



Application for Licence Amendment

Division 3, Part V *Environmental Protection Act 1986*

Licence Number	L6533/1993/11
Applicant	BGC (Australia) Pty Ltd
ACN	005 736 005
File Number	DEC14303
Premises	<p>BGC Hazelmere Industrial Complex Corner Bushmead Road and Stirling Crescent HAZELMERE WA 6055</p> <p>Legal description - Lot 4 on Diagram 55932 Certificate of Title Volume 1978 Folio 979 Lot 800 on Deposited Plan 408214 Certificate of Title Volume 2924 Folio 462 Lot 202 on Deposited Plan 39720 Certificate of Title Volume 2573 Folio 193 Lot 76 on Plan 4539 Certificate of Title Volume 1674 Folio 164</p>
Date of Report	13 December 2017
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1 Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	<i>Contaminated Sites Act 2003 (WA)</i>
dB	decibel, a unit of measurement of sound level
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DGS Act	<i>Dangerous Goods and Safety Act 2004</i>
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of, and during this Review
FIDOL	means with respect to odour assessment - frequency, intensity, duration, offensiveness and location
ICMS	Incident and Complaints Management System

NEPM	National Environmental Protection Measure
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
NPI	National Pollutant Inventory
Occupier	has the same meaning given to that term under the EP Act.
PDWSA	Public Drinking Water Source Area
PM	Particulate Matter
PM ₁₀	used to describe particulate matter that is smaller than 10 microns (µm) in diameter
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the Premises to which this Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Review	this Licence review
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act following the finalisation of this Review.
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i>
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>

2 Purpose and scope of assessment

BGC (Australia) Pty Ltd (the Applicant) submitted an application for an amendment to their Existing Licence on 9 August 2017. The Existing Licence is for Category 35 – Asphalt Manufacturing undertaken within Lot 4 on Plan 55932. The Applicant holds registration (R964) for Category 77 for operating the concrete batching plant, also located within Lot 4 on Plan 55932.

Other prescribed activities currently being undertaken by the Applicant at their Hazelmere operations include the manufacturing of cement blocks (facility constructed in accordance with a works approval) and the following additional activities: which were not constructed under a works approval:

- Category 77 - Cement products (pavers) manufacturing within Lots 4 and 800; and
- Category 61A – Solid Waste Facility (Storage of broken/downgrade/malformed products and waste/excess batched concrete for crushing and screening within Lot 76).

The Applicant is seeking to update the Prescribed Premises boundary and consolidate all existing prescribed activities spread across the above mentioned four adjacent Lots in BGC Hazelmere Industrial Complex. The Applicant also proposes to temporarily install, commission and operate two additional transportable asphalt manufacturing plants for a period of approximately 20 months and to upgrade the waste products crushing and screening plant on the Premises.

This Decision Report includes assessment of emissions and discharges during construction, commissioning and operation from the existing and proposed prescribed activities on the Premises in accordance with the Department's *Guidance Statement: Risk Assessment*.

2.1 Application details

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
BGC Licence Amendment Application Form	9/08/2017
BGC Hazelmere Industrial Complex - Supporting Document Licence Amendment L6533/1993/11	
E-mail correspondence from Carl Barrett, BGC Group Manager Energy & Environment including following documents: Appendix 1- Emission estimates of hot mix asphalt production with reference to USEPA AP-42; Appendix 2,3,4 – Emissions data from asphalt plants comparable to those proposed to be installed onsite; Appendix 5- Dust Management Plan, BGC Hazelmere, October 2017; Appendix 6a and 6b- Operational Risk Assessment (Dust) and Risk Register; Appendix 7- Drawing indicating proposed location of additional bitumen and diesel tanks; and A word document providing response to the Department's Information Request letter dated 19 September 2017	11/10/2017
Environmental Noise Assessment BGC Industrial Complex, Hazelmere, authored by Lloyd George Acoustics	1/11/2017
Odour Emissions Operations Review BGC Hazelmere Industrial Complex, dated November 2017	8/11/2017

3 Background

BGC (Australia) Pty Ltd (BGC) was first issued a Licence to conduct asphalt manufacturing activity within Lot 4 in 1993. Prior to this, the concrete batching plant within Lot 4 was built under a works approval issued in 1997 with the registration for this plant (R964) issued under the EP Regulations on 19 May 1998. The stone / cement block manufacturing plant was built under a works approval issued in 2001 but was not subsequently registered after the works were completed.

Table 3 lists the Prescribed Premises Categories that have been applied for.

Table 3: Prescribed Premises Categories in the Revised Licence

Classification of Premises	Description	Activity undertaken at Hazelmere Industrial Complex	Approved Premises production or design capacity or throughput
Category 35	Asphalt manufacturing	Existing fixed plant	250,000 tonnes per annum
		Temporary transportable plants (2)	1,095,000 tonnes per annum
Category 61A	Solid waste facility	Receiving off-specification or malformed products from BGC manufacturing sites in Perth Metropolitan area for crushing and screening; and/or Off-specification or malformed products from operations conducted within the Premises and recycled waste from concrete batching	30,000 tonnes per annum
Category 77	Concrete batching or cement products manufacturing: Premises on which cement products or concrete are manufactured for use at places or Premises other than those Premises	Batching plant	360,000 tonnes per annum
		Cement pavers and cement/stone block manufacturing	350,000 tonnes per annum

Figure 1 below shows the revised Prescribed Premises boundary defining the four adjacent Lots.



Figure 1: BGC Hazelmere Industrial Complex Premises Boundary

4 Overview of Premises

4.1 Operational aspects

4.1.1 Current operations

4.1.1.1 Raw material delivery and storage

Raw aggregates for use in asphalt manufacturing and other raw materials including cement, sand, aggregate and additives used in concrete batching and cement products manufacturing operations are delivered to the Premises in trucks via the Stirling Crescent entrance. Delivery trucks are covered with a tarpaulin that can be activated electronically or manually. The Applicant has indicated that aggregates are pre-moistened at the source prior to being delivered onsite.

Aggregates are tipped from the trucks onto the floor and then loaded into material bins, according to the aggregate grade, using front end loaders. Material bins for asphalt aggregate storage are three sided and most bins are fitted with windshields and sprinklers. DWER site visit on 27 September 2017 observed that water sprinklers were not installed on material bins which contained larger sized aggregates.

Bitumen is stored in two 44kL heated storage tanks. Bitumen is pumped from the delivery truck to the bitumen tanks via a hose. The bitumen tanks are fitted with high and low level alarms to prevent overflowing and visual instrumentation is installed in the control room to inspect bitumen levels prior to filling.

Cement used in the concrete batching process is delivered by cement tanker and pumped via a hose into the cement storage silos under slight negative pressure. There are four cement storage silos on the Premises comprising 340 tonnes total storage capacity. Displaced air during filling of silos is passed through a baghouse to capture cement dust. Dustcotech filters with an area of 34m² of filter medium are used. The cement storage silos are fitted with high and low-level alarms to prevent overflowing and visual instrumentation is installed in the control room to inspect cement levels prior to filling.

Cement and lime used in the Block Pave manufacturing process is delivered by cement tanker and stored in two silos comprising 240 tonnes of storage. The dry cement is pumped from the tanker via a hose into cement silos under slight negative pressure. During filling of the cement silos, displaced air is passed through a baghouse, fitted with Goyen filters, to capture cement dust.

Cement and lime used in the block manufacturing process is delivered by cement tanker and stored in one of the three silos comprising approximately 146 tonnes storage capacity. The dry cement is pumped from the tanker via a hose into cement silos under slight negative pressure. During filling of the cement silos, displaced air is passed through a baghouse, fitted with Goyen filters, to capture cement dust.

