increase to the Old Princes Highway / Childs Road intersection, therefore more detailed investigations are not reasonably warranted.

TTPlus considers that the proposed CBP would not generate significant additional traffic impacts on the operation of the Old Princes Highway / Childs Road intersection and it is not reasonable for the proposed CBP to provide the improvement works at this location. The need for upgrading ought more reasonably be aligned with the AHBP development for which upgrading works would in all likelihood be conditioned.

Response to information request item related to turn paths

The Subject Site is split into two portions – an upper level and a lower level. The upper level and lower level of the Subject Site are indicated by the red and blue outlines respectively within Figure 1.

Due to the two levels of the Subject Site, two site accesses are proposed to be provided on Childs Road, as illustrated on Figure 1. Both site accesses are proposed to be located towards the southern end of Childs Road – it is noted that Childs Road is a no-through road at its southern end.

[1] "*Traffic Impact Assessment Report, Littlehampton Concrete Batching Plant*", TTPlus, February 2021.

Light vehicles, tankers and aggregate tippers would access the Subject Site via the upper level access and concrete agitators would access the Subject Site via the lower level access. The generalised movement patterns of service vehicles are illustrated on Figure 1.

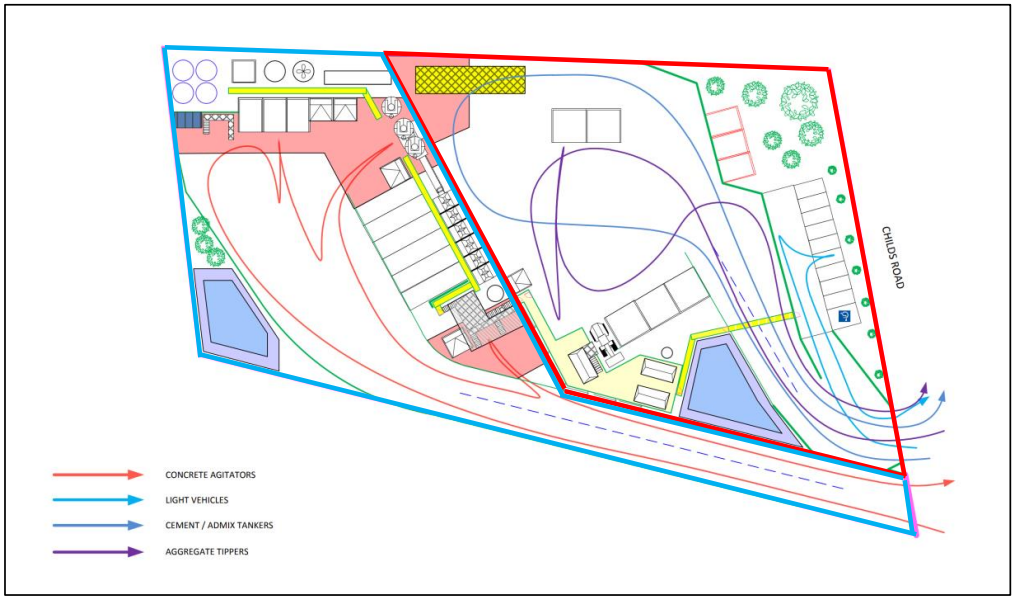


Figure 1 – Generalised Movement Patterns of Service Vehicles

Swept paths of a light vehicle (passenger vehicle), a tanker, a tipper and a concrete agitator have been prepared by Groundwork Plus and are illustrated as Figure 2452.DRG.017 within Appendix B. I have reviewed these swept paths and confirm that they demonstrate that the service vehicles can successfully circulate within the Subject Site and enter and exit the accesses in a forward direction. It is noted that at times it may be difficult for two vehicles to pass (enter and exit) simultaneously, therefore it is recommended that exiting vehicles should be required to wait at the proposed give-way positions (refer to Figure 2452.DRG.017) when there is a vehicle entering the site.

I trust that this information is of assistance. If you require any additional assistance in relation to this matter, please do not hesitate to contact me.

Yours faithfully

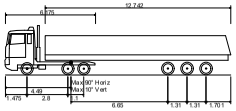
Bryce Trevilyan – RPEQ #7745
Traffic and Transport Plus

Attachment A

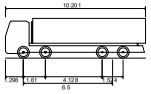
Swept Path Assessment

PROPERTY DESCRIPTION
Part of Lot A98
On F160275
Lot Area 33,248m²
Childs Road, Littlehampton
South Australia 5250

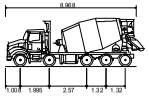
VEHICLE TURNING SUMMARY
Vehicles Used for Analysis:
1. Tanker
   - 2.50m W x 15.46m L
2. Large Tipper
   - 2.50m W x 10.20m L
3. Concrete Agitator
   - 2.50m W x 8.97m L
4. Passenger Vehicle
   - 1.94m W x 5.2m L



Tanker	
Overall Length	15.461m
Overall Width	2.500m
Overall Body Height	3.396m
Min Body Ground Clearance	0.320m
Max Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.500m



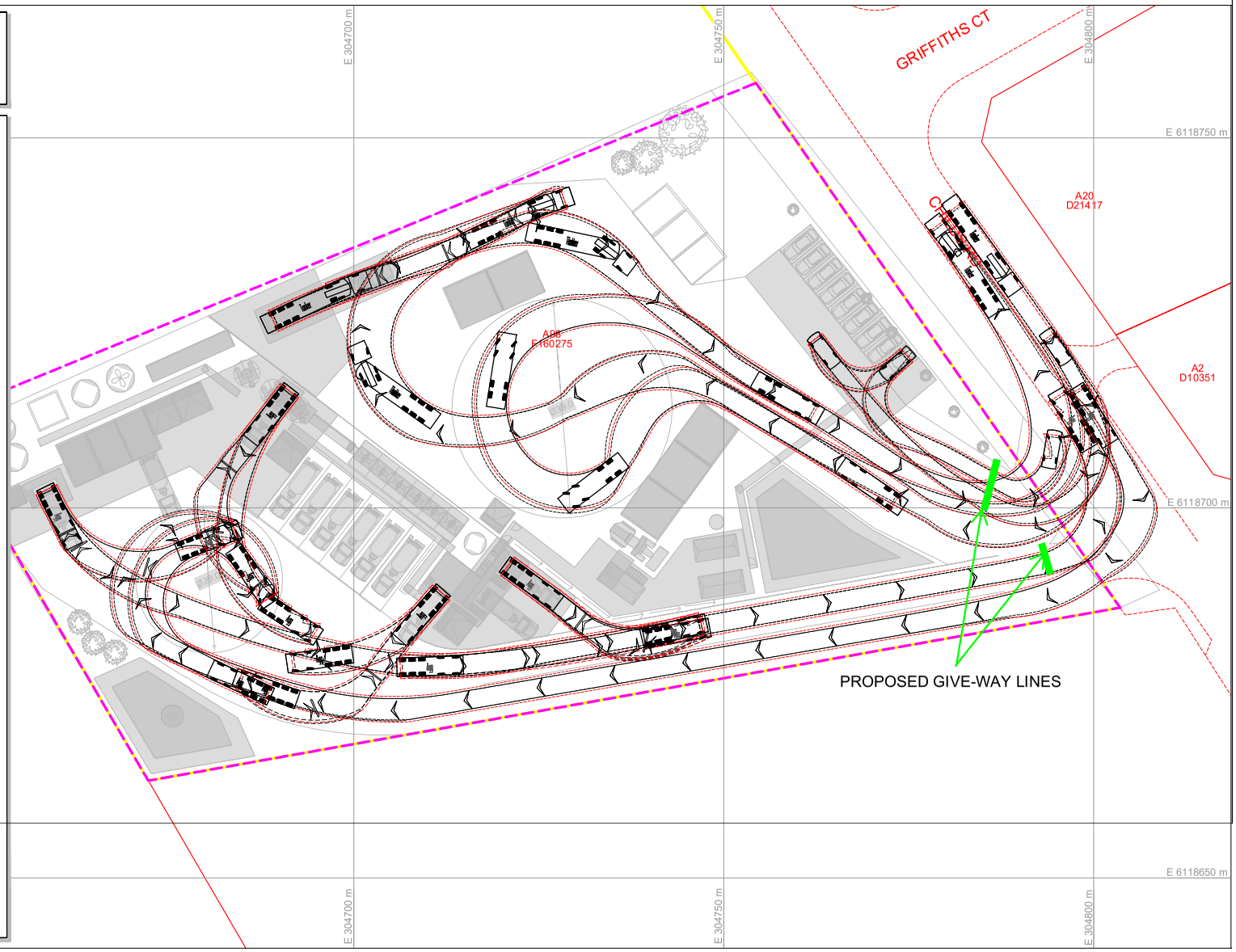
Large Tipper	
Overall Length	10.201m
Overall Width	2.495m
Overall Body Height	2.890m
Min Body Ground Clearance	0.341m
Track Width	2.471m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	11.550m



Mack 10x4 Concrete Agitator	
Overall Length	8.968m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.166m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.850m

Passenger vehicle	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.205m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

NOTE:
- Software used for swept path analysis: Autodesk Vehicle Tracking 2022
- Turning templates: 2013 Austroads Design Vehicles and Turning Path Templates
- All vehicles have 0.3m min clearance



REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography:
Cadastre: © The Government of South Australia (DPTI) 2020
Swept Paths: © 2021 Autodesk Inc. Vehicle Tracking 2022
MGA

Legend:
- Site Boundary
- Cadastral Boundary
- Proposed Lease Area

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton
TITLE: Vehicle Swept Path Analysis

GROUNDWORK plus
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WWW.GROUNDWORK.COM.AU

SCALE: 1:500 0 10m When Printed On A3
DRAWING NUMBER: 2452.DRG.017
REVISION:
DATE: 20 July 2021 DRAWN: JHV
PRINTED: 20 July 2021 CHECKED: JT
DATUM: HORIZONTAL / VERTICAL / ZONE
GDA94 / MGA / AHD / 54

FILE NAME: F:\Jobs\2400\2452 Holcim, Littlehampton\Drawings\Drawings\2452.DRG.017 Vehicle Swept Path Analysis.dwg
JOB SUB #:
CREATED: 20 July 2021

GROUNDWORK plus

CONCRETE BATCHING PLANT
LITTLEHAMPTON

STORMWATER MANAGEMENT PLAN

Prepared for:
Holcim (Australia) Pty Ltd

Holcim

Date:
14 October 2021

File Ref:
2452.800.001

Table of Contents

Project/ Report Details

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Principal Author:	M. Folker
Client:	Holcim (Australia) Pty Ltd
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Engineering Certification

Name	*RPEQ Number*	*Date*	*Signature*
Mark Folker	17269	02/02/2021	

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Table of Contents

FIGURES

1 Introduction

1.1 Project Overview

Groundwork Plus has been commissioned by Holcim (Australia) Pty Ltd ('Holcim') to prepare a Stormwater Management Plan ('SMP') for a new concrete batching plant proposed at 2 Childs Road, Littlehampton SA 5250, properly described as part of Lot 98 on F160275 (herein referred to as the 'site').

1.2 Objectives of the SMP

The scope of this SMP includes the following items for the proposed concrete batching plant:

- Details of stormwater quality management systems
- Implementation and maintenance strategy stormwater management measures and systems.

This SMP outlines the engineering design details and operational management procedures that are to be maintained and/or adopted in order to integrate stormwater management into the daily operations.

1.3 Guidelines and Legislation

The principal legislation addressing pollution in South Australia is the Environment Protection Act 1993 (the 'EP Act'), and the Environment Protection (Water Quality) Policy 2015 ('Water Quality Policy') applies to all inland surface and groundwaters, and marine waters. Clause 20 of the Water Quality Policy lists specific obligations relating to concrete batching plants.

Operators must ensure that:

- Waste generated at the premises is not discharged into any waters or onto land in a place from which it is reasonably likely to enter any waters (including by processes such as seepage or infiltration or carriage by wind, rain, sea spray or stormwater or by the rising of the water table);
- the premises incorporate a wastewater management system; and
- the system is effectively operating in respect of any wastewater generated at the premises while the premises are being used for the works.

2. Stormwater Quantity Management

2.1 Stormwater Hydrology

Refer to **Table 1 – Site Catchment Areas** and **Figure 1 – Stormwater Management Plan** for details of the proposed developed catchments and associated surface grading.

Table 1 – Site Catchment Areas

Catchment ID	Catchment Type	Catchment Area (m²)	Discharge Location
A	Dirty	2,170	Wedge Pit A
B	Dirty	2,289	Sediment Basin SB1
C	Contaminated	1,997	First Flush Tank
D	Clean	2,031	Bio-retention BR1

The "Dirty" areas of the site (Catchment A & B) are defined as those delineated catchments which have the potential for general activities and raw material deliveries that contain non-cementitious materials such as dust (generated by vehicle movements), sand and aggregates. Stormwater runoff in these catchments are limited only to pavements, exposed aggregate and sand materials, thus generating possible suspended solids, however these areas are not affected by pH contaminated associated with the concrete batching process.

The "Contaminated" area of the site (Catchment C) is defined as having potential for general activities, cement deliveries, potential spillage and any washdown waters to contain cementitious material, dust, fly ash or other materials used in the concrete batching process. The areas are exclusively defined where stormwater runoff is affected by increased pH associated with the concrete batching process.

The "Clean" area of the site (Catchment D) refers to the driveway (sealed pavement) area which is not prone to runoff associated with concrete batching activities or aggregate storage.

2.1.1 Hydrologic Modelling

Hydrologic modelling was undertaken using DRAINS (a computer simulation program by Watercom). Site-based rainfall polynomial coefficients were obtained using the Intensity-Frequency-Duration ('IFD') generation tool, available on the Bureau of Meteorology's ('BOM') website. The IFD data is shown below in **Table 2 – IFD Data**.

Table 2 – IFD Data

Duration of Rainfall	Annual Exceedance Probability (AEP)						
	63.20%	50%	20%	10%	5%	2%	1%
5 min	53.8	59.9	80.7	96.5	113	138	158
10 min	38.8	43.2	58.5	70.0	82.3	100	115
15 min	31.2	34.8	47.0	56.3	66.2	80.6	92.8
20 min	26.5	29.5	39.9	47.7	56.1	68.3	78.6
25 min	23.3	25.9	35.0	41.8	49.1	59.8	68.8
30 min	20.9	23.2	31.3	37.4	44.0	53.5	61.5
45 min	16.3	18.2	24.4	29.1	34.2	41.5	47.7
1 hour	13.7	15.2	20.4	24.3	28.5	34.6	39.7
1.5 hour	10.7	11.8	15.8	18.9	22.1	26.8	30.7
2 hour	8.95	9.92	13.2	15.8	18.5	22.3	25.6
3 hour	6.98	7.74	10.3	12.3	14.4	17.4	19.9
4.5 hour	5.45	6.04	8.06	9.58	11.2	13.5	15.5
6 hour	4.58	5.07	6.77	8.04	9.4	11.4	13.0

Note: All rainfall intensities measured in mm/hr.

Design storm durations of 5, 10, 15, 20, 25, 30, 45 and 60 minutes were modelled in DRAINS, with the critical storm duration used to determine the peak discharge for each sub-catchment.

2.1.2 Peak Discharge Comparison

A comparison of estimated peak discharge at the site release point (proposed bio-retention basin) is shown in **Table 3 – Peak Discharge Comparison.** Peak discharge was modelled for the critical storm (duration range 5 minutes to 1 hour) of each AEP event as shown, and considers the pre-developed site is 100% grass cover. The DRAINS model also assumes the first flush tank is empty to meet the first flush requirements, and the sediment basin is also maintained with suitable freeboard to retain the upper settling volume (100kL). The total available detention volume included in the system is therefore assumed to be 140kL.

Table 3 – Peak Discharge Comparison

Scenario	Annual Exceedance Probability (AEP)						Peak Discharge
	1%	2%	5%	10%	20%	50%	
Existing	128	99.0	63.0	35.0	2.00	0.00	L/s
Developed	23.0	0.00	0.00	0.00	0.00	0.00	

2.2 First Flush Tank Design Details

The EPA's *Guideline for Air & Water Quality: Concrete Batching (2016)* states that contaminated stormwater and process wastewater should be captured and recycled onsite. The proposed site surface grading is shown in **Figure 1 - Stormwater Management Plan**. The proposed site grading isolates the contaminated catchments from the uncontaminated areas. As demonstrated through the proposed site contours, a first flush tank is located at the low point within Catchment C, at RL 336.12 (approximately).

2.2.1 First Flush Tank Size and Water Harvesting

Details of the location and size of the first flush tank are as shown in **Figure 1 – Stormwater Management Plan.** The size of the first flush tank (40kL) is consistent with the industry recognised standard for concrete batching *Environmental Management Guideline for Concrete Batch Plants (CCAA, 2017)*, capturing the first 20mm of runoff for the contributing area.