All cement storage silos are fitted with high and low-level alarms to prevent overflowing and visual instrumentation is installed in the control room to inspect cement levels prior to filling.

4.1.1.2 Fixed asphalt plant

The ALmix ALB 2500S/160 batch plant was constructed in 2016. A front-end loader is used to load aggregates from material bins into the cold aggregate hoppers. Aggregates are metered from the hopper onto an enclosed conveyor belt and transported to the natural gas-fired rotary dryer. Hot aggregate leaving the dryer drops into a bucket elevator and is transferred to a set of vibrating screens, where it is classified into different grades and dropped into individual hot bins according to size. To control aggregate size distribution in the final batch mix, the computerised control system opens various hot bins over a weigh hopper until the desired mix and weight are obtained. Concurrent with aggregate being weighed, recovered filler from bag filters and imported filler such as lime are conveyed from filler silos and weighed sequentially in the filler weigh hopper.

Liquid bitumen is pumped from the heated storage tank to a bitumen scale where it is weighed to achieve the desired aggregate-to-liquid asphalt ratio in the final mix. The aggregates and fillers from weigh hoppers are dropped into the twin shaft mixer and dry-mixed for 6-10 seconds. Liquid asphalt is then dropped into the mixer where it is mixed for an additional period of time. Total mixing time is usually less than 60 seconds. Then the hot mix is conveyed to a hot storage silo or is dropped directly into a truck for transport offsite.

The fixed plant typically operates Monday to Friday, 5am to 3pm, with occasional Saturdays or night works. The fixed plant will also process approximately 10kT of 'returned unused asphalt' for the NorthLink 2 Project. No Reclaimed Asphalt Product (RAP) is or will be used in the process.

4.1.1.3 Concrete batching

A front-end loader is used to load aggregates and sand into the feed hopper. The feed hopper is connected to a radial conveyor which has the ability to be moved laterally to fill each overhead feed bin individually. The radial conveyor is fully enclosed and overhead feed bins are covered at the top. Agitator trucks are used to prepare batches of concrete. The trucks

reverse into the loading bays and are loaded with weighed quantities of aggregate, sand and cement which have been dispensed using the automatic control system.

Dust generated from agitator charging is recycled back into the silos via a hooded vacuum. The concrete agitator trucks then move to the slump stand where water is added to adjust the workability of concrete mixture. Additives are stored in tanks which are connected to flow meters, enabling the batch water to be dosed for the correct amount of admixture prior to discharge to the agitator truck. A computerised system is used to monitor operation of the conveyors, material levels in silos, storage bins and admixture tanks. Water used in the process is a mixture of bore water and partially cleaned process wastewater.

Trucks are washed down before leaving the Premises. Agitator trucks returning from jobsites are washed out at the recycle area. Stone and sand drop out in the recycle pit while wash water is vented into one of two above ground settlement tanks connected in series to aid in settling of suspended solids. The partially treated wastewater is stored in two water tanks for reuse in the process. Solid recyclables are reused in the production process for concrete batching or block making operations.

4.1.1.4 Cement product manufacturing - Paver manufacturing operations

Cement and lime is mixed with sand, aggregate and water to form concrete paver blocks. The materials are combined in one of two stationary mixers and the moistened product is then conveyed to a block manufacturing machine, pressed, stacked and cured. Raw materials are transferred in fully enclosed conveyors from the material bins to four traveling weigh hoppers (skips) which feed measured amounts of dry materials to an Oru mixer fitted with a dust collector. All material feeding takes place inside a negatively pressured shed.

A computerised system is used to load measured quantities of aggregate, sand and cement into mixer. The dry product is blended for several minutes. Once the materials are blended, a small amount of water is added to the mixer. Admixture and colouring pigments may also be added at this time. The concrete is then mixed for approximately two minutes.

Mixed moistened product is dispensed from the mixer into the hopper of a Schlosser SV40 block laying machine. At a measured flow rate, the concrete is forced downward into moulds. The compaction is supplemented by hydraulic pressure cylinders and mechanical vibration. Compacted blocks are pushed down and out of the moulds onto a flat steel pallet. The palletised blocks are pushed down and out of the machine and onto a chain conveyor. For some paver types, the pavers pass through a pressurised water wash to expose the aggregate and create texture. The water is captured and reused in the process.

The pallets of pavers are conveyed to an automated stacker for natural curing in an enclosed curing chamber. Once cured, the product is rolled out of the chamber and passed through a robotic packaging line into final pack form. The packs are then placed in storage by forklifts until transferred offsite.

4.1.1.5 Cement product manufacturing - Block manufacturing operations

The plant produces concrete retaining blocks by mixing cement and lime with sand, aggregate and water. A front-end loader is used to load aggregates and sand into two feed hoppers. The feed hoppers provide measured amounts of dry material to an Oru mixer via a fully enclosed radial conveyor. The mixer is fitted with a dust collector.

As required, the mixer is loaded with weighed quantities of aggregate, sand and cement using an automatic control system. The dry product is blended for several minutes and once the material is blended, a small amount of water is added to the mixer. Admixture and colouring pigments may be added at this time. The concrete is then mixed for approximately two minutes. Mixed moistened product is then dispensed from the mixer into the bucket of a front-end loader and transferred to the hopper of the Finlay F44 block laying machine (egg layer). Materials pass through a vibrator into the moulding chamber and are then compacted by the

upper mould head into a block. The block is laid out on the hardstand for curing to its compressive strength and the egg-layer continues on laying out blocks in a production line. Once blocks have reached the desired compressive strength they are collected by forklift for stacking on pallets and are stored prior to transportation offsite.

4.1.1.6 Crushing and screening plant

The Premises currently operates a Brown-Lenox Kue-Ken Jaw with a Symons Cone to crush concrete and other recycled material. During the concrete block making process, a portion of the products become malformed when drying and may not meet the quality or compliance standard required for sale. Malformed products or any final products that do not meet specification for sale are reprocessed back into the manufacturing process to produce blocks. In addition, malformed or off-specification pavers manufactured on the Premises and other unused or waste / returned batch cement product from concrete batching activity is periodically transferred to the recycled materials stockpile and later crushed and screened for block making. Unused process inputs and malformed products from BGC's other business divisions in the Perth metropolitan area (e.g. roof tiles, concrete ready-mix and fibre cement board) are also transported to the Premises to be recycled to produce blocks.

4.1.1.7 Fuel farm and refuelling area

There are three horizontal single walled tanks each with 55kL capacity located inside a double brick walled bund which has an estimated storage capacity of 194.4m³. The tanks are connected in series and have isolation valves. The diesel tanks are filled periodically by a licenced contractor via an unloading hose. Diesel is supplied to three dual-hose bowzers on the various fuel islands via an underground supply line. An electronic fuel management and tank gauging system provides access control and remote tank volume monitoring and stock reconciliation. The Premises has a Dangerous Goods Licence DGS0141123 to store and handle up to 165kL of diesel fuel.

4.1.1.8 Wastewater and stormwater management

The Premises has three unlined compensation basins to contain stormwater runoff. Two are located in the northern portion of Lot 4 and one is located in the north-west corner of Lot 76. Three wedge pits intercept the flow of stormwater and capture any silts and suspended sediments (adjacent to the concrete batching plant). The wedge pits are cleaned periodically. During the site visit conducted in September 2017 it was noted that wash waters from the cement truck wash facilities immediately adjacent to the groundwater bore, flows directly into the compensation basin. Acid is added to wash water for truck cleaning in these wash bays. Stormwater directed to the basin on Lot 76 is not treated.

A truck and plant wash exist on the boundary of Lot 76 and Lot 202. The truck wash water is directed to a lined sump and then pumped through a Clearmake industrial oil-water separator prior to discharging to soak wells on Lot 202. The lined sump is pressure cleaned and associated cleaning and wash and accumulated sediments are removed by a licenced waste contractor.

Wash water generated from truck wash activities on the south west corner of Lot 4 is captured in a concrete collection pit for settling suspended solids and sediments. The wastewater is then directed to the adjacent infiltration basin. The Applicant is reviewing options to enhance efficiency of this system.

4.1.2 Proposed works assessed under the licence amendment application

4.1.2.1 Transportable asphalt plants

The Applicant proposes to temporarily install two transportable asphalt plants on the Premises:

- Almix TP88UF- 250 metric tonne per hour (tph) plant owned by BGC; and
- Astec Portable T-400 six pack plant – 350 metric tonnes per hour (tph) proposed to be leased.

The proposed plants will have a combined maximum production capacity of 3000 tonnes of Hotmix asphalt per day and will arrive on the Premises as pre-assembled units to be mounted on pre-prepared surfaces for stability and configured for site operation at the southern end of Lot 202. (See Figure 4 in Appendix 3). The proposed plants will be fully integrated using cold feed bins, drum dryer/ heater and mixer, burner, control room, silos, load-out and conveyors supported by hot bitumen tanks and a baghouse. Both baghouses typically include a two-level system consisting of a gravity dust collector that removes coarse particulates and an air pulse bag filter system to remove fine particulates. In addition, the Astec plant also includes a cyclone that removes the coarse particles from the airstream prior to fabric filtration. Particulate matter collected in the baghouses will be returned to the manufacturing process.

A diesel powered generator (1200kVA) and three-sided ground bins for aggregate storage will be installed. Deployment and commissioning of the transportable asphalt plants is expected to take approximately 3 months. The transportable asphalt plants are expected to remain in operation at the Premises for up to two years to service the NorthLink project.

Aggregate will be hauled by front end loaders from the aggregate storage bins and dumped into the appropriate feed unit hopper. The material will then be metered from the hoppers onto an enclosed conveyor belt and transported into the diesel fired rotary dryer/mixer. The heater/dryer drums will be equipped with flights designed to shower the aggregate within the drum to promote rapid drying efficiency. Once the aggregate reaches the desired temperature, a measured amount of liquid bitumen will be pumped from a heated storage tank and injected into the heated aggregate. Typical bitumen/aggregate mixing time is expected to be one minute. The hot mix will then be conveyed to hot storage silos or dropped directly into a truck for transport offsite.

No RAP will be used in the process.

4.1.2.2 Operating hours

The proposed asphalt plants are expected to operate 12 hours per day, Monday to Saturday. Additional hours may be required depending on project demand. Asphalt will be delivered during the 12-hour manufacturing cycle. Aggregate and bitumen replenishment is programmed for deliveries over a 24-hour cycle.

4.1.2.3 Modification to crushing and screening plant

The Applicant is proposing to install a custom engineered fibre cement flail to crush and integrate fibre cement material. The new system will comprise a material bin fitted with reticulated sprinklers, a hopper, enclosed loading conveyor and hammer mill.

Output from both the existing crusher and the proposed fibre cement flail (hammer mill) will be blended and contained into one stockpile which will then be used to make (backing) blocks. It is proposed that up to 30,000 tonnes of recyclable material will be processed on the Premises. Up to 25,000 tonnes of this material will be sourced from BGC manufacturing operations (malformed or off-specification roof tiles, fibre cement boards, concrete products only) and up to 5,000 tonnes of material will be sourced from the cement and stone block and paving

operations onsite (off-specification / malformed products).

4.1.2.4 Modifications to material storage bins

The Applicant is proposing to construct the following additional fuel and bitumen storage areas:

- 4 x 45kL litre bitumen tanks (2 for each new temporary plant).
- 1 x 30kL self-bunded diesel tank and 1 x 55kL self-bunded diesel tank.

See Figure 6 in Appendix 3 for proposed locations.

4.2 Infrastructure

The BGC Hazelmere Industrial Complex facility infrastructure, as it relates to Categories 35, 61A and 77 activities, is detailed in Table 4 and with reference to the Site Layout Plan in Figure 2 in Appendix 3. Table 4 lists infrastructure associated with each Prescribed Premises Category.

Table 4: BGC Hazelmere Industrial Complex Facility Infrastructure - Existing Operations

	Infrastructure	Site Plan Reference
Prescribed Activity Category 35- Fixed asphalt plant		
1	Fixed Asphalt Plant (Almix ALB2500S/160 Batch mix asphalt plant) including cold aggregate feed bins, dryer and gas burner, hot mix silos and an enclosed conveyor for raw material transfer	Appendix 3: Figure 3, 5, 6,7
2	Baghouse	
3	Truck loading bays	
4	Bitumen storage tank	
5	Material storage bins	
Prescribed Activity Category 77 – Concrete batching		
1	Four cement storage silos (340 tonnes capacity) for concrete batching operations	Appendix 3: Figure 3
2	Feed hopper and fully enclosed radial conveyor	
3	Concrete batch materials truck loading bay/cells	
4	Plant control room	
5	Slump stand connected to water supply and additives (stored in tanks)	
6	Material storage bins	
8	Truck wash recycle bays x 2	
9	Stone / sand recycle pit	
Directly related activity - Wastewater treatment		
1	Above ground settlement tanks x2 for primary and secondary settling of suspended solids	Not identified on site layout.
2	Above ground wastewater storage tanks (2 x 55,000L) for storage of partly cleaned wastewater prior to re-use in production	
Prescribed Activity Category 77 – Block manufacturing		
1	Three cement and lime storage silos (146 tonnes capacity) for block manufacture	Appendix 3: Figure 3
2	Stationary mixer (Oru mixer) and dust collector	
3	Mobile egg layer (Finlay F44 block laying machine) x 2	

	Infrastructure	Site Plan Reference
4	Radial conveyor	
Prescribed Activity Category 77 – Paver manufacturing		
1	Two cement and lime storage silos (240 tonnes capacity) for paving manufacture	Appendix 3: Figure 3
2	Two stationary mixers	
3	Enclosed conveyors	
4	Schlosser SV40 block laying machine	
Directly related activity – Crushing and screening		
1	Brown-Lenox Kue-Ken Jaw crusher with a Symons Cone	Appendix 3: Figure 3
2	Feed hopper and associated concrete access ramp	
3	Screens with associated conveyors	
4	Radial conveyor	
5.	Skip bin for storing waste removed pre Symons Cone crushing	
6	Power source and control room	
7	Material bay for storing unprocessed materials	
8	Material bays for processed materials stockpiling	
Directly related activities – Truck washing water collection and disposal		
1	Truck wash on boundary of Lot 76 and 202	Not identified on site layout.
2	Truck wash on Lot 4	
3	Lined sump, Clearmake industrial oil-water separator to capture truck wash water from Lot 76 and 202 and soak wells on Lot 202 for disposal of treated truck wash water	
4	Concrete collection pit to capture truck wash water from Lot 4 and infiltration basin for disposal of treated truck wash water	
Directly related activities – Stormwater management		
1	Three compensation basins for stormwater runoff (see section 4.1.1.8)	Appendix 3: Figure 3
2	Three wedge pits to intercept stormwater runoff prior to entering basins located in northern portion of Lot 4	Not identified on site layout.
Directly related activities – Fuel farm / refuelling area		
1	Three horizontal single walled tanks (each 55kL capacity)	Not identified on site layout.

Table 5 specifies infrastructure proposed to be constructed/ installed on the Premises.