A pumping system with 10L/s is proposed to harvest collected water from the first flush tank and direct harvested water to the stirrer pit for reuse in concrete batching activities. The first flush tank will be emptied using the proposed pump system following each rainfall event.

The applicant plans to use all harvested water from the first flush tank, since it is a resource that can be utilised in the concrete batching process. An additional first flush tank can be installed adjacent to the slump stands for additional harvesting and reuse, however this is in addition to the minimum requirements to capture the first 20mm of runoff.

Any installed first flush tanks must be kept empty at all times, to ensure that adequate volume is available prior to a rainfall event occurring, and then emptied as quickly as possible after a rainfall event.

If harvested surface water is surplus to needs of the operations, or otherwise not able to be reused, the water shall be dealt with as 'waste water' and removed from site via a licensed waste removal contractor, where water quality monitoring indicates that the captured surface water is not suitable for discharge. Contaminated water from the first flush system must not be pumped, or released into the stormwater drainage system.

Monitoring of stormwater for the site will be undertaken in accordance with Schedule 1 of the Environment Protection (Water Quality) Policy, as outlined in **Section 4 - Operational Procedures**.

2.3 Wedge Pits and Sediment Basins

The EPA's *Guideline for Air & Water Quality: Concrete Batching (2016)* states that uncontaminated stormwater from building roofs, roads and other paved areas, etc, may be separated from the wastewater collection system and directed through a suitable interceptor or sediment collection system.

As shown on **Figure 1 – Stormwater Management Plan**, wedge pits and sediment basins are proposed to treat the aggregate storage areas (dirty areas) demarcated in Catchments A & B. Further details of the sizing and location of these wedge pits are included in **Section 3 – Stormwater Quality Management**.

2.4 Bio-retention Basin

As shown on **Figure 1 – Stormwater Management Plan**, a bio-retention basin is proposed on the western site discharge point, to provide treatment prior to discharge from the site. Overflows from the wedge pits and sediment basin will discharge into the bio-retention system for additional treatment and is presumed clean. No contaminated discharge from contaminated Catchment C is to be directed into the bio-retention system (or otherwise offsite).

3. Stormwater Quality Management

3.1 Stormwater Quality Objectives

Best Management Practices ('BMP') are required to be demonstrated within the Mount Barker District Council. The following load-reduction targets must be achieved when assessing the post-developed site treatment train (comparison of unmitigated developed case versus developed mitigated case):

- 80% for Total Suspended Solids ('TSS')
- 60% for Total Phosphorous ('TP')
- 45% for Total Nitrogen ('TN')
- 90% for Gross Pollutants ('GP').

Achieving the above Water Quality Objectives ('WQO's) for the site will ensure the environmental values of the downstream urban receiving waters are maintained for the operational phase of the development.

3.2 Stormwater Quality Modelling Approach

3.2.1 MUSIC Model

Water quality modelling has been undertaken for the operational phase using the *Model for Urban Stormwater Improvement Conceptualisation* ('MUSIC') software Version 6.0. A Stormwater Quality Interceptor Device ('SQID') treatment system has been designed and modelled to demonstrate the system effectiveness in achieving the target WQOs.

3.2.2 Rainfall and Evapotranspiration Data

MUSIC modelling was based on six (6) minute interval data obtained from BOM for rainfall station 'Adelaide', as summarised in **Table 4 – Meteorological and Rainfall Runoff Data Reporting Table**.

Table 4 – Meteorological and Rainfall Runoff Data Reporting Table

Input	Data Used in Modelling
Rainfall Station	Adelaide
Time Step	6 minutes
Modelling Period	1/01/1970 to 31/12/1970
Rainfall Runoff Parameters	Urban (Industrial)
Pollutant Export Parameters	Urban (Industrial)

3.2.3 MUSIC Model Catchment Parameters

The site has been modelled as "Urban (Industrial)" for the purposes of MUSIC modelling as detailed in **Table 5 – Catchment Definition Reporting Table**.

Table 5 – Catchment Definition Reporting Table

Catchment ID	Area (ha)	Land Use	Total Impervious Area (%)
Catchment A	0.217	Urban Industrial – Road	100
Catchment B	0.229	Urban Industrial – Road	100
Catchment C	0.199	Urban Industrial – Road	100
Catchment D	0.203	Urban Industrial – Road	100
Total Area	0.853		

3.2.4 Model Parameter Definition

The MUSIC modelling algorithm used to generate urban runoff is based on the data from the *Music Modelling Guidelines, Version 1.0 (Water by Design, 2010)*. The relevant Urban (Industrial) parameters are summarised in **Table 6 – Rainfall Runoff Reporting** and **Table 7 – Pollutant Export Parameters for Urban Industrial Land Use**.

Table 6 – Rainfall Runoff Reporting

Parameter	All Nodes
Land Use	Urban (Industrial)
Rainfall Threshold (mm)	1
Soil Storage Capacity (mm)	18
Initial Storage (% Capacity)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient a	243
Infiltration Capacity Exponent b	0.6
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Baseflow Rate (%)	31
Daily Seepage Rate (%)	0

Table 7 – Pollutant Export Parameters for Urban Industrial Land Use

Flow Type	Surface Type	TSS log^{10} Values		TP log^{10} Values		TN log^{10} Values	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Baseflow Parameters	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Roads	0.78	0.45	-1.11	0.48	0.14	0.20
	Ground Level	0.78	0.45	-1.11	0.48	0.14	0.20
Stormflow Parameters	Roof	1.30	0.44	-0.89	0.36	0.25	0.32
	Roads	2.43	0.44	-0.30	0.36	0.25	0.32
	Ground Level	1.92	0.44	-0.59	0.36	0.25	0.32

3.3 Stormwater Quality Improvement Device (SQID) Treatment System Details

A series of first flush tank, wedge pit and bio-retention basin systems are proposed to meet the WQOs applicable for the site. The MUSIC Model Schematic in Diagram 2 details the catchment routing to the lawful point of discharge. **Table 8 – Bio-retention Basin MUSIC Parameters** summarises the input parameters applied to the MUSIC model for the proposed bio-retention basins. These details will be confirmed during the detailed design phase of the proposed development.

Table 8 – Bio-retention Basin MUSIC Parameters

Design Properties	Details
Extended Detention Depth (m)	0.30
Surface Area (m^2)	185
Filter Area (m^2)	100
Filter Depth (mm)	400
TN Content of Filter Media (mg/kg)	800
Hydraulic conductivity (mm/h)	200

Table 9 – Wedge Pit and Sediment Basin MUSIC Parameters outlines the input parameters used for the proposed wedge pits. No discharge from the first flush tank is assumed, due to the tank capacity and the proposed site grading.

Table 9 – Wedge Pit MUSIC Parameters

Design Properties	Wedge Pit A	Sediment Basin
Surface Area (m^2)	20	134
Extended detention (m)	0.3	1.0
Permanent Pool Volume (m^3)	14	30
Initial Volume (m^3)	14	30

3.4 MUSIC Modelling Results

3.4.1 Treatment Train Effectiveness

Based on the site characteristics and the proposed SQIDs, this assessment has developed an overall concept that will satisfy the requirements of downstream environmental protection. **Diagram 1 – Treatment Train Layout and MUSIC Results** shows a schematic representation of the proposed treatment train elements, while their location within the proposed development is illustrated on the drawings included in **Figure 1 – Stormwater Management Plan**.

The results of the MUSIC Modelling for the treatment train effectiveness are summarised in **Table 10 – Treatment Train Effectiveness**. These results indicate reduction targets for TSS, TP, TN and gross pollutants respectively, are all achieved for the rainfall data set simulated.

Table 10 – Treatment Train Effectiveness

Catchment ID	Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
Site	TSS	853	48.8	94.3	80.0
	TP	1.41	0.348	75.4	60.0
	TN	5.88	2.39	59.4	45.0
	GP	124	0	100	90.0

Note: All simulations have been run with pollutant export estimation set to "stochastic generation".

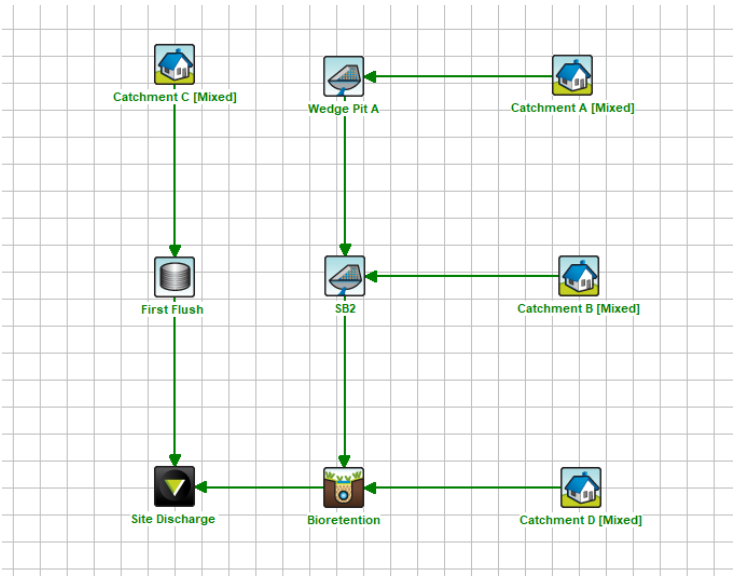


Diagram 1 – Treatment Train Layout and MUSIC Results

4. Operational Procedures

An overview of the proposed Operational Procedures for implementation at the site are summarised below.

Aspect	Details
Purpose	The Operational Procedures have been prepared to manage potential environmental impacts that may result from the operation in relation to stormwater management.
Risk Sources and Potential Impacts	Adverse impacts resulting from current and future operations may include the following: • Contaminated surface water from asphalt plant operations • Overland flows from storage and handling areas of oils, greases and other chemicals; and • Hydrocarbons and chemicals • Construction and maintenance of carpark, roads and hardstands • Spillage during handling of materials • Use and storage of oils, greases and other chemicals.
Performance Targets	It is proposed that the concrete batching plant adheres to the requirements of the Consent conditions and Environmental Protection Agency ('EPA') permit conditions. Monitoring of stormwater from the concrete batching plant will be undertaken in accordance with Schedule 1 of the Environment Protection (Water Quality) Policy.
Responsibilities	The Operations Manager will be primarily responsible for the implementation of this SMP.
Strategies/mitigation measures	***Oil separators, and Bunding of Chemicals*** Clearly designate storage areas and do not deviate from assigned bunded areas for storage of chemicals, unless a suitable secondary bund is provided. Oil separators to be provided where necessary. • All petroleum product storage tanks must be bunded according to AS 1940 and the EPA Guideline *Bunding and Spill Management* (2007) • All empty drums must be stored on a concrete hardstand area with their closures in place • Drains or bunds must be provided to ensure stormwater runoff is excluded from the contaminated area. Storing and handling of hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of: • AS 1692-2006 - Steel tanks for flammable and combustible liquids • AS 3780:2008 – The storage and handling of corrosive substances • AS 1940:2004 – The storage and handling of flammable and combustible liquid • AS 3833:2007 - Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers. ***First Flush Tank & Bunding of contaminated areas*** Operate and maintain proposed first flush tank and pump system in accordance with **Section 2.2 – First Flush Tank Design Details**. • Details of tanks to be noted and maintained • Operations must be carried out in accordance with EPA permit and industry best practice.
Auditing	Stormwater management reviews are required to be carried out on a periodic bases to assess the implementation of the management strategies.

Identification of Incident or Failure	Non-compliance with the performance criteria herein will be identified by: • Stormwater in first flush system exceeds capacity after rainfall event due to insufficient freeboard (40kL volume is required) • Pump system and additional tank not maintained and emptied • Release of contaminants from the site • Poor vegetation establishment • Poorly maintained, damaged or failed stormwater management devices • Uncontrolled release from site • Non-compliant water quality being released from site.
Corrective Action	The Operations Manager shall be responsible for identification of incident or failure and completion of corrective actions. Following identification of incident or failure, the source/cause is to be immediately identified and rectified with records kept to prevent future incidents occurring.
Internal Reporting	A copy of all incidents and complaints will be stored at the site within the incident and complaint register.
External Reporting	Reporting of non-compliance events including discharge of contaminants from the site are to be reported in accordance with Council and EPA requirements.

An inspection and maintenance program should be implemented as detailed in **Table 11 - Inspections and Maintenance of Stormwater and Wastewater Treatment Systems.** A summary schedule of the various inspections, performance criteria and responses that shall be performed on site is shown below.

Table 11 – Inspections and Maintenance of Stormwater and Wastewater Treatment Systems

Device	Minimum Frequency	Performance Criteria	Required Actions
First Flush Tank	Prior to forecast rainfall event, following each rainfall event, and every 2 weeks	• Adequate volume available, all tanks in satisfactory condition, no leaking or damage • No discharge from Catchment C	• Volume to be restored immediately (either reused in operations or removed from site via trade waste facilities) • Any identified damage to be repaired • Maintain pump system
Sediment Basins & Bio-retention	Annually, prior to wet season	• No erosion or blockage of filter media • No weeds	• Eroded areas shall be rehabilitated, filter media shall be replaced once blockages occur • Weeds shall be removed • Water quality to be monitored with reference to EPA / ANZECC
Waste containers	Weekly	• Waste is stored in appropriate containers • Waste receptacles labelled	• Ensure waste material is stored and disposed of properly and in accordance with conditions of the EPA permit and relevant legislative requirements
Spill response stations	Weekly and following use	• Equipment is properly maintained	• Maintain equipment • Replace used equipment
Maintenance area	Weekly	• Fuel, oil spills	• Clean up fuel spills and investigate source
		• Equipment maintenance	• Maintain equipment maintenance records

5. Erosion and Sediment Control - Construction

During construction the site will encounter additional site disturbance as part of the bulk earthworks and construction process. The following construction plan is proposed to manage erosion and sediment risk during construction:

1. Erect Silt fencing along perimeter of site, downstream of where anticipated disturbance activities will be undertaken;
2. Confirm location of bio-retention & first flush tank systems and excavate to volumes and depths required;
3. Ensure excavated soil is placed at the proposed location and protected from cleanwater, with silt fencing erected as required;
4. Undertake site grading and earthworks as required to achieve ultimate operational drainage catchments and construct temporary diversion drains to excavated sediment traps and/or basins.
5. Once hardstand areas are completed (including first flush tank system) and soil disturbance is minimised (i.e at operational completion) treat and release any captured sediment laden water to suitable water quality limits or otherwise remove from site, and infill the bio-retention with the required sand filter media and details shown on **Figure 1 – Stormwater Management Plan.**
6. Establish Sediment Basin 1 and remove any excess topsoil that remains onsite.

All of the above details are shown in **Figure 2 – Erosion and Sediment Control Plan**.

6. Responsibilities

6.1 Monitoring Management Measures

The following management measures will be implemented during facility operations:

- The **Manager** or authorised representative is to regularly inspect the stormwater management devices, particularly prior to forecasted wet weather and following major rainfall events to ensure that these devices are in good working order. All inspections are to be documented (including photos) and available on site at all times.
- The **Manager** shall carry out general surveillance to qualitatively assess stormwater releases from site during discharge events.
- A surface water quality monitoring program may be implemented to assess performance from time to time. Any sampling conducted shall be undertaken by a suitability qualified person.

6.2 Auditing and Review

The effectiveness of the SMP will be reviewed as necessary (e.g. following a change in site operations) and at least once every year. The review shall take into account changes to site activities, available surface water monitoring results, any complaints, pollution incidents and any corrective actions taken.

6.3 Responsibility

The following details the responsibilities with regard to the ongoing operations:

- The **Manager** will be responsible for the implementation of this SMP and for training of site personnel in their responsibilities in relation to this SMP.
- The **Manager** will be responsible for ensuring that all stormwater devices constructed on the site have adequate free water storage capacity.
- All complaints pertaining to water quality received will be recorded in the complaints register/log maintained on-site.
- The **Manager** or a suitably qualified consultant will prepare water monitoring records if and when required by the regulatory authority.
- Records, including results of any monitoring program undertaken on-site, complaints or incidents will be kept on-site for a minimum of five (5) years.

6.4 Identification of Incident or Failure

An incident or failure may include, but not be limited to:

- Deterioration in surface water quality within waters discharged from site
- Receipt of a stormwater quality release complaint
- Not maintaining on-site stormwater controls or treatment devices.

Any identification of incident or failure will be recorded on site.

7. Environmental Incidents

The **Manager** will be responsible for ensuring that all employees at the site are familiar with the procedure for incidents recording. Any employee becoming aware of an incident with actual or potential environmental implications, shall be reported to the **Manager** or delegate immediately.

The **Manager** will notify upper management regarding any environmental incident. An Environmental Incident Report must be completed for all incidents.

Should reporting of an **environmental incident** to the relevant regulatory authority be required, this will be undertaken in accordance with the following.