Table 5: BGC Hazelmere Industrial Complex Infrastructure - Proposed

	Infrastructure	Site Plan Reference
Prescribed Activity Category 35 –Transportable asphalt plants		
1	Almix TP88UF- 250 metric tonne per hour plant	Appendix 3: Figure 4
2	Astec Portable T-400 six pack plant – 350 metric tonne per hour	
3	Each of the above plant will have integrated cold feed bins, drum dryer/ heater and mixer, burner, control room, silos, load-out and conveyors - including hot bitumen tanks and baghouse	
4	Diesel powered generator (1200kVA)	
5	Three-sided ground bins for aggregate storage	
Directly related activity – Crushing and screening		
1	Fibre cement flail (hammer mill)	Not identified on site layout but will be located adjacent to existing crushing screening plant.
2	Reticulated sprinklers in new material storage bays	
3	Feed Hopper	
4	Enclosed loading conveyor	
Directly related activity – Fuel and bitumen storage		
1	4x45kL bitumen tanks	Appendix 3: Figure 8
2	1x30kL self-bunded diesel tank	
3	1x55kL self-bunded diesel tank	

4.3 Exclusions to the Premises

The Premises has administration buildings, workshops and a truck depot. This assessment does not consider potential impacts from these non-prescribed activities or the disposal of wastewater from ablution facilities from these buildings.

5 Legislative context

Table 6 summarises approvals relevant to the assessment.

Table 6: Relevant approvals and tenure

Legislation	Number	Subsidiary	Approval
<i>Rights in Water and Irrigation Act 1914</i>	GWL 51642(4)	BGC (Australia) Pty Ltd	To take up to 72,250 kilolitres per annum of groundwater.
<i>Dangerous Goods Safety Act 2004</i>	Dangerous Goods Licence DGS0141123	BGC (Australia) Pty Ltd	Store and handle up to 165 kilolitres of diesel fuel

5.1 Contaminated sites

Lot 76 Bushmead Road is one of several lots in Hazelmere (Site ID122) historically noting the presence of lead in groundwater. The site classification status has not been finalised under the *Contaminated Sites Act 2003*.

5.2 Other relevant approvals

5.2.1 Planning approvals

The Premises is in an area zoned 'Industrial Development' under the City of Swan Local Planning Scheme No. 17, as amended on 31 May 2017.

The Premises falls within the Hazelmere Enterprise Area Structure Plan. The City of Swan is currently undergoing an amendment to the Local Planning Scheme 17 and intends to introduce the definition of 'dry industry' in the scheme text which will be applicable to the Premises. Under the proposed Scheme Amendment 84, Lot 202 is to be rezoned to 'General Industrial' with restricted use provisions. The scheme amendment proposes to restrict development in this area to the type which is predicted to generate wastewater intended for disposal on site at a daily volume not exceeding 540 litres per 2000m² of site area.

The Applicant notes that they can satisfy the requirements of proposed amendments to the local planning scheme. The proposed scheme amendment has not been finalised at the time of publishing this assessment. The City of Swan has confirmed that the licence application is consistent with the planning approvals onsite.

5.2.2 Approval under the *Dangerous Goods Safety Act 2004*

The Premises holds Dangerous Goods licence DGS014123 to store and handle up to 165 kiloliters of diesel fuel and 128kL of bitumen. The Applicant is seeking approval from the Department of Mines, Industry Regulation and Safety for additional fuel storage being proposed to support operation of the two proposed transportable asphalt plants.

5.3 Part V of the EP Act

5.3.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations. The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (November 2016)*
- *Guidance Statement: Risk Assessments (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

5.3.2 Works approval and licence history

Table 7 summarises the works approval and licence history for the Premises.

Table 7: Works Approval and Licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
L6533/1993/10	31/01/2011	Licence reissue
L6533/1993/10	19/05/2014	Licence amended to REFIRE format
L6533/1993/11	22/01/2016	Licence reissue
L6533/1993/11	31/03/2016	Licence amendment – licensee initiated for: <ul style="list-style-type: none"> • construction and operation of a new fixed asphalt manufacturing plant which replaced the previous fixed plant on the Premises • replacement of baghouse dust collector; • enclosure of aggregate stockpile bins; and • operation of a temporary mobile asphalt plant for the duration of construction of the fixed asphalt plant
L6533/1993/11	30/05/2017	Licence amendment – licensee initiated for increased production limit for the fixed asphalt plant from 100,000 tonnes per annum to 250,000 tonnes per annum
L6533/1993/11	13/12/2017	This licence amendment – licensee initiated for: <ul style="list-style-type: none"> • changes to the Premises boundary to incorporate concrete batching and cement product manufacturing activities occurring on adjacent land parcels into the licenced Premises boundary; • Installing, commissioning and operating two additional transportable asphalt manufacturing plants and upgrades to crushing screening plant

5.3.3 Compliance inspections and compliance history

Review of DWER's complaints management system shows complaints relating to Premises operations mainly relate to dust and odour emissions associated with asphalt production, concrete batching and cement products manufacturing activities on the Premises. Table 8 summarises recent complaints received.

Table 8: Recent odour complaints relating to Premises operations

Date of complaint	Issue
4/9/17	Odour from asphalt plant. Not verified by the DWER.
20/3/17	Odour from the Premises. Not verified by the DWER.
8/9/16	Odour and fumes from the Premises. Not verified by the DWER.
25/7/16	Bitumen fumes from the Premises. Not verified by the DWER.
5/4/16	Odour and fumes from the Premises. Not verified by the DWER.

Two infringement notices were issued to BGC in 2013 relating to dust emissions and non-compliance with the EP (Concrete Batching and Cement Products Manufacturing) Regulations. It is noted that BGC subsequently undertook upgrades to enclose cement feed

conveyors and cold feed bins and installed sprinklers.

6 Modelling and monitoring data

6.1 Air emissions data for proposed transportable asphalt plants

Expected mass emission rate data for the proposed asphalt plants are included in Table 9 below. The Applicant has indicated that the Almix TP88UF plant is a new plant for which actual stack test results are not available and emission estimates are based on the emission factors specified in USEPA AP-42. Emissions rates for the Astec Portable T-400 six pack plant are based on stack test results sourced from the manufacturer of the plant.

Table 9: Emissions data provided by Applicant

Parameter	Almix TP88UF (estimated from emission factors in USEPA AP42)	Astec Portable T-400 (Ektimo stack test sourced from plant manufacturer)	Existing fixed asphalt plant at Hazelmere Industrial Complex (Ektimo stack test results for February 2017 submitted by BGC)
Total Particulate Matter	62 g/min	Not available	<0.8 g/min (<1mg/m ³)
PM₁₀	43 g/min	4.9 g/min	Not required to be monitored under conditions of previous Licence L6533.
CO	246 g/min	780 g/min	
NO₂	49 g/min	71 g/min	
SO₂	6.5 g/min	6.5 g/min	

The Applicant proposes to refit the proposed transportable asphalt plants with burners that comply with Australian Standards and has suggested that this modification will result in actual stack emission rates that are lower than those provided by the manufacturer of the plant or those derived from emission factors estimates. Both transportable asphalt plants will have a baghouse installed on stacks. The Applicant has informed DWER that they can comply with the emissions to air limit of 50mg/m³ for particulate matter which currently applies to the fixed plant at the Premises.

Key Finding: The Delegated Officer has considered the information in relation to air emissions and has found:

1. The Applicant's claim that modifying burners on the transportable asphalt plants will result in significantly lower emission rates than those predicted remains to be verified. Regulatory controls will be required to manage stack emissions from the proposed asphalt plants.
2. The Applicant has committed to undertake stack monitoring to verify predicted emission rates from the proposed asphalt plants and to comply with the particulate matter limit of 50mg/m³ for stack emissions.

6.2 Noise monitoring and modelling noise emissions

Background noise emissions monitoring was undertaken, between 28 September and 5 October 2017, at three locations surrounding the BGC Hazelmere Industrial Complex to quantify existing background noise levels. Computer modelling was also undertaken to predict noise levels at noise sensitive receptors during operation after the two proposed transportable asphalt plants are moved to the Premises. Table 10 below summarises the results of noise modelling undertaken for day and night time operations.

Table 10: Predicted noise emission levels for day and night time operations

Receptor	Daytime operations		Night time operations	
	Compliance Noise Level ¹	Predicted Noise Level	Compliance Noise Level ¹	Predicted Noise Level
R1	49 dBL _{A10}	47 dBL _{A10}	39 dBL _{A10}	38 dBL _{A10}
R2	53 dBL _{A10}	48 dBL _{A10}	43 dBL _{A10}	37 dBL _{A10}
R3	54 dBL _{A10}	47 dBL _{A10}	44 dBL _{A10}	39 dBL _{A10}
R4	54 dBL _{A10}	47 dBL _{A10}	44 dBL _{A10}	42 dBL _{A10}
R5	49 dBL _{A10}	43 dBL _{A10}	39 dBL _{A10}	31 dBL _{A10}

Note 1: Compliance noise levels have been derived from the assigned level applicable at the receptor as prescribed in the EP (Noise) Regulations and adjusted by -5dB which is considered appropriate criteria for assessment to demonstrate that operations will not significantly contribute to overall noise levels.

Modelling was also undertaken to predict noise emission levels experienced by receptors due to truck movements associated with night time operations. Table 11 summarises the results.

Table 11: Predicted noise emission levels associated with truck movements

Receptor	Night time operations	
	Assigned Noise Level ¹	Predicted Noise Level
R1	54 dBL _{A1}	37 dBL _{A1}
R2	58 dBL _{A1}	38 dBL _{A1}
R3	59 dBL _{A1}	39 dBL _{A1}
R4	59 dBL _{A1}	41 dBL _{A1}
R5	54 dBL _{A1}	39 dBL _{A1}

Note 1: Values include the influencing factor and transport factor at the receiving location.

Key Findings: The Delegated Officer has considered the information in relation to noise emissions monitoring and modelling and has found:

1. Assessment methodology used in noise modelling to predict noise emission levels at receptors and criteria used is appropriate.
2. The noise modelling has been undertaken on the basis that operation of the crushing and screening plant and the block and paving manufacturing activities will not occur during night time.
3. Predicted noise emission levels during operation of the proposed two transportable asphalt plants and cumulative noise emissions from the

Premises will comply with the EP (Noise) Regulations during day and night time and will not significantly contribute to an increase in noise emissions levels at receptors.

7 Consultation

The application for licence amendment was advertised on 4 September 2017 for public consultation. The Delegated Officer also invited comments from commercial receptors located in proximity to the Premises. The City of Swan commented on the Application and raised no issue relating to existing operations or proposed development. The City of Swan response however noted that the Premises falls within the Hazelmere Enterprise Area Structure Plan, currently undergoing an amendment to the City of Swan Local Planning Scheme 17 which intends to introduce the definition of 'dry industry' in the scheme text which will be applicable to the Premises. No other comments were received.

8 Location and siting

8.1 Siting context

The Premises is in the suburb of Hazelmere in an area currently zoned as 'Industrial Development' under the City of Swan Local Planning Scheme No. 17.

8.2 Residential and sensitive premises

The distances to residential and sensitive receptors are detailed in Table 12.

Table 12: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential Premises	Several residences are located within 1000m of the Premises boundary. See Table 13 for details.
Industrial Receptors (Premises not owned/ operated by BGC)	<p>North:</p> <ul style="list-style-type: none"> Toll Ipec and Coco-Cola Amatil Distribution Centre: Less than 50m from the Premises boundary Industrial Premises including Linfox, B&J Catalano: Between 200m-300m from the Premises boundary <p>South:</p> <ul style="list-style-type: none"> Eastern Metropolitan Regional Council: Adjacent parcel of land Talloman: Approximately 100 metres from Premises boundary Industrial Premises (including Centurion Transport, Barmenco, Fulton Hogan, G&V Roberts): Greater than 500m from the Premises boundary <p>East:</p> <ul style="list-style-type: none"> Industrial Premises (including BTP, Regal Transport)- Between 200m-300m <p>West:</p> <ul style="list-style-type: none"> CTI Freightlines: Approximately 200m from the Premises boundary
Major Roads	<p>South: Great Eastern Highway Bypass – approximately 200m from the Premises boundary</p> <p>East: Roe Highway- approximately 600m from the Premises boundary</p>

Table 13 notes nearest residential receptors identified in the Application and their occupancy status as identified by the Applicant.

Table 13: Distance to Residential Receptors from Premises boundary

Lot number	Street	Status	Current zoning	Distance from Premises boundary
300	Vale Road	Occupied	Rural Residential	727m
121	Vale Road	Occupied	Rural Residential	533m
120	Lakes Road	Occupied	Rural Residential	532m
24	Stirling Crescent	Occupied	Special Use, Local Reserve-Local Road	510m
95	Lakes Road	Occupied	Rural Residential	634m
405	Central Avenue	Occupied	Rural Residential, Industrial Development	620m
25	Stirling Crescent	Occupied	Special Use, Industrial Development	496m
23	Stirling Crescent	Occupied	Special Use, Regional Reserve Parks and Recreation	590m
118, 119 and 817	Lakes Road	Unoccupied	Rural Residential	--

Note: Occupancy status information is as provided in the Application and has not been independently verified

8.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted because of activities at, or Emissions and Discharges from, the Premises. The distances to specified ecosystems are shown in Table 14. Table 14 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem. The table has also been modified to align with the *Guidance Statement: Environmental Siting*.

Table 14: Environmental values

Specified ecosystems	Distance from the Premises boundary
Helena River (Regional Reserve)	1.1 km North of Premises
Conservation Category Wetland (Helena River Foreshore)	850m
Bush Forever Site 481	750m
Bush Forever Site 213	950m
Biological component	Distance from the Premises
Threatened / Priority Flora and Fauna	<p>The Application cites that the Nature Map database identified nine threatened and 30 priority flora species within 5km of the Premises.</p> <p>No threatened/ priority flora/fauna is expected to occur within the Premises boundary as the Premises is constructed on a hardstand.</p>

8.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 15.

Table 15: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Public Drinking Water Source Protection Area	4.5km	RIWI Act Perth Groundwater Area
Groundwater	<p>Groundwater depth 0.5-1.2 metre below ground level (The Application cites that the monitoring data was collected as part of the Hazelmere Enterprise Area Draft Structure Plan prepared by the City of Swan and Department of Planning in 2010).</p> <p>Groundwater flows in a north-westerly direction towards Helena River.</p> <p>Two monitoring bores are located near the south-east corner and north-west corner of the Premises however groundwater monitoring data is not available.</p>	RIWI Act Perth Groundwater Area and Shire of Swan South Subarea

8.5 Meteorology

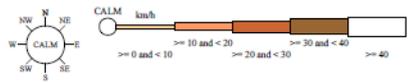
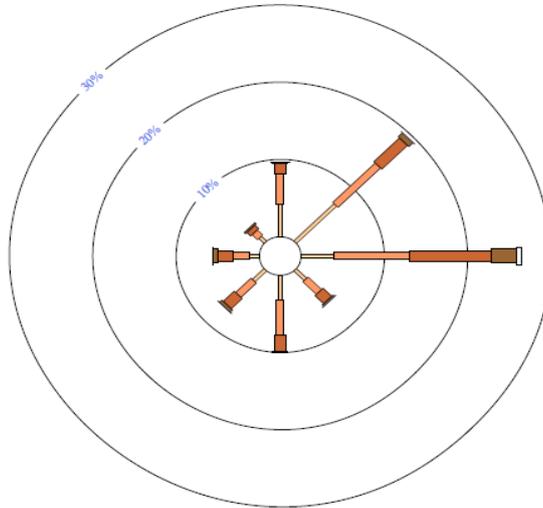
8.5.1 Wind direction and strength

Windrose profiles were generated to determine local wind patterns in the area. The windrose indicates that in the morning, most of the winds are from east, north-east. In the afternoon, most of the winds are from west, south-west.