When an environmental incident occurs, the **Manager** will notify administering authority via telephone and in writing.

The contact details of the administering authority are as follows:

Department for Environment and Water
Phone: +61 8 8204 1910
Email: https://www.environment.sa.gov.au/contact-us

Following notification against this condition, an investigation and further reporting will be required as per Section 6.1 below.

7.1 Investigation

All incidents should be investigated. The investigations should include:

- Determining what activities were being carried out at the time of the complaint/incident and any equipment involved.
- Identifying whether equipment or activities on-site were the cause of the incident or complaint.
- Determining what potential actions may be carried out to resolve the matter and/or minimise the likelihood of further impacts.

An assessment is to be conducted to determine what corrective actions are to be taken to remedy the matter and/or prevent a similar incident from occurring in the future. If monitoring is to be undertaken to investigate an incident or complaint these results should be supplied with the final report to the administering authority.

7.2 Reporting

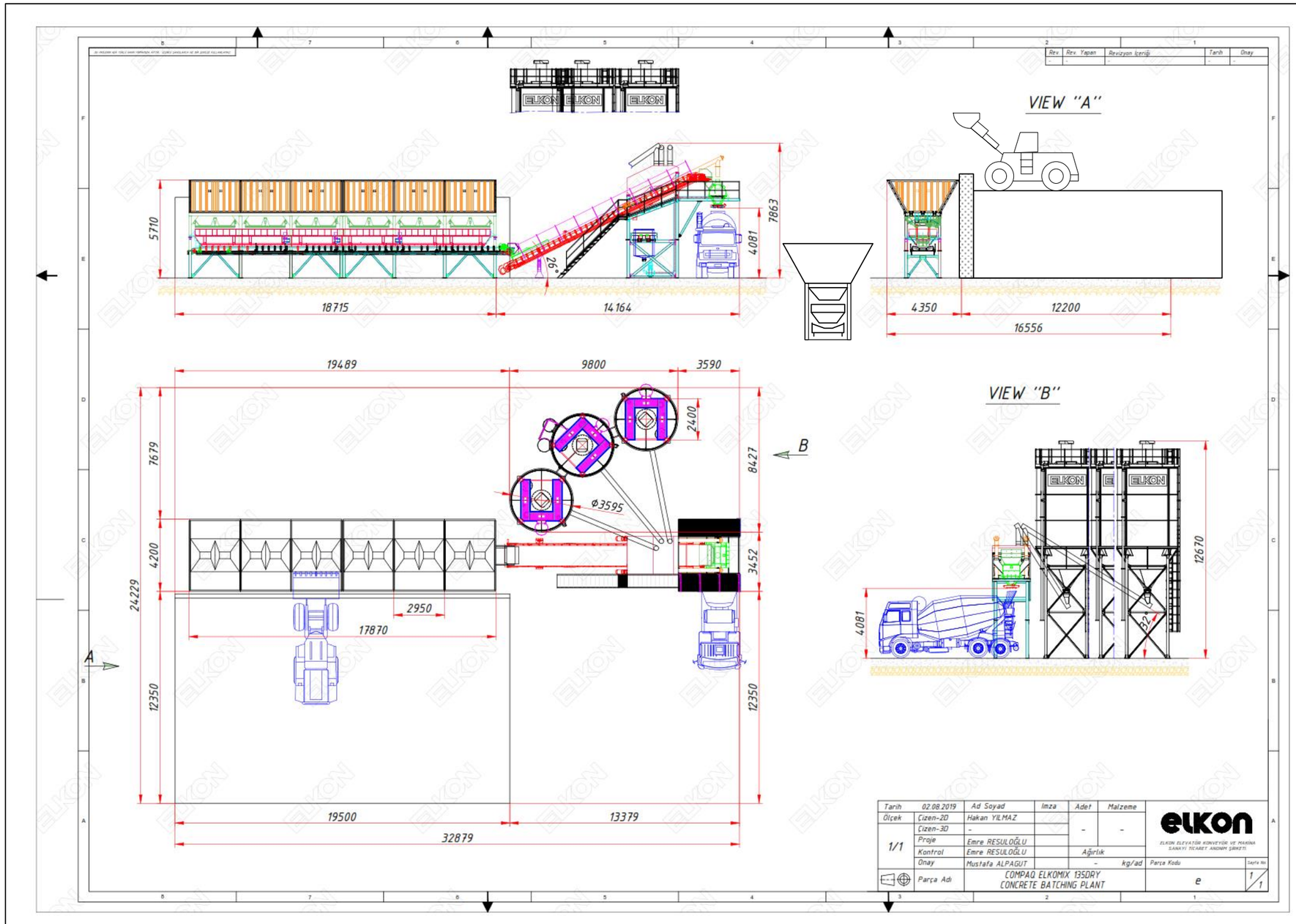
A written notice detailing the following information may need to be provided to the administering authority, following the initial notification**.** General information likely to be required for any further reporting to the administering authority may include the following:

- The name of the operator
- The name and telephone number of a designated contact person
- A description of the event
- The results of any monitoring performed in relation to the event
- Actions taken to mitigate any environmental harm caused by the event
- Proposed actions to prevent a recurrence of the event.

8. Conclusion

This SMP outlines the appropriate treatment measures and operational procedures to be adopted to integrate adequate stormwater management into the daily operations and the site activities. Specifically, this document has been prepared to ensure that appropriate measures have been developed to meet the requirements of industry best practice.

Operational procedures outlined in this SMP will assist to ensure compliance as a minimum standard.



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I	MOD AGG ENTRY & CONT CATCH	S.KINSELLA	17NOV20		
J	SIDE ELEVATIONS ADDED	S.KINSELLA	19NOV20		
K	LAYOUT MODIFIED	S.KINSELLA	10DEC20		
L	UPPER LVL ACCESS RELOCATED	S.KINSELLA	18JAN21		

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LITTLEHAMPTON (Mt. BARKER) CONCRETE PLANT
CONCEPTS
TYPICAL PLANT

SIZE	FILE NAME	DWG NO	REV
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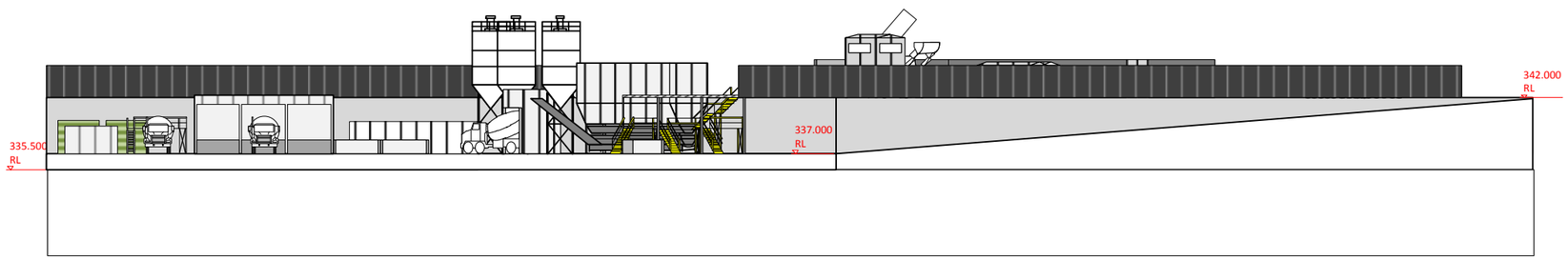

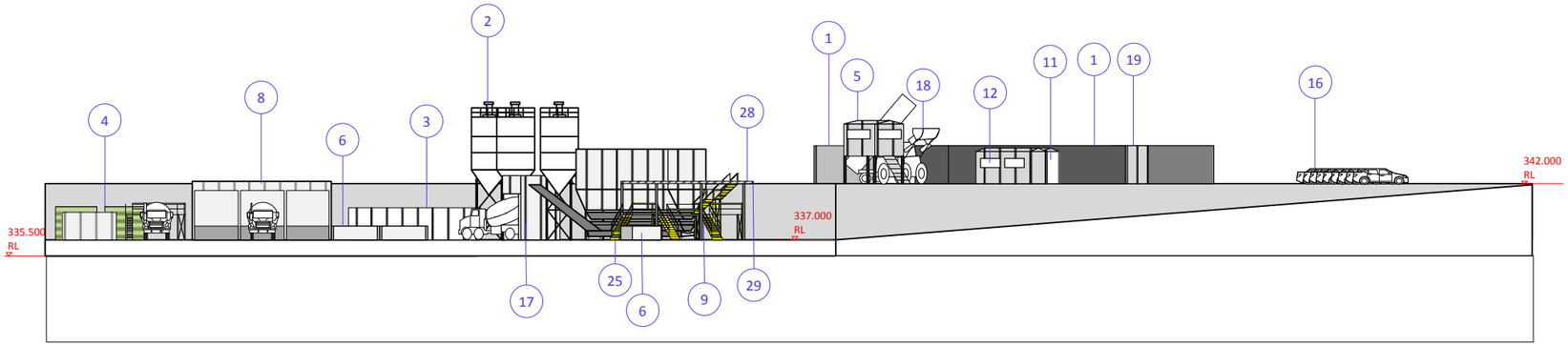

ID	DESCRIPTION
1	150t AGGREGATE GROUND BINS
2	3x VERTICAL SILOS
3	1x ADMIXTURE STORES
4	4x 25kL WATER TANKS
5	1x BATCH OFFICE (RAISED WITH PLATFORM TO LOADER)
6	WEDGE PIT
7	STIRRER TANK
8	3x WASHOUT BOX
9	2x SLUMP STANDS
10	CONTAMINATED AREA
11	ABLUTIONS
12	LUNCH ROOM
13	FIRST FLUSH PIT
14	6x AGITATOR PARKING
15	TANKER UNLOADING
16	10x CAR PARKING
17	LOAD BAY
18	LOADER PARKING
19	OPTIONAL GEOSTONE BINS
20	AGGREGATE TRUCK / TANKER ENTRY
21	LV ENTRY
22	AGI ENTRY
23	LOADER DRIVEWAY (ACCESS TO BOTTOM OF YARD)
24	SEPTIC TANK
25	SPECIAL PRODUCTS DOSING PLATFORM
26	RETENTION / SETTLEMENT BASIN
27	DRAIN FROM WEDGE PIT TO SETTLEMENT BASIN
28	LIVE BIN SYSTEM
29	SLUMP STAND ROOF

REVISIONS					
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I	MOD AGG ENTRY & CONT CATCH	S.KINSELLA	17NOV20		
J	SIDE ELEVATIONS ADDED	S.KINSELLA	19NOV20		
K	LAYOUT MODIFIED	S.KINSELLA	10DEC20		
L	UPPER LVL ACCESS RELOCATED	S.KINSELLA	18JAN21		

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LITTLEHAMPTON (Mt. BARKER) CONCRETE PLANT
CONCEPTS
SIDE ELEVATION

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ID	DESCRIPTION
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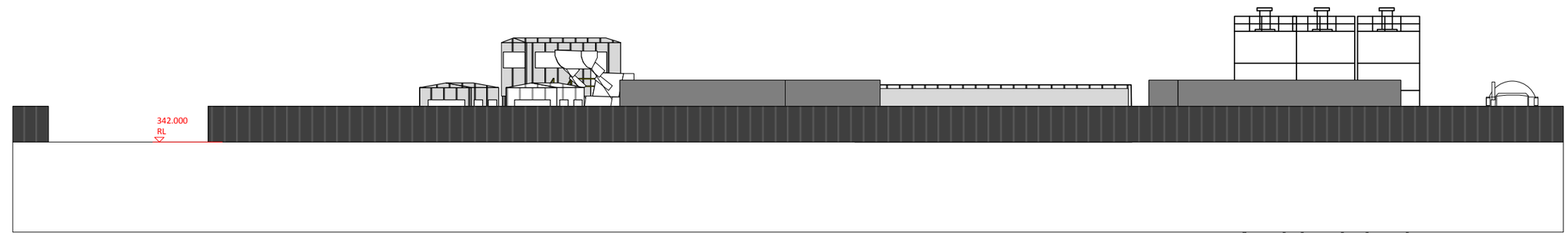
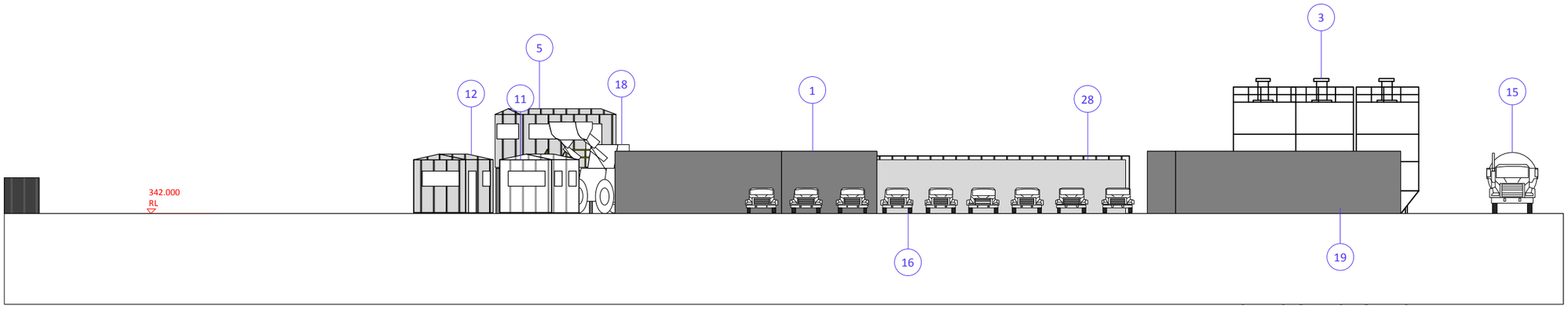
3	1x ADMIXTURE STORES
4	4x 25kL WATER TANKS
5	1x BATCH OFFICE (RAISED WITH PLATFORM TO LOADER)
6	WEDGE PIT
7	STIRRER TANK
8	3x WASHOUT BOX
9	2x SLUMP STANDS
10	CONTAMINATED AREA
11	ABLUTIONS
12	LUNCH ROOM
13	FIRST FLUSH PIT
14	6x AGITATOR PARKING
15	TANKER UNLOADING

ID	DESCRIPTION
16	10x CAR PARKING
17	LOAD BAY
18	LOADER PARKING
19	OPTIONAL GEOSTONE BINS
20	AGGREGATE TRUCK / TANKER ENTRY
21	LV ENTRY
22	AGI ENTRY
23	LOADER DRIVEWAY (ACCESS TO BOTTOM OF YARD)
24	SEPTIC TANK
25	SPECIAL PRODUCTS DOSING PLATFORM
26	RETENTION / SETTLEMENT BASIN
27	DRAIN FROM WEDGE PIT TO SETTLEMENT BASIN
28	LIVE BIN SYSTEM
29	SLUMP STAND ROOF





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K	LAYOUT MODIFIED	S.KINSELLA	10DEC20		
L	UPPER LVL ACCESS RELOCATED	S.KINSELLA	18JAN21		

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LITTLEHAMPTON (Mt. BARKER) CONCRETE PLANT
CONCEPTS
FRONT ELEVATION

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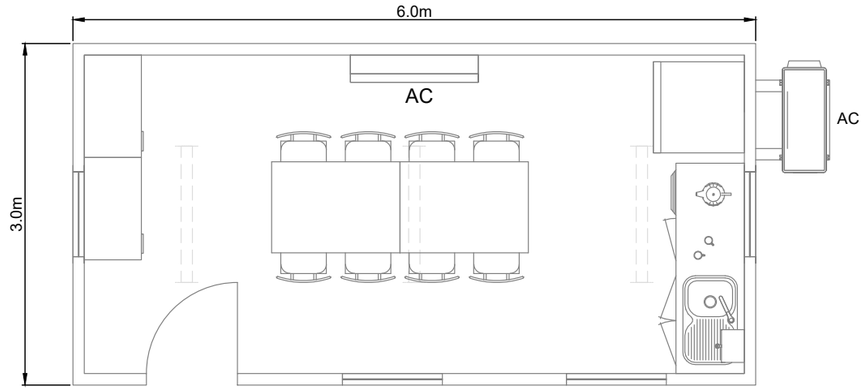
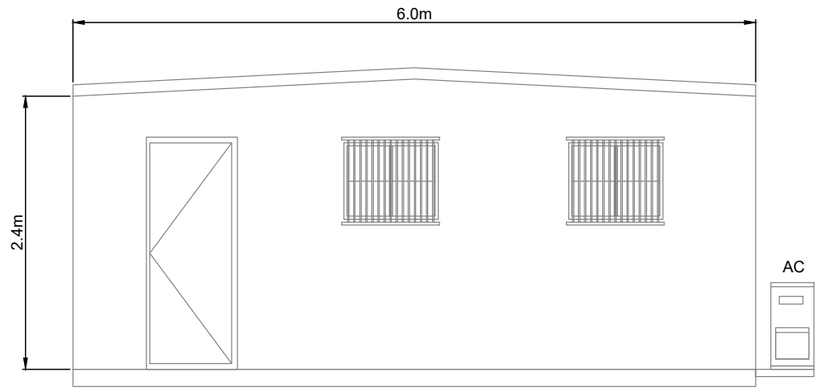