9 am
26262 Total Observations

Calm 13%



3 pm
26246 Total Observations

Calm 4%

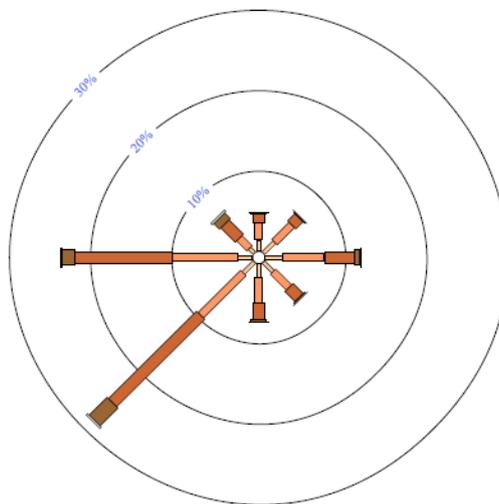


Figure 2: Annual windrose for the Perth Airport as generated from the Bureau of Meteorology website

It is important to note that these wind roses show historical wind speed and wind direction data for the Perth Airport weather station and should not be used to predict future data for the BGC-site.

9 Risk assessment

9.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Tables 16, 17 and 18.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 16, 17 and 18 below.

Table 16: Identification of emissions, pathway and receptors during *construction* (installation of proposed two transportable asphalt plants)

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts		
Noise & Dust	<p>Installation of transportable asphalt plants on site</p> <p>Installation of 4 bitumen tanks of 45kL each, one 30kL self-bunded diesel tank and one 55kL self-bunded diesel tank</p>	<p>Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary.</p> <p>Multiple commercial/ industrial receptors located within 500m of the Premises boundary.</p>	Air/ wind dispersion	Potential amenity impacts	No	<p>The Delegated Officer has determined that noise and dust emissions associated with installation (construction) of the two transportable plants and the new bitumen and diesel storage tanks on the Premises will not significantly alter the overall emissions from the Premises.</p> <p>Limited earthworks will be undertaken and construction period for the proposed asphalt plants will be less than 3 months.</p> <p>The EP (Noise) Regulations will apply to construction noise.</p>

Table 17: Identification of emissions, pathway and receptors during *commissioning* (proposed two transportable asphalt plants)

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts		
Noise	Commissioning of Almix TP88UF (250tph) plant and Astec Portable T-400 six pack (350tph) plant	Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary. Multiple commercial/ industrial receptors located within 500m of the Premises boundary.	Air/ wind dispersion	Potential amenity impacts	No	<p>Commissioning of the transportable asphalt plants will be undertaken over a short duration.</p> <p>The Delegated Officer has determined that noise emissions during commissioning can be managed under the EP (Noise) Regulations.</p> <p>The Delegated Officer has determined that point source emissions to air during commissioning are not likely to result in degradation of ambient air quality and exceed the goals set in the <i>National Environmental Protection (Ambient Air Quality) Measure (NEPM) 2003</i>.</p> <p>Contaminants in air emissions during commissioning will be similar to those during operation.</p> <p>The following regulatory controls will be included in the Licence for managing emissions and discharges during commissioning:</p> <ul style="list-style-type: none"> i. Specifying infrastructure and equipment requirements and requiring submission of construction compliance prior to undertaking commissioning ii. Specified actions for restricting commissioning duration and for submission of construction compliance iii. Stack monitoring requirements during commissioning iv. Requirement to submit emission verification report for validating performance during commissioning <p>Any unreasonable emissions during commissioning will be managed under the general provisions of the EP Act.</p>
Point source emissions to air (gases and particulates)						

Table 18: Identification of emissions, pathway and receptors during *operation* (includes consideration of existing activities and proposed transportable asphalt plants)

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)		
Emissions to Air	Fugitive Dust	<p>Asphalt manufacturing:</p> <ul style="list-style-type: none"> Raw material delivery Raw material stockpiles Material handling and transfer <p>Concrete batching and cement product manufacturing:</p> <ul style="list-style-type: none"> Raw material delivery Hopper and material feeding Storage of aggregate and sand <p>Raw material recycling system</p> <ul style="list-style-type: none"> Raw material delivery Hopper and material feeding Processed material stockpiles <p>Dust lift off from trafficable areas/ vehicle movement (from general activities on site) and cement dust</p>	<p>Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary.</p> <p>Multiple commercial/ industrial receptors located within 500m of the Premises boundary.</p>	Air/Wind dispersion	<p>Dust deposition on neighbouring residential / industrial Premises</p> <p>Potential amenity / health impacts</p>	<p>Yes</p> <p>Potential Impact to receptors</p>
	Fugitive dust- Cement and Lime	<p>Concrete batching and cement product manufacturing:</p> <ul style="list-style-type: none"> Storage of cement and lime (section 5.3.4) Raw material delivery <p>Raw material recycling system:</p> <p>Crushing and screening of fibre cement board production downgrades, paving and block concrete product manufacturing production downgrades, concrete production product, roof tile production downgrades</p>	<p>Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary.</p> <p>Multiple commercial/ industrial receptors located within 500m of the Premises boundary.</p>	Air/Wind dispersion	<p>Alkaline dust can cause respiratory impacts, irritation of eyes / skin</p> <p>Alkaline dust deposition can be corrosive</p>	<p>Yes</p> <p>Potential Impact to receptors</p>

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)		
	Fugitive dust containing asbestos	Raw material recycling (crushing and screening)			Potential health impacts – asbestos contaminated dust can cause respiratory impacts/ asbestosis	<p>No</p> <p>The Delegated Officer considers that the potential of asbestos contaminated raw material being crushed / screened on site is low because of the following:</p> <ul style="list-style-type: none"> • Material to be processed through crushing and screening plant will be restricted to malformed products or products which do not meet sale specification (eg: wrong size/ shade of colour etc) and will include roof tiles, concrete ready-mix and fibre cement board. • Material will be sourced only from within the Premises or from BGC's other manufacturing facilities in the Perth metropolitan area. • No Recycled Asphalt Pavement will be processed on site. • No construction or demolition waste will be processed on site. • Waste Acceptance Criteria will be specified in the Licence to restrict the types of materials processed through the raw material recycling plant.