Lunch Room (Structure No.12)
Plan Layout



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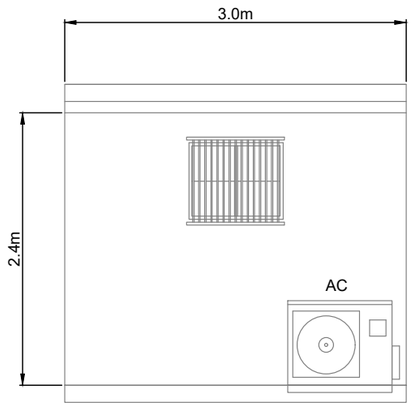

Lunch Room (Structure No.12)
Side Elevation

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography:
Cadastre:
Ecosystem:
SRTM:

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton
TITLE: Lunch Room Plan Layout and Elevations

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

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REVISION:
DATE: 27 November 2020
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PRINTED: 27 November 2020
CHECKED: JT
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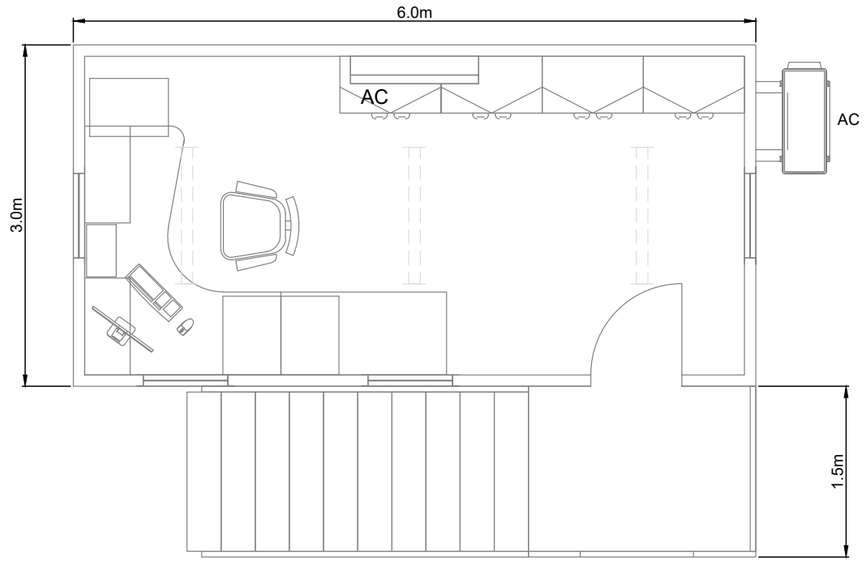
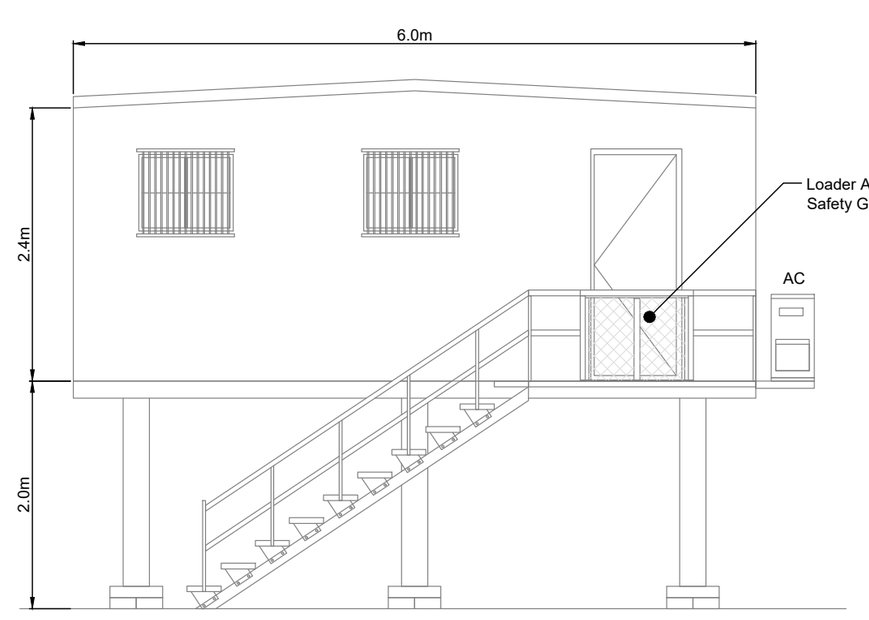
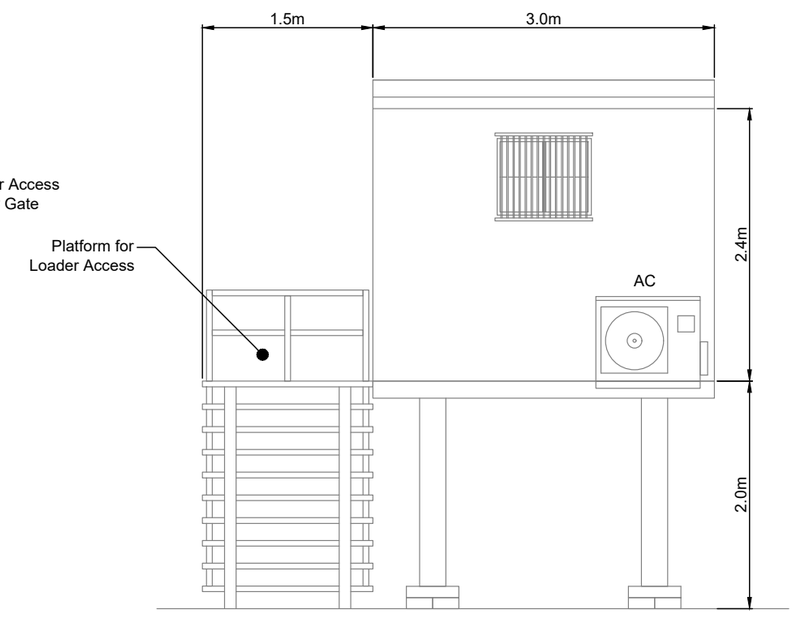
GDA94 / MGA / AHD / 54



Batch Office - Raised to Platform with Loader (Structure No.5)
Plan Layout



Batch Office - Raised to Platform with Loader (Structure No.5)
Front Elevation



Batch Office - Raised to Platform with Loader (Structure No.5)
Side Elevation

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography:
Topography:
Cadastre:
Ecosystem:
SRTM:

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton

TITLE: Batch Office Plan Layout and Elevations

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PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

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DATE: 27 November 2020
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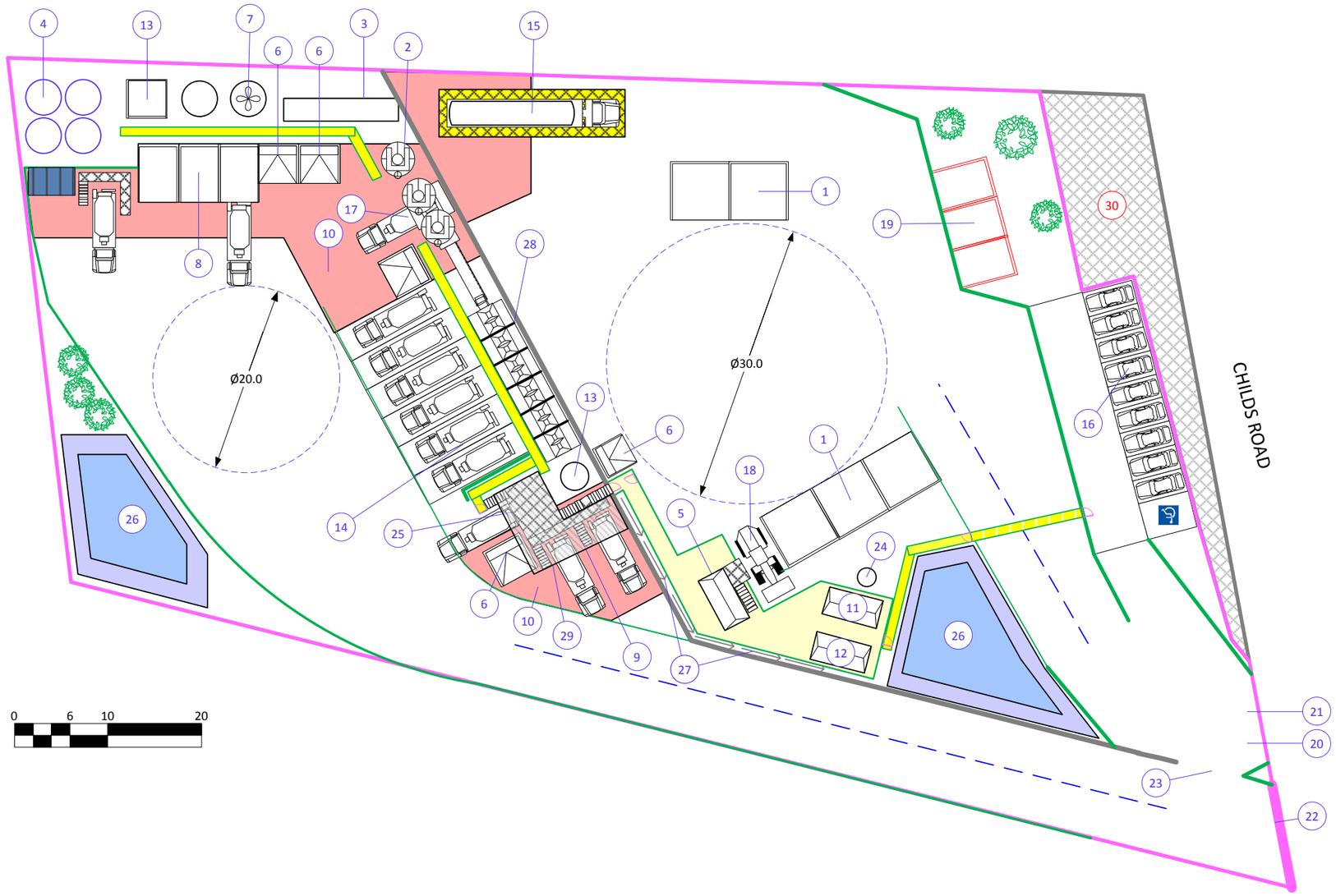

ID	DESCRIPTION
1	150t AGGREGATE GROUND BINS
2	3x VERTICAL SILOS
3	1x ADMIXTURE STORES
4	4x 25kL WATER TANKS
5	1x BATCH OFFICE (RAISED WITH PLATFORM TO LOADER)
6	WEDGE PIT
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11	ABLUTIONS
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23	LOADER DRIVEWAY (ACCESS TO BOTTOM OF YARD)
24	SEPTIC TANK
25	SPECIAL PRODUCTS DOSING PLATFORM
26	RETENTION / SETTLEMENT BASIN
27	DRAIN FROM WEDGE PIT TO SETTLEMENT BASIN
28	LIVE BIN SYSTEM
29	SLUMP STAND ROOF
30	AREA EXCLUDED FROM HOLCIMS APPLICATION

REVISIONS					
REV	DESCRIPTION	DRAWN	DATE	APPROVED	DATE
N	ITEM 30 EXCLUDED AREA ADDED	S.KINSELLA	22JUL2021		

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LITTLEHAMPTON (Mt. BARKER) CONCRETE PLANT
CONCEPTS
LAYOUT

SIZE	FILE NAME	DWG NO	REV
A3	9050-R-PE-DG-001_N LITTLEHAMPTON CONCRETE PLANT - CONCEPTS.VSD	9050-R-PE-DG-001	N

SCALE	1:500	DO NOT SCALE	SHEET	6 OF 9

NOTE :

1. Contours external to the Site Boundary and in areas of dense vegetation are to be considered uncertain.
2. 2011 SRTM (Shuttle Radar Topography Mission) 1sec Digital Elevation Model has not captured a gully along the south of the site where dense vegetation is present.

REV	DESCRIPTION	DATE	BY

Data Sources:
Photography: Groundwork Plus UAV Survey, Captured 2020-02-17
Topography: Groundwork Plus UAV Survey, Captured 2020-02-17
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
SRTM: © Commonwealth of Australia (Geoscience Australia) 2011

Legend:
- Site Boundary
- Cadastral Boundary
- Proposed Lease Area

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton
TITLE: Orthophoto and Contour Plan (2020-02-12)

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

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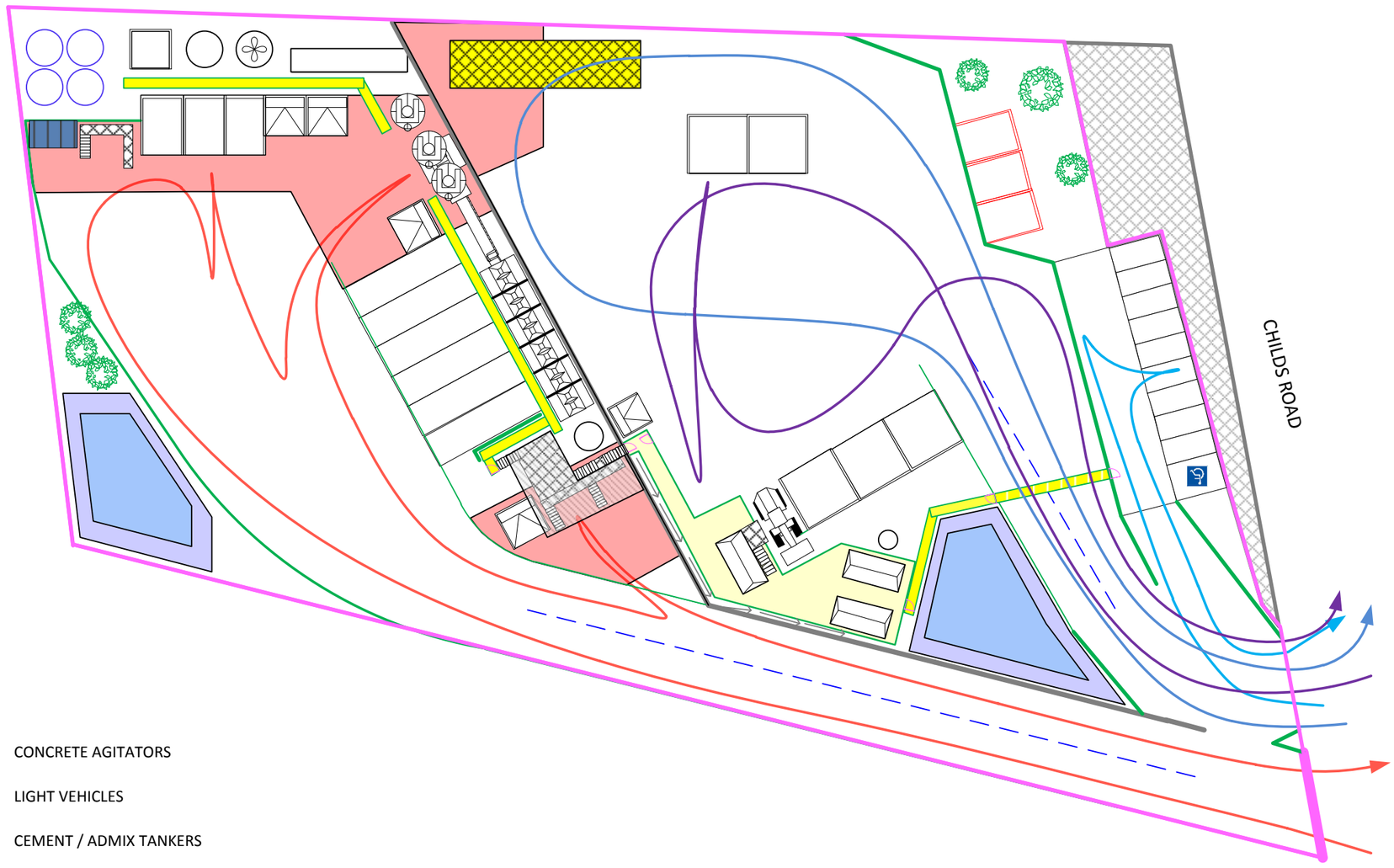
REVISION:
DATE: 22 January 2021 DRAWN: JHV
PRINTED: 22 January 2021 CHECKED: JT
DATUM: HORIZONTAL / VERTICAL / ZONE: GDA94 / MGA / AHD / 54

FILE NAME: F:\Jobs\2400\2452 Holcim Littlehampton\Drawing\Drawing\2452.DRG.014 Orthophoto And Contour Plan (2020-02-12).dwg
CREATED: 22 January 2021 JOB SUB #



CONCRETE AGITATORS

LIGHT VEHICLES

CEMENT / ADMIX TANKERS

AGGREGATE TIPPERS

REVISIONS					
REV	DESCRIPTION	DRAWN	DATE	APPROVED	DATE
N	ITEM 30 EXCLUDED AREA ADDED	S.KINSELLA	22JUL2021		

ALL DIMENSIONS IN m UNO

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LITTLEHAMPTON (Mt. BARKER) CONCRETE PLANT
CONCEPTS
TRAFFIC FLOW

SIZE	FILE NAME	DWG NO	REV
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SCALE NTS	DO NOT SCALE	SHEET 9 OF 9	

Groundwork Plus Pty Ltd Resources Environment Planning Laboratories
Phone: 1800 GW PLUS (1800 497 587)
Email: info@groundwork.com.au
Website: groundwork.com.au
ABN 13 609 422 791

Date: 18 October 2021
Ref: 2452_DA1_320_001

Client Services Officer
Environment Protection Authority
GPO Box 2607
ADELAIDE SA 5001
DX 228
Epa.planning@sa.gov.au

Attention: Hayley Riggs

Dear Hayley

RESPONSE TO ENVIRONMENT PROTECTION AUTHORITY INFORMATON REQUEST

APPLICATION FOR DEVELOPMENT APPROVAL – DEVELOPMENT PLAN CONSENT FOR GENERAL INDUSTRY (CONCRETE BATCHING PLANT) AT 2 CHILDS ROAD, LITTLEHAMPTON, SA 5250, PROPERLY DESCRIBED AS PART OF LOT 98 ON F160275

ENVIRONMENT PROTECTION AUTHORITY REFERENCE: 35044

On behalf of Holcim (Australia) Pty Ltd, the applicant for the abovementioned application, Groundwork Plus provides the following response to the further Information Request letter issued by the Environment Protection Authority (**EPA**) on 22 September 2021.

This letter comprises a response to all of the items requiring additional information as requested by the EPA. It is therefore requested that the EPA proceed with their assessment of the application.

Each item requiring additional information has been re-stated with a corresponding response in sequence below.

Stormwater Management

The EPA considers that discharge from Catchment C off site could only occur if monitoring demonstrates that the water is free of concrete waste and of suitable quality to be discharged. Contingencies for disposal are also required in the event that monitoring identifies that the run-off is not suitable for discharge. The EPA's preference is that this runoff should be retained and re-used on site.

1. *Provide a clear explanation of where runoff in Catchment C would be directed after the first 20mm of rainfall. If this runoff is to be retained on-site for re-use, such as directed to the bio-retention basin, it must be demonstrated that there is sufficient capacity to store the run-off prior to reuse. If this runoff is proposed to be directed off site without treatment, monitoring must be proposed to monitor the pH and turbidity prior to any discharges. The Stormwater Management Plan must be updated to reflect what is proposed.*

Response:
Please refer to the updated Stormwater Management Plan (SMP), in particular Figure 1 being drawing reference: 2452.DRG.008 REV 4.

Figure 1 of the SMP demonstrates through the proposed site grading contours and the details of infrastructure that the first flush waters will be contained in the designated first flush tank (which has been nominated with a storage volume of 40kL, suitable for industry standard). The first flush tank will also be design and maintained in accordance with Holcim's internal guidelines and construction standards; and will be 100% impervious.

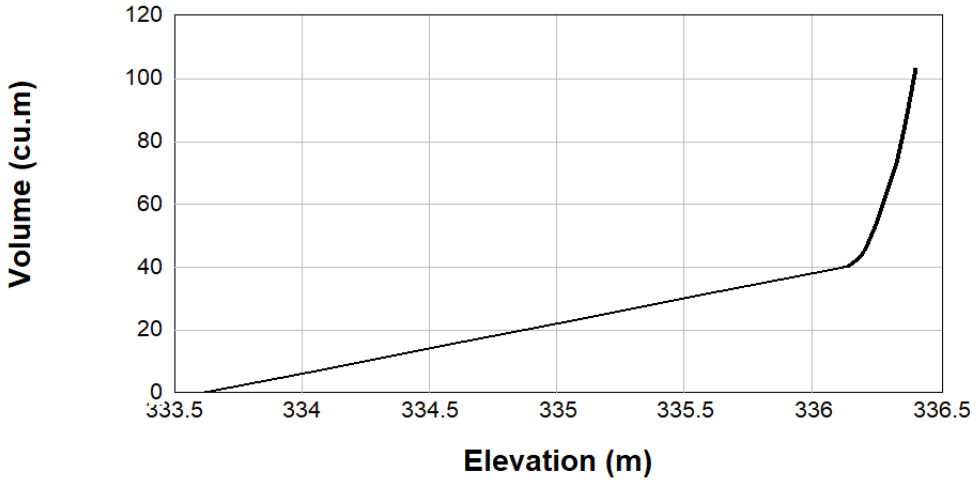
The first flush tank is situated at the lowest point in Catchment C (the top of the tank at RL 336.12), with all contributing catchment areas being directed to this first flush tank via concrete 'v-drains' or channels as shown. It is also noted that not all captured water within Catchment C will be contaminated. However, in adopting a conservative approach, the entire area of Catchment C has been nominated as contaminated for the purpose of sizing the first flush tank.

The nominated pump (10L/s) will return captured water to the stirrer pit, which prevents settling of solids and allows all of this captured water to be recycled back into the concrete batching process. The intent of this infrastructure is to enable the plant to re-use all captured surface water from within Catchment C, consistent with Holcim's operating infrastructure for their other concrete batching plants.

In the event that the first flush tank is full (i.e rainfall events larger than 20mm), the proposed site levels and pavement grading for this area of Catchment C will also contain up to 100kL of additional storage, prior to reporting to the secondary failsafe mechanism on the site which is the proposed bio-retention basin in the south-western corner.

In order to demonstrate to the EPA that the secondary storage area for the first flush pit is of sufficient volume, please refer to Diagram 1 below for details of the pavement surface volume vs elevation, up to RL 336.4, which is the point at which surface waters will sheet flow over the catchment ridge and report to the bio-retention basin.

Diagram 1 – DRAINS modelling for proposed first flush tank and pavement ponding area



Source: DRAINS Modelling based on proposed site contour data.

It is noted in the 1% AEP (critical storm duration) calculations for Catchment C that the area is estimated to contain 50.3kL. Therefore, even in the worse-case scenario if the first flush tank is full prior to the occurrence of a 1% AEP critical storm duration, the pavement area will hold the additional (potentially contaminated) waters prior to discharging to the bio-retention system, with the water level anticipated to correlate to approximately RL 336.24. Therefore, it is confirmed that no discharge will occur from Catchment C either off-site, or to the bio-retention system for all events up to and including a 1% AEP critical storm duration.

As demonstrated by the proposed site pavement contouring and the location of the first flush tank in a sag point, there is adequate storage volume available (in Catchment C) to capture all events up to and including the 1 % AEP critical storm duration. In addition to this failsafe mechanism, the plant intends to re-use all water via the nominated pump and stirrer pit system in accordance with the outcomes desired by the EPA.

Notwithstanding the above approach, Holcim and Groundwork Plus maintain the view that the CCAA industry standard for first flush systems (capturing up to and including the first 20mm) is nationally accepted.

2. *If run-off from Catchment C is proposed to be discharged off-site, provide details of contingencies for disposal or reuse in the event that monitoring identifies that the run-off is not suitable for discharge to the environment.*

Response:
As discussed in the response to item 1, there is no runoff proposed to be discharged off-site from Catchment C, by virtue of the proposed site grading and the installation of the first flush tank in a sag point. As outlined, the total accumulated ponding area storage of 100kL provides adequate capture for all events up to and including the 1% AEP critical storm duration. It is reiterated that all captured waters in Catchment C is intended to be re-used in the operations.

For the highly unlikely scenario where the captured surface water in Catchment C is surplus to needs of the operations or otherwise not able to be reused, the water would be dealt with as 'waste water' and removed from site via a licensed waste removal contractor, where water quality monitoring indicates that the surface water is not suitable for discharge.

Water Quality monitoring of stormwater for the site will be undertaken prior to any discharge in accordance with Schedule 1 of the Environment Protection (Water Quality) Policy, as required by Section 4 of the SMP (Operational Procedures).

3. *Provide details of the volume of water likely to be captured on site in all devices (Sedimentation Basin, Bio-retention Basin, First Flush Tank) compared with the likely volumes of water required for use on site to clearly demonstrate that most (if not all) runoff captured on site would be re-used.*

Response:
As indicated on Figure 1 of the SMP, the sediment basin has 177kL of detention volume, and the first flush tank has 40kL of detention volume. In addition, the bio-retention basin in the south-western corner has 44kL of retention volume, as required to meet the required MUSIC modelling guidelines (as required by Mount Barker District Council).

Based on industry standards, for every cubic metre of concrete produced, 110L of process water is required and the average concrete production is likely to be in the order of 350m^3 per day. Therefore,

on operational days, it is calculated that 38.5kL of water will be required in the production process. Hence, the water captured in the first flush system is anticipated to be recycled back into operations within approximately 24 hours of capture.

We understand that this response addresses all of the matters raised in the further information request letter and look forward to receiving the EPA's determination for this application. If you have any further queries regarding the contents of this response, please do not hesitate to contact me on 1800 497 587, or via email: slyons@groundwork.com.au.

Yours faithfully
Groundwork Plus

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Town Planner

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Enc/s: Attachment 1 – Stormwater Management Plan

Attachment 1

Stormwater Management Plan

GROUNDWORK plus

CONCRETE BATCHING PLANT
LITTLEHAMPTON

STORMWATER MANAGEMENT PLAN

Prepared for:
Holcim (Australia) Pty Ltd

Holcim

Date:
14 October 2021

File Ref:
2452.800.001

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Project/ Report Details

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Engineering Certification

Name	*RPEQ Number*	*Date*	*Signature*
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FIGURES

1 Introduction

1.1 Project Overview

Groundwork Plus has been commissioned by Holcim (Australia) Pty Ltd ('Holcim') to prepare a Stormwater Management Plan ('SMP') for a new concrete batching plant proposed at 2 Childs Road, Littlehampton SA 5250, properly described as part of Lot 98 on F160275 (herein referred to as the 'site').

1.2 Objectives of the SMP

The scope of this SMP includes the following items for the proposed concrete batching plant:

- Details of stormwater quality management systems
- Implementation and maintenance strategy stormwater management measures and systems.

This SMP outlines the engineering design details and operational management procedures that are to be maintained and/or adopted in order to integrate stormwater management into the daily operations.

1.3 Guidelines and Legislation

The principal legislation addressing pollution in South Australia is the Environment Protection Act 1993 (the 'EP Act'), and the Environment Protection (Water Quality) Policy 2015 ('Water Quality Policy') applies to all inland surface and groundwaters, and marine waters. Clause 20 of the Water Quality Policy lists specific obligations relating to concrete batching plants.

Operators must ensure that:

- Waste generated at the premises is not discharged into any waters or onto land in a place from which it is reasonably likely to enter any waters (including by processes such as seepage or infiltration or carriage by wind, rain, sea spray or stormwater or by the rising of the water table);
- the premises incorporate a wastewater management system; and
- the system is effectively operating in respect of any wastewater generated at the premises while the premises are being used for the works.

2. Stormwater Quantity Management

2.1 Stormwater Hydrology

Refer to **Table 1 – Site Catchment Areas** and **Figure 1 – Stormwater Management Plan** for details of the proposed developed catchments and associated surface grading.

Table 1 – Site Catchment Areas

Catchment ID	Catchment Type	Catchment Area (m²)	Discharge Location
A	Dirty	2,170	Wedge Pit A
B	Dirty	2,289	Sediment Basin SB1
C	Contaminated	1,997	First Flush Tank
D	Clean	2,031	Bio-retention BR1

The "Dirty" areas of the site (Catchment A & B) are defined as those delineated catchments which have the potential for general activities and raw material deliveries that contain non-cementitious materials such as dust (generated by vehicle movements), sand and aggregates. Stormwater runoff in these catchments are limited only to pavements, exposed aggregate and sand materials, thus generating possible suspended solids, however these areas are not affected by pH contaminated associated with the concrete batching process.

The "Contaminated" area of the site (Catchment C) is defined as having potential for general activities, cement deliveries, potential spillage and any washdown waters to contain cementitious material, dust, fly ash or other materials used in the concrete batching process. The areas are exclusively defined where stormwater runoff is affected by increased pH associated with the concrete batching process.

The "Clean" area of the site (Catchment D) refers to the driveway (sealed pavement) area which is not prone to runoff associated with concrete batching activities or aggregate storage.

2.1.1 Hydrologic Modelling

Hydrologic modelling was undertaken using DRAINS (a computer simulation program by Watercom). Site-based rainfall polynomial coefficients were obtained using the Intensity-Frequency-Duration ('IFD') generation tool, available on the Bureau of Meteorology's ('BOM') website. The IFD data is shown below in **Table 2 – IFD Data**.

Table 2 – IFD Data

Duration of Rainfall	Annual Exceedance Probability (AEP)						
	63.20%	50%	20%	10%	5%	2%	1%
5 min	53.8	59.9	80.7	96.5	113	138	158
10 min	38.8	43.2	58.5	70.0	82.3	100	115
15 min	31.2	34.8	47.0	56.3	66.2	80.6	92.8
20 min	26.5	29.5	39.9	47.7	56.1	68.3	78.6
25 min	23.3	25.9	35.0	41.8	49.1	59.8	68.8
30 min	20.9	23.2	31.3	37.4	44.0	53.5	61.5
45 min	16.3	18.2	24.4	29.1	34.2	41.5	47.7
1 hour	13.7	15.2	20.4	24.3	28.5	34.6	39.7
1.5 hour	10.7	11.8	15.8	18.9	22.1	26.8	30.7
2 hour	8.95	9.92	13.2	15.8	18.5	22.3	25.6
3 hour	6.98	7.74	10.3	12.3	14.4	17.4	19.9
4.5 hour	5.45	6.04	8.06	9.58	11.2	13.5	15.5
6 hour	4.58	5.07	6.77	8.04	9.4	11.4	13.0

Note: All rainfall intensities measured in mm/hr.

Design storm durations of 5, 10, 15, 20, 25, 30, 45 and 60 minutes were modelled in DRAINS, with the critical storm duration used to determine the peak discharge for each sub-catchment.

2.1.2 Peak Discharge Comparison

A comparison of estimated peak discharge at the site release point (proposed bio-retention basin) is shown in **Table 3 – Peak Discharge Comparison.** Peak discharge was modelled for the critical storm (duration range 5 minutes to 1 hour) of each AEP event as shown, and considers the pre-developed site is 100% grass cover. The DRAINS model also assumes the first flush tank is empty to meet the first flush requirements, and the sediment basin is also maintained with suitable freeboard to retain the upper settling volume (100kL). The total available detention volume included in the system is therefore assumed to be 140kL.

Table 3 – Peak Discharge Comparison

Scenario	Annual Exceedance Probability (AEP)						Peak Discharge
	1%	2%	5%	10%	20%	50%	
Existing	128	99.0	63.0	35.0	2.00	0.00	L/s
Developed	23.0	0.00	0.00	0.00	0.00	0.00	

2.2 First Flush Tank Design Details

The EPA's *Guideline for Air & Water Quality: Concrete Batching (2016)* states that contaminated stormwater and process wastewater should be captured and recycled onsite. The proposed site surface grading is shown in **Figure 1 - Stormwater Management Plan**. The proposed site grading isolates the contaminated catchments from the uncontaminated areas. As demonstrated through the proposed site contours, a first flush tank is located at the low point within Catchment C, at RL 336.12 (approximately).

2.2.1 First Flush Tank Size and Water Harvesting

Details of the location and size of the first flush tank are as shown in **Figure 1 – Stormwater Management Plan.** The size of the first flush tank (40kL) is consistent with the industry recognised standard for concrete batching *Environmental Management Guideline for Concrete Batch Plants (CCAA, 2017)*, capturing the first 20mm of runoff for the contributing area.

A pumping system with 10L/s is proposed to harvest collected water from the first flush tank and direct harvested water to the stirrer pit for reuse in concrete batching activities. The first flush tank will be emptied using the proposed pump system following each rainfall event.

The applicant plans to use all harvested water from the first flush tank, since it is a resource that can be utilised in the concrete batching process. An additional first flush tank can be installed adjacent to the slump stands for additional harvesting and reuse, however this is in addition to the minimum requirements to capture the first 20mm of runoff.

Any installed first flush tanks must be kept empty at all times, to ensure that adequate volume is available prior to a rainfall event occurring, and then emptied as quickly as possible after a rainfall event.