Risk Events						Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)			
	Point source emissions – Particulates	Asphalt manufacturing Dryers, mixers Baghouse stack	Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary. Multiple commercial/ industrial receptors located within 500m of the Premises boundary.	Air/Wind dispersion	Potential health impacts Amenity (visible plume)	Yes	Potential impact to receptors
	Point source emissions- Gases (SOx, NOx, CO, PAH, VOCs)	Asphalt manufacturing Dryers Excessive heating of bitumen (blue smoke)			Potential health impacts		
	Odour	Normal operation: Asphalt manufacturing: <ul style="list-style-type: none"> • Use of out of specification bitumen binder • Additive or polymer modification • Fugitive emissions from mixing plant • Dryers Loadout/ transfer of hot mix asphalt: <ul style="list-style-type: none"> • Head space fumes from tanker truck or storage tanks released to atmosphere • Loaded trucks not adequately tarped • Loaded trucks delayed on site Bitumen storage Abnormal operation: <ul style="list-style-type: none"> • Loss of power to site • Failure of truck loading/ automatic covering system increasing truck loadout time • Baghouse failure • Overheating of bitumen 	Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary. Multiple commercial/ industrial receptors located within 500m of the Premises boundary.	Air/Wind dispersion	Amenity impacts		

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)		
Noise	Operating noise of machinery, vehicle movement within the Premises, loading/unloading of material outside of normal business hours	<p>Raw material recycling (Crushing and screening)</p> <p>Vehicle movement and loading (reverse beeper)</p> <p>Concrete batching and concrete products manufacturing</p>	<p>Closest residential Premises located 530m South of the Premises boundary. Multiple occupied residences located within 1 km of the Premises boundary.</p> <p>Multiple commercial/ industrial receptors located within 500m of the Premises boundary.</p>	Air/Wind dispersion	Amenity impacts	<p>Yes</p> <p>Potential impact to receptors.</p> <p>Separation distance from residential and industrial receptors not adequate to attenuate potential noise impacts.</p>
		Asphalt manufacturing (fixed plant and 2 transportable plants)				

Risk Events					Continue to detailed risk assessment	Reasoning
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)		
Emissions to land	<p>Spills</p> <p>Bulk storage of chemicals and fuel from the fuel farm and refueling area</p> <p>Bitumen spills</p>	Land	Direct discharge	<p>Soil contamination</p> <p>Stormwater contamination</p>	No	<p>Storage of diesel on the Premises is regulated under the <i>Dangerous Goods Safety Act 2004</i>. The Premises holds licence DGS0141123 to store and handle up to 165kL of diesel. The Applicant is also seeking approval under the DGS Act for additional storage of diesel on the Premises to complement operation of proposed transportable asphalt plants.</p> <p>The Delegated Officer has determined that regulatory controls under the DGS Act will be sufficient to manage potential emissions and discharges associated with hydrocarbon storage on the Premises.</p> <p>Bitumen solidifies readily and is not likely to cause stormwater contamination. Infrastructure requirements for storage will be specified on the Licence to minimise risk of soil contamination and odour emissions associated with major spills.</p>

Risk Events					Continue to detailed risk assessment	Reasoning	
Emission Type	Source/ Activities	Potential receptors	Potential pathway	Potential adverse impacts (cumulative)			
	Wastewater generation	Storage/ disposal of wastewater generated from concrete batching and cement product manufacturing activities including - Wash out of agitators, mixers or molds, cleaning up of spilt material	Groundwater – 0.5-1.2metres below ground level	Land/ infiltration Direct discharge/ infiltration	Groundwater contamination	Yes	Potential impact to receptors.
		Agitator truck wash at the recycle area (section 5.2.6 of the document)					
	Storage of site runoff in compensation basins						
	Excessive use of water sprays on aggregate stockpiles and operational area hardstand						
	Solid waste/ slurry	Material from slurry pits, wedge pits, settling ponds, silt traps and oil interceptors					

9.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 19 below.

Table 19: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 20 below.

Table 20: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk Treatment Matrix in Table 21 below:

Table 21: Risk Treatment

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

9.4 Risk Assessment – Odour Emissions from Normal Operation

9.4.1 Description of risk of odour emissions causing amenity impacts

Odour emissions during normal operations can arise from process stacks, bitumen storage tank vents, loading of bitumen tanks and mixers. Incomplete combustion of fuel in dryers can lead to emissions of volatile organic compounds (VOCs) and other organic particulate matter which may contribute to odour emissions. Significant odour emissions can also arise from truck loading of the asphalt product on the Premises. Given the small separation distance, there is potential for odour emissions to have adverse impacts on amenity or health of receptors.

9.4.2 Identification and general characterisation of emission

Odour emissions from asphalt plants can be attributed to emission of volatile organics which are associated with the use of bitumen, binders and admixes used in the process and fuel combustion. Non-combustion emissions from the dryer may include small amounts of VOCs, polycyclic aromatic hydrocarbons, NPI-listed aldehydes and listed hazardous organics from the volatile fraction of the bitumen. Site-specific emission factors for these contaminants have not been determined by the Applicant. The general emission factors specified in the *NPI Emission Estimation Technique Manual for Hot Mix Asphalt Manufacturing* are considered appropriate to determine potential emission rates of these contaminants from the Premises.

Loading of trucks by dumps of hot asphalt mix generates very large plumes with elevated odour intensity. Depending on the size of the truck, a full load may require several dumps of hot asphalt resulting in consecutive puffs of odorous emissions. The largest emission puff will occur when asphalt is dumped into the truck/ trailer from the hot mix silo.

The Applicant has indicated that operation of the proposed two transportable asphalt plants will result in increased truck movements on site. The *Odour Emissions Operations Review BGC Hazelmere Industrial Complex* authored by Stass Environmental dated November 2017 notes that approximately 90 truck loadout events may be expected each day during typical

operations (10 hours a day) at the Premises. The document also notes that load out can take 15-30 seconds for each truck. Once loaded, it takes 30 seconds to 1 minute for the truck to park at a location where the trailer will be covered with the tarpaulin prior to departing the site. The covering can take between 30- 60 seconds (considering manually and electrically operated mechanism). This indicates that the total loadout time for each truck will be approximately 1.5 and 2 minutes.

Given the frequency of truck load-outs proposed by the Applicant, it will mean approximately 9 trucks will be loaded each hour. It is noted that the number of truck loadouts may increase where the Premises undertakes night time operations outside of the typical operating duration. The Applicant has indicated that some of the trucks used on site will have automated systems to cover the load.

Taking into account the number of trucks to be loaded each hour and the total duration of truck load out including trailer covering, it can be expected that large volumes of odorous air will be emitted for approximately 15 to 20 minutes each hour. It will represent between 25% and almost 50% of the time each hour for 10 hours per day 6 days per week.

9.4.3 Description of potential adverse impact from the emission

Odour impacts depend on the frequency, intensity, duration, offensiveness of odour and location of the off-site receptors with respect to the odour generating activities. Odour emissions from the manufacturing process stacks, storage tank vents and fugitive emissions from dryers represent continuous emissions. Odour emissions associated with truck loading are transient (due to wind variability). However, it will represent a truck loaded every 6 minutes compared to an estimated 30min frequency based on the current throughput of 250,000t/yr. This higher frequency will significantly increase the likelihood of odour recognition and potentially the probability for complaining.

Odour emissions associated with asphalt production are typically classified as unpleasant, may be offensive to receptors and may impact amenity.

9.4.4 Criteria for assessment

There are no specific criteria to determine acceptability of odour emissions from a premises. General provisions of the EP Act, make it an offence to cause unreasonable emissions which may impact health, amenity or wellbeing of any person not on the Premises.

9.4.5 Licence Holder controls (from Application)

This assessment has reviewed the controls set out in the document titled *Odour Emissions Operations Review BGC Hazelmere Industrial Complex* authored by Stass Environmental dated November 2017, as summarised in Table 22 below.