If harvested surface water is surplus to needs of the operations, or otherwise not able to be reused, the water shall be dealt with as 'waste water' and removed from site via a licensed waste removal contractor, where water quality monitoring indicates that the captured surface water is not suitable for discharge. Contaminated water from the first flush system must not be pumped, or released into the stormwater drainage system.

Monitoring of stormwater for the site will be undertaken in accordance with Schedule 1 of the Environment Protection (Water Quality) Policy, as outlined in **Section 4 - Operational Procedures**.

2.3 Wedge Pits and Sediment Basins

The EPA's *Guideline for Air & Water Quality: Concrete Batching (2016)* states that uncontaminated stormwater from building roofs, roads and other paved areas, etc, may be separated from the wastewater collection system and directed through a suitable interceptor or sediment collection system.

As shown on **Figure 1 – Stormwater Management Plan**, wedge pits and sediment basins are proposed to treat the aggregate storage areas (dirty areas) demarcated in Catchments A & B. Further details of the sizing and location of these wedge pits are included in **Section 3 – Stormwater Quality Management**.

2.4 Bio-retention Basin

As shown on **Figure 1 – Stormwater Management Plan**, a bio-retention basin is proposed on the western site discharge point, to provide treatment prior to discharge from the site. Overflows from the wedge pits and sediment basin will discharge into the bio-retention system for additional treatment and is presumed clean. No contaminated discharge from contaminated Catchment C is to be directed into the bio-retention system (or otherwise offsite).

3. Stormwater Quality Management

3.1 Stormwater Quality Objectives

Best Management Practices ('BMP') are required to be demonstrated within the Mount Barker District Council. The following load-reduction targets must be achieved when assessing the post-developed site treatment train (comparison of unmitigated developed case versus developed mitigated case):

- 80% for Total Suspended Solids ('TSS')
- 60% for Total Phosphorous ('TP')
- 45% for Total Nitrogen ('TN')
- 90% for Gross Pollutants ('GP').

Achieving the above Water Quality Objectives ('WQO's) for the site will ensure the environmental values of the downstream urban receiving waters are maintained for the operational phase of the development.

3.2 Stormwater Quality Modelling Approach

3.2.1 MUSIC Model

Water quality modelling has been undertaken for the operational phase using the *Model for Urban Stormwater Improvement Conceptualisation* ('MUSIC') software Version 6.0. A Stormwater Quality Interceptor Device ('SQID') treatment system has been designed and modelled to demonstrate the system effectiveness in achieving the target WQOs.

3.2.2 Rainfall and Evapotranspiration Data

MUSIC modelling was based on six (6) minute interval data obtained from BOM for rainfall station 'Adelaide', as summarised in **Table 4 – Meteorological and Rainfall Runoff Data Reporting Table**.

Table 4 – Meteorological and Rainfall Runoff Data Reporting Table

Input	Data Used in Modelling
Rainfall Station	Adelaide
Time Step	6 minutes
Modelling Period	1/01/1970 to 31/12/1970
Rainfall Runoff Parameters	Urban (Industrial)
Pollutant Export Parameters	Urban (Industrial)

3.2.3 MUSIC Model Catchment Parameters

The site has been modelled as "Urban (Industrial)" for the purposes of MUSIC modelling as detailed in **Table 5 – Catchment Definition Reporting Table**.

Table 5 – Catchment Definition Reporting Table

Catchment ID	Area (ha)	Land Use	Total Impervious Area (%)
Catchment A	0.217	Urban Industrial – Road	100
Catchment B	0.229	Urban Industrial – Road	100
Catchment C	0.199	Urban Industrial – Road	100
Catchment D	0.203	Urban Industrial – Road	100
Total Area	0.853		

3.2.4 Model Parameter Definition

The MUSIC modelling algorithm used to generate urban runoff is based on the data from the *Music Modelling Guidelines, Version 1.0 (Water by Design, 2010)*. The relevant Urban (Industrial) parameters are summarised in **Table 6 – Rainfall Runoff Reporting** and **Table 7 – Pollutant Export Parameters for Urban Industrial Land Use**.

Table 6 – Rainfall Runoff Reporting

Parameter	All Nodes
Land Use	Urban (Industrial)
Rainfall Threshold (mm)	1
Soil Storage Capacity (mm)	18
Initial Storage (% Capacity)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient a	243
Infiltration Capacity Exponent b	0.6
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Baseflow Rate (%)	31
Daily Seepage Rate (%)	0

Table 7 – Pollutant Export Parameters for Urban Industrial Land Use

Flow Type	Surface Type	TSS log^{10} Values		TP log^{10} Values		TN log^{10} Values	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Baseflow Parameters	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Roads	0.78	0.45	-1.11	0.48	0.14	0.20
	Ground Level	0.78	0.45	-1.11	0.48	0.14	0.20
Stormflow Parameters	Roof	1.30	0.44	-0.89	0.36	0.25	0.32
	Roads	2.43	0.44	-0.30	0.36	0.25	0.32
	Ground Level	1.92	0.44	-0.59	0.36	0.25	0.32

3.3 Stormwater Quality Improvement Device (SQID) Treatment System Details

A series of first flush tank, wedge pit and bio-retention basin systems are proposed to meet the WQOs applicable for the site. The MUSIC Model Schematic in Diagram 2 details the catchment routing to the lawful point of discharge. **Table 8 – Bio-retention Basin MUSIC Parameters** summarises the input parameters applied to the MUSIC model for the proposed bio-retention basins. These details will be confirmed during the detailed design phase of the proposed development.

Table 8 – Bio-retention Basin MUSIC Parameters

Design Properties	Details
Extended Detention Depth (m)	0.30
Surface Area (m^2)	185
Filter Area (m^2)	100
Filter Depth (mm)	400
TN Content of Filter Media (mg/kg)	800
Hydraulic conductivity (mm/h)	200

Table 9 – Wedge Pit and Sediment Basin MUSIC Parameters outlines the input parameters used for the proposed wedge pits. No discharge from the first flush tank is assumed, due to the tank capacity and the proposed site grading.

Table 9 – Wedge Pit MUSIC Parameters

Design Properties	Wedge Pit A	Sediment Basin
Surface Area (m^2)	20	134
Extended detention (m)	0.3	1.0
Permanent Pool Volume (m^3)	14	30
Initial Volume (m^3)	14	30

3.4 MUSIC Modelling Results

3.4.1 Treatment Train Effectiveness

Based on the site characteristics and the proposed SQIDs, this assessment has developed an overall concept that will satisfy the requirements of downstream environmental protection. **Diagram 1 – Treatment Train Layout and MUSIC Results** shows a schematic representation of the proposed treatment train elements, while their location within the proposed development is illustrated on the drawings included in **Figure 1 – Stormwater Management Plan**.

The results of the MUSIC Modelling for the treatment train effectiveness are summarised in **Table 10 – Treatment Train Effectiveness**. These results indicate reduction targets for TSS, TP, TN and gross pollutants respectively, are all achieved for the rainfall data set simulated.

Table 10 – Treatment Train Effectiveness

Catchment ID	Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
Site	TSS	853	48.8	94.3	80.0
	TP	1.41	0.348	75.4	60.0
	TN	5.88	2.39	59.4	45.0
	GP	124	0	100	90.0

Note: All simulations have been run with pollutant export estimation set to "stochastic generation".

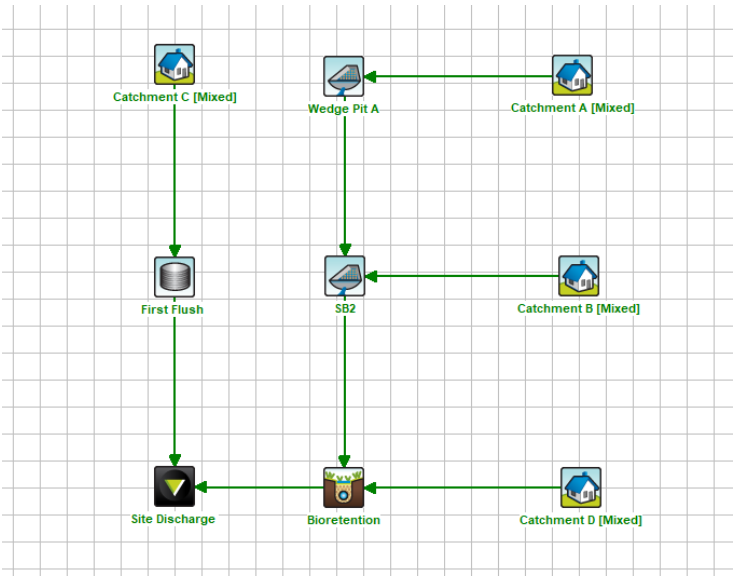


Diagram 1 – Treatment Train Layout and MUSIC Results

4. Operational Procedures

An overview of the proposed Operational Procedures for implementation at the site are summarised below.

Aspect	Details
Purpose	The Operational Procedures have been prepared to manage potential environmental impacts that may result from the operation in relation to stormwater management.
Risk Sources and Potential Impacts	Adverse impacts resulting from current and future operations may include the following: • Contaminated surface water from asphalt plant operations • Overland flows from storage and handling areas of oils, greases and other chemicals; and • Hydrocarbons and chemicals • Construction and maintenance of carpark, roads and hardstands • Spillage during handling of materials • Use and storage of oils, greases and other chemicals.
Performance Targets	It is proposed that the concrete batching plant adheres to the requirements of the Consent conditions and Environmental Protection Agency ('EPA') permit conditions. Monitoring of stormwater from the concrete batching plant will be undertaken in accordance with Schedule 1 of the Environment Protection (Water Quality) Policy.
Responsibilities	The Operations Manager will be primarily responsible for the implementation of this SMP.
Strategies/mitigation measures	***Oil separators, and Bunding of Chemicals*** Clearly designate storage areas and do not deviate from assigned bunded areas for storage of chemicals, unless a suitable secondary bund is provided. Oil separators to be provided where necessary. • All petroleum product storage tanks must be bunded according to AS 1940 and the EPA Guideline *Bunding and Spill Management* (2007) • All empty drums must be stored on a concrete hardstand area with their closures in place • Drains or bunds must be provided to ensure stormwater runoff is excluded from the contaminated area. Storing and handling of hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of: • AS 1692-2006 - Steel tanks for flammable and combustible liquids • AS 3780:2008 – The storage and handling of corrosive substances • AS 1940:2004 – The storage and handling of flammable and combustible liquid • AS 3833:2007 - Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers. ***First Flush Tank & Bunding of contaminated areas*** Operate and maintain proposed first flush tank and pump system in accordance with **Section 2.2 – First Flush Tank Design Details**. • Details of tanks to be noted and maintained • Operations must be carried out in accordance with EPA permit and industry best practice.
Auditing	Stormwater management reviews are required to be carried out on a periodic bases to assess the implementation of the management strategies.

Identification of Incident or Failure	Non-compliance with the performance criteria herein will be identified by: • Stormwater in first flush system exceeds capacity after rainfall event due to insufficient freeboard (40kL volume is required) • Pump system and additional tank not maintained and emptied • Release of contaminants from the site • Poor vegetation establishment • Poorly maintained, damaged or failed stormwater management devices • Uncontrolled release from site • Non-compliant water quality being released from site.
Corrective Action	The Operations Manager shall be responsible for identification of incident or failure and completion of corrective actions. Following identification of incident or failure, the source/cause is to be immediately identified and rectified with records kept to prevent future incidents occurring.
Internal Reporting	A copy of all incidents and complaints will be stored at the site within the incident and complaint register.
External Reporting	Reporting of non-compliance events including discharge of contaminants from the site are to be reported in accordance with Council and EPA requirements.

An inspection and maintenance program should be implemented as detailed in **Table 11 - Inspections and Maintenance of Stormwater and Wastewater Treatment Systems.** A summary schedule of the various inspections, performance criteria and responses that shall be performed on site is shown below.

Table 11 – Inspections and Maintenance of Stormwater and Wastewater Treatment Systems

Device	Minimum Frequency	Performance Criteria	Required Actions
First Flush Tank	Prior to forecast rainfall event, following each rainfall event, and every 2 weeks	• Adequate volume available, all tanks in satisfactory condition, no leaking or damage • No discharge from Catchment C	• Volume to be restored immediately (either reused in operations or removed from site via trade waste facilities) • Any identified damage to be repaired • Maintain pump system
Sediment Basins & Bio-retention	Annually, prior to wet season	• No erosion or blockage of filter media • No weeds	• Eroded areas shall be rehabilitated, filter media shall be replaced once blockages occur • Weeds shall be removed • Water quality to be monitored with reference to EPA / ANZECC
Waste containers	Weekly	• Waste is stored in appropriate containers • Waste receptacles labelled	• Ensure waste material is stored and disposed of properly and in accordance with conditions of the EPA permit and relevant legislative requirements
Spill response stations	Weekly and following use	• Equipment is properly maintained	• Maintain equipment • Replace used equipment
Maintenance area	Weekly	• Fuel, oil spills	• Clean up fuel spills and investigate source
		• Equipment maintenance	• Maintain equipment maintenance records

5. Erosion and Sediment Control - Construction

During construction the site will encounter additional site disturbance as part of the bulk earthworks and construction process. The following construction plan is proposed to manage erosion and sediment risk during construction:

1. Erect Silt fencing along perimeter of site, downstream of where anticipated disturbance activities will be undertaken;
2. Confirm location of bio-retention & first flush tank systems and excavate to volumes and depths required;
3. Ensure excavated soil is placed at the proposed location and protected from cleanwater, with silt fencing erected as required;
4. Undertake site grading and earthworks as required to achieve ultimate operational drainage catchments and construct temporary diversion drains to excavated sediment traps and/or basins.
5. Once hardstand areas are completed (including first flush tank system) and soil disturbance is minimised (i.e at operational completion) treat and release any captured sediment laden water to suitable water quality limits or otherwise remove from site, and infill the bio-retention with the required sand filter media and details shown on **Figure 1 – Stormwater Management Plan.**
6. Establish Sediment Basin 1 and remove any excess topsoil that remains onsite.

All of the above details are shown in **Figure 2 – Erosion and Sediment Control Plan**.

6. Responsibilities

6.1 Monitoring Management Measures

The following management measures will be implemented during facility operations:

- The **Manager** or authorised representative is to regularly inspect the stormwater management devices, particularly prior to forecasted wet weather and following major rainfall events to ensure that these devices are in good working order. All inspections are to be documented (including photos) and available on site at all times.
- The **Manager** shall carry out general surveillance to qualitatively assess stormwater releases from site during discharge events.
- A surface water quality monitoring program may be implemented to assess performance from time to time. Any sampling conducted shall be undertaken by a suitability qualified person.

6.2 Auditing and Review

The effectiveness of the SMP will be reviewed as necessary (e.g. following a change in site operations) and at least once every year. The review shall take into account changes to site activities, available surface water monitoring results, any complaints, pollution incidents and any corrective actions taken.

6.3 Responsibility

The following details the responsibilities with regard to the ongoing operations:

- The **Manager** will be responsible for the implementation of this SMP and for training of site personnel in their responsibilities in relation to this SMP.
- The **Manager** will be responsible for ensuring that all stormwater devices constructed on the site have adequate free water storage capacity.
- All complaints pertaining to water quality received will be recorded in the complaints register/log maintained on-site.
- The **Manager** or a suitably qualified consultant will prepare water monitoring records if and when required by the regulatory authority.
- Records, including results of any monitoring program undertaken on-site, complaints or incidents will be kept on-site for a minimum of five (5) years.

6.4 Identification of Incident or Failure

An incident or failure may include, but not be limited to:

- Deterioration in surface water quality within waters discharged from site
- Receipt of a stormwater quality release complaint
- Not maintaining on-site stormwater controls or treatment devices.

Any identification of incident or failure will be recorded on site.

7. Environmental Incidents

The **Manager** will be responsible for ensuring that all employees at the site are familiar with the procedure for incidents recording. Any employee becoming aware of an incident with actual or potential environmental implications, shall be reported to the **Manager** or delegate immediately.

The **Manager** will notify upper management regarding any environmental incident. An Environmental Incident Report must be completed for all incidents.

Should reporting of an **environmental incident** to the relevant regulatory authority be required, this will be undertaken in accordance with the following.

When an environmental incident occurs, the **Manager** will notify administering authority via telephone and in writing.

The contact details of the administering authority are as follows:

Department for Environment and Water
Phone: +61 8 8204 1910
Email: https://www.environment.sa.gov.au/contact-us

Following notification against this condition, an investigation and further reporting will be required as per Section 6.1 below.

7.1 Investigation

All incidents should be investigated. The investigations should include:

- Determining what activities were being carried out at the time of the complaint/incident and any equipment involved.
- Identifying whether equipment or activities on-site were the cause of the incident or complaint.
- Determining what potential actions may be carried out to resolve the matter and/or minimise the likelihood of further impacts.

An assessment is to be conducted to determine what corrective actions are to be taken to remedy the matter and/or prevent a similar incident from occurring in the future. If monitoring is to be undertaken to investigate an incident or complaint these results should be supplied with the final report to the administering authority.

7.2 Reporting

A written notice detailing the following information may need to be provided to the administering authority, following the initial notification**.** General information likely to be required for any further reporting to the administering authority may include the following:

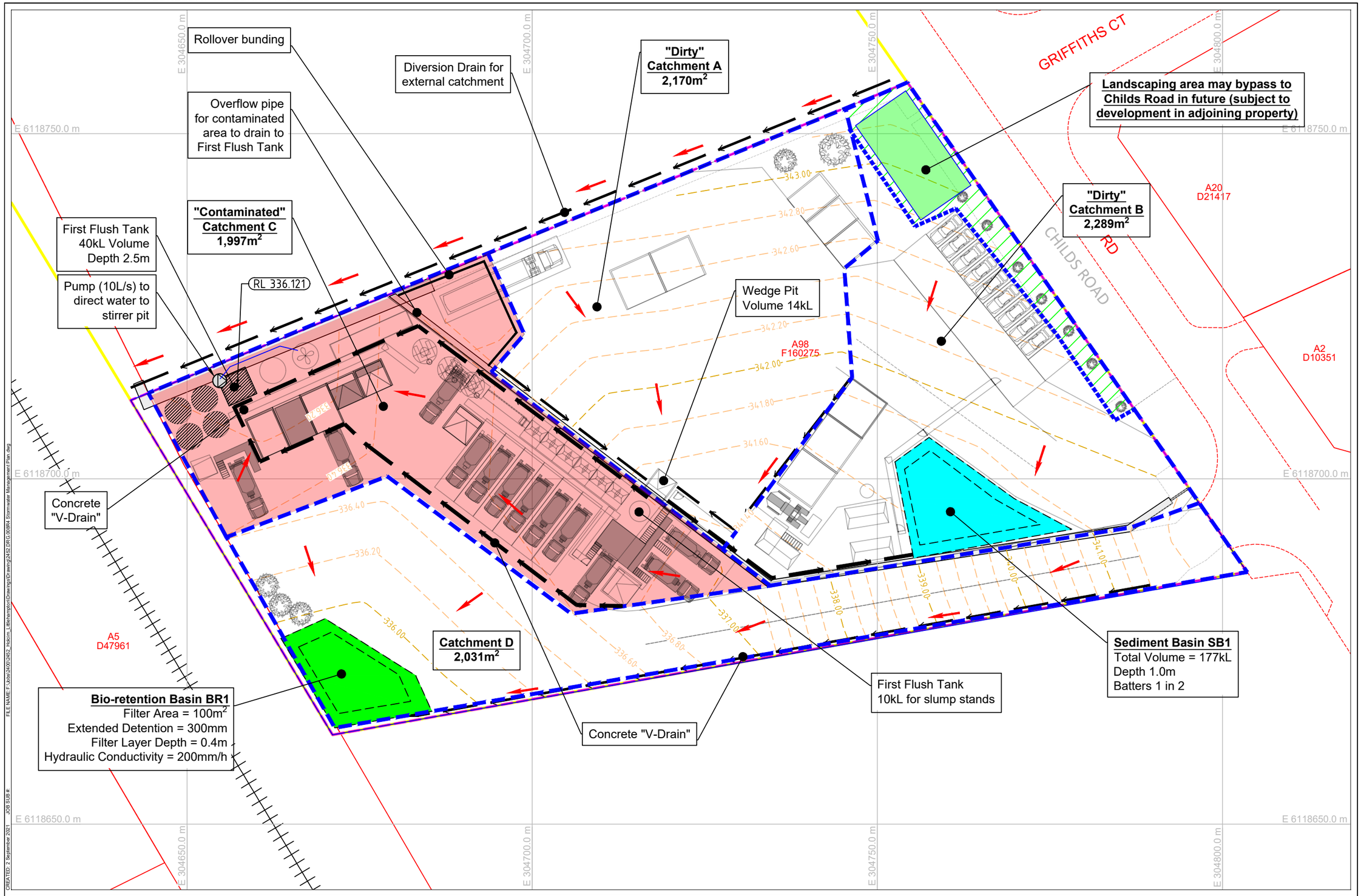
- The name of the operator
- The name and telephone number of a designated contact person
- A description of the event
- The results of any monitoring performed in relation to the event
- Actions taken to mitigate any environmental harm caused by the event
- Proposed actions to prevent a recurrence of the event.

8. Conclusion

This SMP outlines the appropriate treatment measures and operational procedures to be adopted to integrate adequate stormwater management into the daily operations and the site activities. Specifically, this document has been prepared to ensure that appropriate measures have been developed to meet the requirements of industry best practice.

Operational procedures outlined in this SMP will assist to ensure compliance as a minimum standard.

figures



REV	DESCRIPTION	DATE	BY
4	UPDATED FOR EPA REQUEST FOR INFORMATION	08.09.21	MAF
3	UPDATED FOR COUNCIL REQUEST FOR INFORMATION	27.07.21	MAF
2	ISSUED FOR APPROVAL	01.02.21	MAF

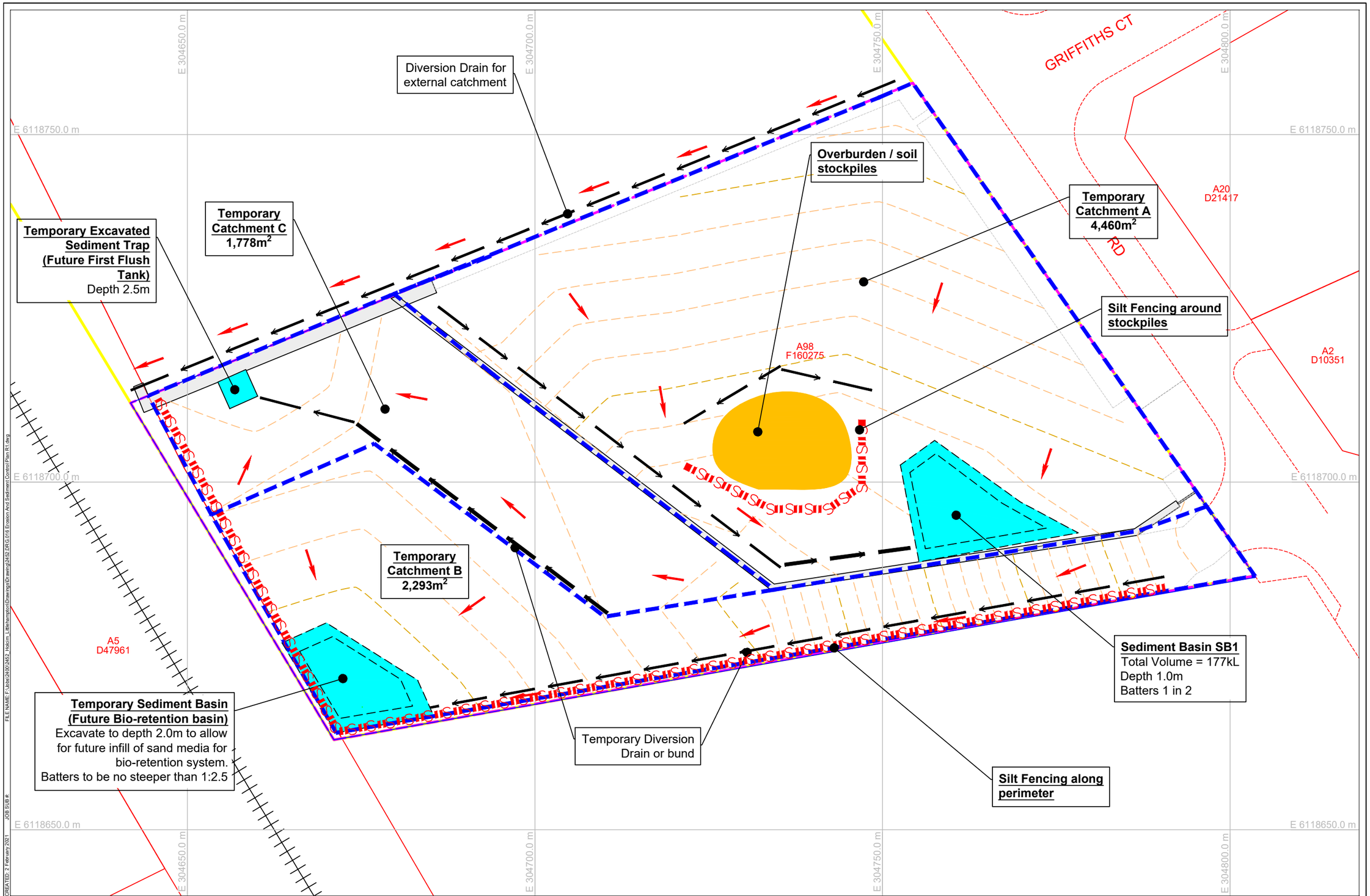
Data Sources:
Photography: Groundwork Plus UAV Survey, Captured 2020-02-17
Topography: Groundwork Plus UAV Survey, Captured 2020-02-17
Cadastre: © The Government of South Australia (DPTI) 2020
Ecosystem:
SRTM: © Commonwealth of Australia (Geoscience Australia) 2011

Legend:
- Site Boundary
- Cadastral Boundary
- Rail Line
- Proposed Lease Area (8,677m²)
- Existing Retaining Wall
- Staffed Building
- Light Vehicle Traffic
- Heavy Vehicle Traffic
- Walkway
- Physical Barrier
- Landscaping
- Pump

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton
TITLE: Figure 1 - Stormwater Management Plan

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:500 When Printed On A3 (0 — 10m)
DRAWING NUMBER: 2452.DRG.008
REVISION: 4
DATE: 2 September 2021
DRAWN: JHV
DATUM: HORIZONTAL / VERTICAL / ZONE
PRINTED: 8 September 2021
CHECKED: JT
GDA94 / MGA / AHD / 54



REV	DESCRIPTION	DATE	BY

Data Sources:
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- Light Vehicle Traffic
- Heavy Vehicle Traffic
- Walkway
- Physical Barrier
- Landscaping

PROJECT: Holcim Australia Pty Ltd
CLIENT: Littlehampton
TITLE: Figure 2 - Erosion and Sediment Control Plan

GROUNDWORK plus
PH: +61 7 3871 0411
WWW.GROUNDWORK.COM.AU

SCALE: 1:500 When Printed On A3 (0 – 10m)
DRAWING NUMBER: 2452.DRG.016
REVISION: 1
DATE: 2 February 2021 DRAWN: JHV
PRINTED: 2 February 2021 CHECKED: JT
DATUM: HORIZONTAL / VERTICAL / ZONE GDA94 / MGA / AHD / 54

FILE NAME: F:\Jobs\2400\2452_Holcim_Littlehampton\Drawings\Drawings\2452.DRG.016 Erosion And Sediment Control Plan R1.dwg
JOB SUB #:
CREATED: 2 February 2021

Holcim Site Signage

Entrance Signage

Standard Recommended Size - 2400mm x 1200mm

Part No: 000EB-24x12-N-288-S

Alternative Size - 1800mm x 1200mm

Part No: 000EB-18x12-N-216-S

Example: 1 site, 1 location

Example: 2 sites, 1 location

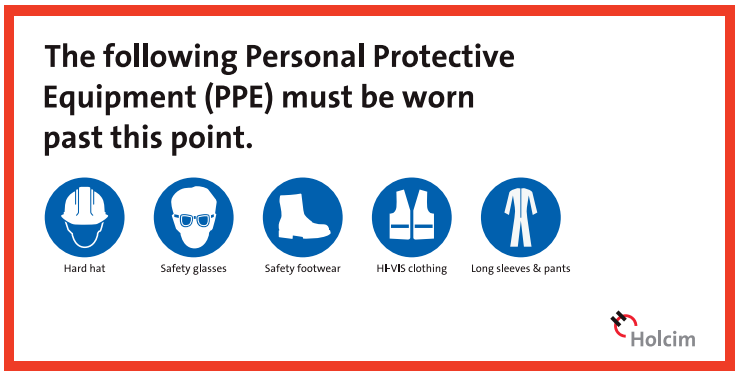
***Note:** Not to scale

Holcim Site Signage

PPE Icon Signage

Primary PPE Signs
Standard Recommended Size - 2400mm x 1200mm

PREVIOUS

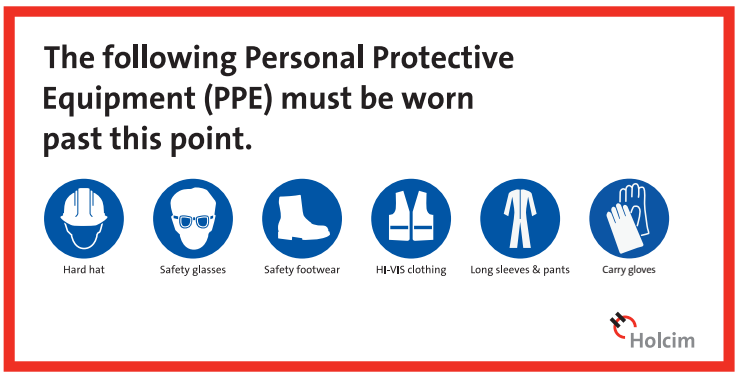


Part No: 001PP-24x12-N-288-S

DECAL REQUIRED

332mm X 325mm

EXISTING



Part No: 001PP-24x12-N-288-S

Littlehampton Concrete Plant

Design Criteria – Branding

Document Number:	9050-R-AR-DC-005
Revision:	A
Author:	Stuart Kinsella
Date:	24 March 2021
Business Unit:	Holcim (Australia) Pty Ltd
Document Owner: (Role/Team)	PM&E Team
Project No: (If Applicable)	
Project Name: (If Applicable)	Littlehampton Concrete Plant

NOTE: This document is controlled by the Document Owner, as defined in the above table, and may only to be modified with permission of the document owner. Please refer all requests accordingly.

Rev	Description	Reviewed/Approved	Signature	Date
A	Draft for comment			

Contents

1

1 General

1.1 Purpose

This document defines the branding (colours) to be used on all structures and buildings.

1.2 Scope

This specification is restricted to the buildings and structures to be erected for the Littlehampton Concrete Plant (the Project).

It does not include:

- Signage; and
- Truck branding.

1.3 References

1.3.1 Referenced standards and codes

AS 2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings

1.3.2 Holcim standards, specifications and codes of practice

0000-Z-ME-SP-002	Painting & Protective Coatings Specification

2 Design criteria

2.1 Coating specification

Holcim coating specification 0000-Z-ME-SP-002 “Painting & Protective Coatings Specification” shall be used throughout the Project unless agreed otherwise in writing.

The following definitions are made in accordance with AS 2312:

Durability:	Very long term (15~25 years)
Atmospheric corrosion category:	C3 (Medium)

2.2 Branding

The branding (colours) shown in Table 1 shall be applied throughout the Project. Alternate colours may be offered if these colours are not readily available in the country of origin. Galvanised steel shall not be painted other than when used for handrails. Figure 1 shows the colour scheme applied to a typical shed.

Table 1. Colour scheme

Item	Colour
Steel structures, building wall cladding	ColorBond® Windspray® RAL 7000 Squirrel Grey Galvanised steel
Handrails	Y14 Golden Yellow
Guttering, down pipes, flashing (opening and corner), gable end capping	ColorBond® Basalt®
Building roofs	ColorBond® Surfmist®

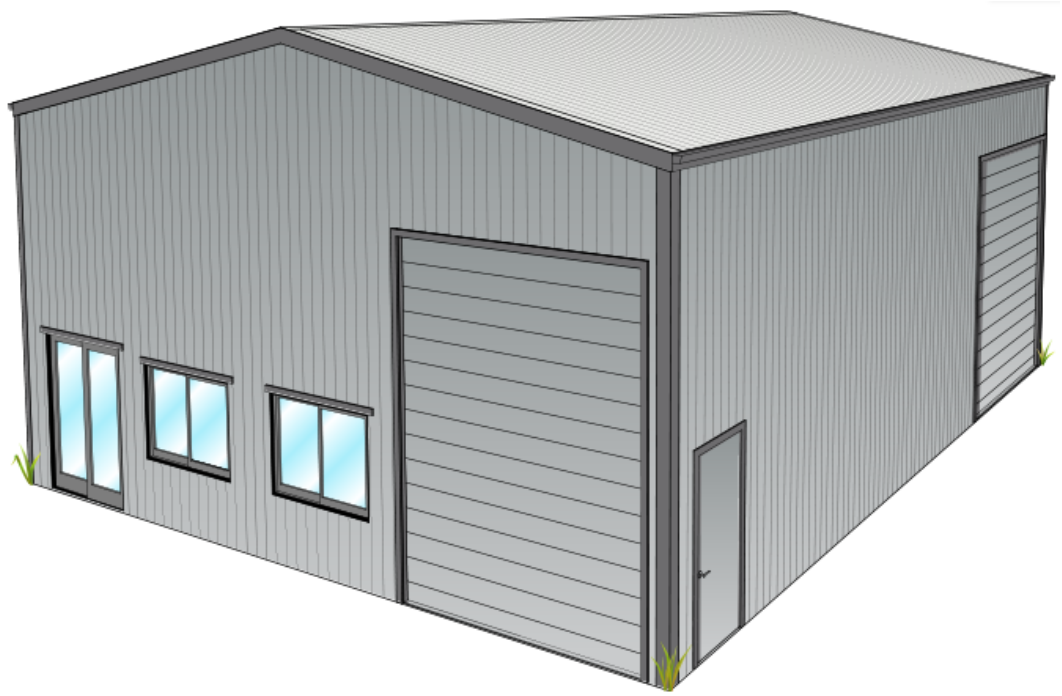


Figure 1. Colour scheme for building.

2.3 Note on colours

The ColorBond® range of colours is widely available in Australia for pre-coated steel (for example roof and wall cladding) and as a paint. This range of colours shall be used in preference to custom formulated colours (for example Squirrel Grey that is the official Holcim brand colour). Table 2 compares these colours: ColorBond® Windspray® is the colour in the ColorBond® range closest to RAL 7000 Squirrel Grey when compared using the RGB colour model.

Colour information is taken from:

https://encycolorpedia.com/78858b

Table 2. Comparison of colours using RGB colour model

Colour	Red	Green	Blue
ColorBond® Windspray®	50.20%	52.55%	51.76%
RAL 7000 Squirrel Grey	47.06%	52.16%	54.51%

Site Photos

View of site and entrance to Childs Road-(lower level of the site)

View of the site – Looking west (upper level)

View of Childs Road and site – Looking North West

Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
211 Victoria Square Adelaide SA 5000
T (08) 8204 2004
Country areas 1800 623 445

EPA Reference: 35044

10 November 2021

Ms Sandra Mann
Development Support Officer
District Council of Mount Barker
PO Box 54
MOUNT BARKER SA 5251

Dear Ms Mann

DIRECTION - Activities of Major Environmental Significance

Development Application No.	580/292/21
Applicant	Holcim (Australia) Pty Ltd (Groundwork Plus)
Location	A98 FP160275 HD Macclesfield, 2 Childs Road, Littlehampton SA 5250
Activity of Environmental Significance	Schedule 8 Item 11; Schedule 22 Part A Activities, Item 22-2(5)
Proposal	Partial change of land use to a Concrete Batching Plant with associated structures, offices, amenities, carparking and landscaping. (Non-Complying)

Decision Notification	A copy of the decision notification must be forwarded to: Client Services Officer Environment Protection Authority GPO Box 2607 ADELAIDE SA 5001

I refer to the above development application forwarded to the Environment Protection Authority (EPA) in accordance with Section 37 of the *Development Act 1993*. The proposed development involves an activity of major environmental significance as described above.

The following response is provided in accordance with Section 37(4)(b)(ii) of the *Development Act 1993* and Schedule 8 Item 11 of the *Development Regulations 2008*.

In determining this response the EPA had regard to and sought to further the objects of the *Environment Protection Act 1993*, and also had regard to:

- the General Environmental Duty, as defined in Part 4, Section 25 (1) of the Act; and

- relevant Environment Protection Policies made under Part 5 of the Act.

Please direct all queries relating to the contents of this correspondence to Courtney Stollznow on telephone (08) 8204 9402 or facsimile (08) 8124 4673 or email Courtney.Stollznow@epa.sa.gov.au.

THE PROPOSAL

The proposal is for a partial change of land use to a concrete batching plant with associated structures, offices, amenities, carparking and landscaping.

The proposed maximum annual production rate of 70,000 tonnes per year.

More specifically, the proposed development included:

- raw materials (sand and gravel) transported to the site in heavy vehicles (truck and dog)
- aggregate and sand delivered to the holding hoppers by front end loaders in the upper level of the site
- aggregate materials weighed via weigh hoppers, located directly beneath the material holding hoppers
- cement, fly ash and other cementitious materials delivered in tankers and pneumatically blown into the proposed silos
- cementitious material held in the proposed silos and then discharged via weigh hoppers, directly into transit mixers.

The proposed hours of operation of the concrete batching plant are 24 hours a day, seven days per week. The delivery of raw materials (including cement and aggregates) would be limited to 7am to 10pm.

SITE DESCRIPTION

The site of the proposed development is 2 Childs Road, Littlehampton, comprising Allotment 98 within 160275 Hundred of Macclesfield.

The subject land is located within the Light Industry Zone as specified in the Mount Barker District Council Development Plan.

Surrounding uses to the north and east of the site comprise vacant industrial land. The South Eastern Freeway is located to the south of the site. An open space/reserve is located immediately to the west of the site, which includes facilities for a radio-controlled car track. Further to the west, on the other side of Adelaide Road there are a number of other commercial/light industrial uses.

Residential dwellings are located further to the south across the South Eastern Freeway and to the north/east, over the hill crest. The nearest receptor is located approximately 170 metres from the boundary of the site, however does not have line of sight, due to the raised elevation of the freeway and the crest of the hill in between.

CONSIDERATION

Advice in this letter includes consideration of the location with respect to existing land uses and is aimed at protecting the environment and avoiding potential adverse impacts upon the locality.

The EPA assessment criteria are outlined in section 57 of the Environment Protection Act (EP Act) and include the objects of the EP Act, the general environmental duty, relevant Environment Protection Policies and the waste strategy for the State.

Environmental Issues

Interface Between Land Uses

The EPA publication *Evaluation distances for effective air quality and noise management* (ED publication) recommends an evaluation distance of 200 metres between a concrete batching plant and a sensitive receiver.

This evaluation distance is to minimise impacts from dust (vehicle movements, delivery of materials, loading of hoppers and trucks) and noise (loading/unloading of materials, vehicle movements, plant noise etc) on sensitive receivers (e.g. dwellings).

The nearest sensitive receiver is located approximately 170 metres from the proposed concrete batching plant. As such, air quality and noise management are considered in more detail below.

The ED publication can be found at: http://www.epa.sa.gov.au/files/12193_eval_distances.pdf .

Air Quality

Air quality consideration for concrete batching facilities include, dust generation from vehicle movements on unsealed working areas, disturbance by vehicles of cement and aggregate dust on the ground, blow-outs from cement storage silos, and vehicles loading and unloading. There is also the potential for dust generation with delivery of sand and aggregates, cement and fly ash, loading of aggregate weigh-hoppers and loading of trucks.

The EPA is satisfied with the following proposed standard strategies to reduce dust:

- work areas would be dampened down, all trafficable areas on site would be paved and/or sealed, good housekeeping
- use of dust suppressants and shielding to silos/storage bins where possible, cement and fly ash silos fitted with overfill protection and dust filtration systems, and properly maintain the systems and filters, use a burst bag detector system that has ducting to 1 metre of ground level adjacent to the silo-filling pipe.
- to minimise transportation of materials incoming and outgoing truckloads would be covered, trucks leaving the premises would be clean and truck loading bays roofed and enclosed.

A condition is directed below to ensure that prior to operation the cement silo is fitted with filling exhaust filters, high/low alarms, overfill protection and an independent fail safe system consisting of a fully ducted and enclosed pressure release valve.

Noise

Concrete batching works commonly operate in the early hours of the morning (prior to 7am) so that concrete can be poured before the ambient daytime temperature warms. Sources of noise may include

loading/unloading of materials, associated vehicle movements (including reversing beepers), the vibration of the concrete agitator and general machine noise from the batching plant.

It is noted that that sensitive receivers (dwellings) are located approximately 240m to the north and east in the Residential Zone and approximately 170m to the south also in the Residential Zone. A sensitive receiver (dwelling) is also located to the north-east in the Rural Landscape Protection Zone and a school in the south-west in the Community Zone.

Proposed operating hours of the site are 24 hours per day, seven days per week. Distribution of concrete would occur from 5am to 10pm on any day. Noise producing activities at the site are identified as including the operation of plant onsite and loading of materials and heavy vehicle movements.

A noise report prepared by WSP titled *Holcim Littlehampton Concrete Plant Development Application Acoustic Assessment* dated 20 January 2021 was provided with the development application.

The noise report proposed a noise management plan including the following features to minimise the impacts of noise from the site:

- broadband reversing alarms to be used where possible to avoid potential nuisance associated with tonal characteristics of traditional reverse beepers
- ensure a site layout that enables product delivery and handling in such a way that reduces the need for reversing
- fixed engines, pumps and compressors to be enclosed where practicable
- ensure all site equipment, machinery and vehicles are serviced in accordance with the original equipment manufacturers' specifications as a minimum
- ensure all modern mobile plant (e.g. front-end loaders, agitator trucks) are fitted with effective exhaust silencers
- equipment and machinery to be shut down when not in use
- unnecessary operation of plant and equipment and revving of mobile or stationary motors and engines to be avoided
- ensure that equipment at the site is used for the intended purpose
- ensure that any extraneous noises are rectified
- maintain hardstand surfaces in good condition (e.g. free of potholes and product spillages) and with suitable grades
- avoid the use of compression braking on product delivery trucks entering the site
- maintain a system for capturing and addressing complaints.

Penalties for noise characteristics were considered in the noise report and their absence has been justified by WSP. The noise report indicated that noise from the site would be compliant at all receivers for day-time noise, and compliant with the noise criteria without mitigation at about half of the receivers for night-time noise. Consequently, noise mitigation is required, and the noise report shows that without deliveries to the site (concrete tanker and quarry aggregate deliveries) during night time hours the proposed activity would meet the noise criteria.

With the proposed mitigation strategy of not permitting concrete tanker or quarry aggregate deliveries during the night-time period (10pm on any day until 7am on the next day) the noise report demonstrates compliance with the noise criteria. This is satisfactory to the EPA and a condition is directed below in this regard.

Waste Management

Any residual concrete material is proposed to be poured into block moulds or washed out of the agitator bowls within the designated washout area. The solid waste material would be collected and stored in drying pits / solid waste bins and this material would then be either recycled or disposed of by a licensed waste contractor. This is satisfactory to the EPA.

Water Quality

Stormwater Management

The proposed stormwater management at the site is outlined in the *Stormwater Management Plan* prepared by Groundwork Plus, dated October 2021 and the letter from Groundwork Plus (Sam Lyons) to the EPA titled *Response to Environment Protection Authority Information Request,* dated 18 October, 2021.

The site has been divided into four stormwater catchments being A, B, C and D. Catchment C is considered to represent the highest risks to stormwater. To manage stormwater from catchment C a 40kL first-flush tank is proposed to be located at the lowest point in the catchment and would capture the first 20mm of rain. All stormwater in catchment C would be directed to this tank via v-drains or channels. This water would then be pumped to a stirrer pit for re-use on site. Runoff exceeding the volume of the first flush tank would remain within catchment C. The grading of catchment C would allow for an additional 100kL of stormwater to be retained within that area when the first-flush tank is full. A 1%AEP for catchment C equates to 50.3kL, meaning even if the first-flush tank is full and a 1%AEP occurs, catchment C has the capacity to retain all stormwater flows. Runoff from events above this volume would be directed to the bio-retention basin proposed for the south-west corner of the site.

Washdown facilities would be located in catchment C, with all wastewater to be captured and retained within that catchment in the first-flush tank.

The other catchments (A, B and D) have been considered to be dirty areas (e.g aggregate storage area and driveway), rather than contaminated areas, and therefore stormwater has been proposed to be captured and treated via a wedge pit, sedimentation basin and bio-retention basin. The sedimentation basin has been sized for the 5-day 90th percentile flow, in accordance with the International Erosion Control Association (IECA) guidelines. Overflow from both the wedge pit and sedimentation basin would be directed to the bio-retention basin. It has been proposed that any water captured in the first-flush tank as well as the basins would be re-used on site. It is estimated that almost 40kL of water would be needed on a daily basis for operational works. If the volumes of runoff exceed production, the extra water would be removed from site via trade waste.

The proposed stormwater management strategies at the site as satisfactory to the EPA and a condition is directed below to ensure the stormwater system is constructed prior to operation and as proposed.

Further, it is noted that the stormwater commitments in the letter from Groundwork Plus (Sam Lyons) to the EPA titled *Response to Environment Protection Authority Information Request,* dated 18 October, 2021 are not adequately reflected in the *Stormwater Management Plan* prepared by Groundwork Plus, dated October 2021. As such, a note is recommended below advising that the operator should provide a revised Stormwater Management Plan with any EPA licence application.

Erosion control during the construction phase is proposed to include silt fencing downhill of overburden/soil stockpiles, silt fencing along the perimeters of the site, as well as the establishment of temporary diversion drains, bunds and sedimentation basins to manage runoff. This is satisfactory to the EPA and a note is recommended below reminding the applicant of their general environmental duty required under section 25 of the EP Act.

Chemical and Fuel Storage

No fuels, oils or lubricants would be stored on the site. All major maintenance of the plant, including front end loader, heavy vehicles and trucks would be undertaken by an authorised contractor, or taken off site. This is satisfactory to the EPA.

Environmental Authorisation

The operation of a concrete batching plant with a total capacity for production exceeding 0.5 cubic metres per production cycle requires an Environmental Authorisation (EPA Licence) pursuant to the Environment Protection Act. A note is recommended below to remind the applicant of the need to obtain a licence.

CONCLUSION

The proposed development is considered to present low impact to the surrounding environment if constructed and operated according to the information provided. Suitable controls are proposed to control dust and noise emissions and the closed reuse wastewater facilities are suitable, but should be monitored during operation.

DIRECTION

The planning authority is directed to attach the following conditions to any approval:

1. Deliveries from concrete tanker and quarry aggregate trucks must only occur between the hours of 7am and 10pm on any day of the week.
2. Prior to operation, the cement silo must be fitted with filling exhaust filters, high/low alarms and overfill protection kits, and an independent fail safe system consisting of a fully ducted and enclosed pressure release valve.
3. Prior to operation, the stormwater management system must be constructed in accordance with the *Stormwater Management Plan*, prepared by Groundwork Plus, dated October 2021 and the letter from Groundwork Plus (Sam Lyons) to the EPA titled *Response to Environment Protection Authority Information Request*, dated 18 October, 2021 and must include:
    a. a first-flush tank, sized at least 40kL, to be installed to capture stormwater from catchment C
    b. grading in catchment C designed to capture and retain all stormwater generated in that catchment in a 1% AEP rain event
    c. the establishment of a wedge pit, sedimentation basin and bio-retention basin to capture and treat stormwater from catchment A, B and D
    d. any overflow of stormwater from catchment C to be directed to the proposed bio-retention basin
    e. all wastewater from the washdown facilities to be retained in catchment C.

f. captured stormwater is re-used on site as required for operational needs.

The following notes provide important information for the benefit of the applicant and are requested to be included in any approval:

- The applicant is reminded of its general environmental duty, as required by section 25 of the *Environment Protection Act 1993*, to take all reasonable and practicable measures to ensure that the activities on the whole site, including during construction, do not pollute the environment in a way which causes or may cause environmental harm.
- An environmental authorisation in the form of a licence is required for the operation of this development. The applicant is required to contact the Environment Protection Authority before acting on this approval to ascertain licensing requirements. Information on applying for a licence (including licence application forms) can be accessed here: http://www.epa.sa.gov.au/business_and_industry/applying_for_a_licence . A revised Stormwater Management Plan should be included with the licence application which reflects all of the commitments made in the letter from Groundwork Plus titled: *Response to Environment Protection Authority Information Request – Application for Development Approval – Development Plan Consent for General Industry (Concrete Batching Plan) at 2 Childs Road, Littlehampton, SA, 5250,* dated 18 October 2021.
- A licence may be refused where the applicant has failed to comply with any conditions of development approval imposed at the direction of the Environment Protection Authority.
- EPA information sheets, guidelines documents, codes of practice, technical bulletins etc can be accessed on the following web site: http://www.epa.sa.gov.au

Yours faithfully

Hayley Riggs
Delegate
ENVIRONMENT PROTECTION AUTHORITY

5.1.2. CATEGORY 3 APPLICATIONS
Nil.

5.1.3. CATEGORY 2 APPLICATIONS
Nil.

5.1.4. CATEGORY 1 APPLICATIONS
Nil.

5.2. PLANNING, DEVELOPMENT AND INFRASTRUCTURE ACT APPLICATIONS
Nil.

6. REVIEW OF ASSESSMENT MANAGER DECISIONS
Nil

7. INFORMATION REPORTS
Nil.

8. CONFIDENTIAL REPORTS
Nil.

9. POLICY MATTERS ARISING FROM THIS AGENDA

10. OTHER BUSINESS

11. CLOSE