Table 22: Licence Holder controls assessed to be relevant for management of odour emissions

Site operations	Summary of fugitive odour controls
Infrastructure	<p>Bitumen storage</p> <ul style="list-style-type: none"> • Bitumen delivery through sealed pipes that are trace heated and fully insulated. • Bitumen storage tanks are insulated and clad to minimise energy and vapour loss. <p>Mixing</p> <ul style="list-style-type: none"> • Baghouse installed will aid in removal of odorous particulates. Baghouse is fitted with a cold air damper to maintain inlet temperature below 160 °C and outlet below 100 °C. • Dryer temperature is maintained at 170°C. Burner and aggregate feed are halted if dryer temperature exceeds 200 °C. This prevents overheating of aggregates and bitumen and associated VOC / odour emissions. • Baghouse differential pressure is maintained between 670-850 Pa (2.7-3.4 Water Column). Operation outside this range indicates that baghouse may be operating below its optimum specification. Either the particle layer on the baghouse starts being too thick or the baghouse has cracked with a potential increase in particulate matter emissions and associated odorous compounds. • Over temperature alarms will be set for main burners on asphalt plants and oil burners on bitumen tanks. <p>Load out</p> <ul style="list-style-type: none"> • Each asphalt plant will have integrated hot storage bins. Enclosed slat conveyers are used to move hot asphalt into hot storage bins for the 2 proposed transportable plants. An enclosed shuttle buggy moves each batch of hot mix into hot storage bins at existing fixed plant. • Truck sprays such as Kleenslip, Enviroslip or Truckslip are used instead of diesel (odorous) to prevent asphalt from adhering to the truck. • After loading each truck will be immediately tarped. <p>Contols</p> <ul style="list-style-type: none"> • Third party community and nearby commercial and industrial activities engagement shall be implemented within a month of the date of grant of the licence. • The load out stations are fitted with either curtains or cladding on either side with additional flared skirting to stop wind cross flow and aid in airflow retention. <p>Contingency measures</p> <ul style="list-style-type: none"> • An air extraction system may be installed at loading bay under the curtains or cladding to extract and direct fumes to other parts of the asphalt manufacturing process. • Loading operations will be limited to some specific wind sectors not conducive to possible impacts at sensitive receptors. • Bitumen tanks will be fitted with carbon activated filters. • A full enclosure of the loading zone with fumes extraction may be required should none of above contingency measures is efficient. • Third party community engagement will be commenced if issues are seen to be significant.

Management	<ul style="list-style-type: none">• A contact telephone number will be displayed on the front gate of the facility to enable members of the public to report any offensive odour incident 24/7;• Any complaints will be immediately reported to batch operator / operations manager who will inform the Environmental Manager for further investigation.• Operations or processes identified as the source / cause of odour nuisance will be shut down until the issue is rectified.• When atmospheric conditions are considered to be not conducive to loading (such as inversion conditions), the BGC Environmental Manager will be contacted by the operator for management decision on loading. (It should be noted that dusk and dawn periods are more conducive to increased odour impacts in frequency, duration and intensity).
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9.4.6 Key findings

The Delegated Officer has reviewed the information regarding the risk of odour emissions and has found:

1. Applicant infrastructure controls and management actions are documented in the *Odour Emissions Operations Review (Review), November 2017*. The Review does not:
 - a. identify the truck load out operation as a high risk source of odour;
 - b. use the FIDOL concept appropriately;
 - c. provide any robust list of controls, triggers, corrective actions, effectiveness evaluation and contingency actions for some of the identified sources and especially for the truck load out operation.
2. Considering local wind patterns and separation distance from the Premises, there is potential for odour emissions to impact residential and commercial receptors, particularly during dawn and dusk.
3. Odour emissions from truck loading are likely to be significant.
4. The Applicant currently does not have a meteorological station on the Premises. This may impede the Applicant's ability to take precautionary measures to prevent potential odour complaints or to investigate root cause when complaints are received.
5. DWER experience has shown slight differences in the wind regimes between the location of the Premises and that of the Perth airport data which was used in the assessment.
6. The Applicant has committed to infrastructure upgrades as a contingency measure for control / mitigation of odour emissions if verified complaints are received.

9.4.7 Consequence

The Delegated Officer has determined that there is potential for offsite impacts at local scale, mid-level impacts to amenity. Therefore, the Delegated Officer considers the consequence of odour emissions from normal operations impacting the receptors to be **Major**.

9.4.8 Likelihood of Risk Event

Given the applicant controls and management measures proposed, separation distance from sensitive receptors, history of activities on site and experience with similar operations, the Delegated Officer has determined that it is likely that impact from odour emissions will probably occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of Odour emissions from normal operations impacting the receptors to be **Likely**.

9.4.9 Overall rating of risk of odour emissions impacting amenity of receptors

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of odour emissions impacting health or amenity of receptors is **High**.

9.5 Risk Assessment – Odour Emissions from Abnormal Operations

Abnormal operations represent scenarios such as failure of abatement baghouse, technical issues with truck loading including trailer covering. No specific controls have been proposed to manage odour emissions during abnormal operations. Scenarios where operating

temperatures exceed the optimum range have been assessed under normal operations.

9.5.1 Consequence

The Delegated Officer has determined that there is potential for offsite impacts at local scale, mid-level impacts to amenity. Therefore, the Delegated Officer considers the consequence of odour emissions from abnormal operations impacting the receptors to be **Major**.

9.5.2 Likelihood of Risk Event

Considering the applicant controls and management measures proposed, separation distance from sensitive receptors, history of activities on site and experience with similar operations, the Delegated Officer has determined that it is likely that impact of odour emissions could occur at some time. Therefore, the Delegated Officer considers the likelihood of Odour emissions from abnormal operations impacting the receptors to be **Possible**.

9.5.3 Overall rating of risk of odour emissions impacting amenity of receptors

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of odour emissions impacting health or amenity of receptors is **High**.

9.6 Risk Assessment – Fugitive Dust Emissions from Normal and Abnormal Operation

9.6.1 Description of risk of fugitive dust emissions causing health or amenity impacts

Normal operation

Fugitive dust emissions can arise from operations at the Premises. Given the small separation distance from receptors, there is potential for uncontrolled fugitive dust emissions to have adverse impacts on amenity or health of receptors.

Key dust generating activities on the Premises include:

- **Asphalt manufacturing:**
 - Raw material delivery;
 - Raw material stockpiles;
 - Material handling and transfer (conveyors).
- **Concrete batching and cement product manufacturing:**
 - Raw material delivery;
 - Raw material stockpiles;
 - Hopper and material feeding.
- **Raw material recycling system;**
 - Raw material delivery;
 - Raw material stockpiles;
 - Hopper and material feeding;
 - Crushing and screening;
 - Processed material stockpiling
- **Dust lift off from trafficable areas / vehicle movement** (from general activities on

site).

Abnormal operation

Fugitive dust emissions can arise from concrete batching and the paving and block manufacturing operations on site when dust collector / filtration systems used for cement storage silos, agitator trucks fail or malfunction. Abnormal operations also include scenarios where water sprays / sprinklers used for controlling fugitive dust from stockpiles fail or malfunction.

9.6.2 Identification and general characterisation of emission

Fugitive dust emissions from operations will mainly comprise of particulate matter (PM₁₀). Fugitive particulate matter emissions from storage stockpiles can occur during raw material deliveries / unloading, operation of front end loaders and during strong wind periods. Moisture content of aggregates being processed on site can also impact on the amount of fugitive dust generated. Fugitive dust from stockpiles of mineral aggregates can be generally expected to be inert however there is potential for silica dust emissions to occur if certain types of mineral aggregates are used.

The Applicant has not indicated an intention to use artificial aggregates or by-products from other industries (slag, fly-ash, waste oil etc) in the asphalt manufacturing process. Based on this it is considered that fugitive dust emissions from the Premises are not likely to contain significant concentrations of heavy metals or other chemicals.

Concrete batching operations can lead to emissions of cement or lime dust from the Premises. The Premises operates a crushing and screening plant to recycle off-specification products from the paving and block manufacturing operations on the Premises. The crushing and screening plant is also used to process off-specification products from BGC's other operations in the metropolitan area and waste / unused concrete batching material generated within the Premises. There is potential for fugitive dust emissions from crushing and screening plant to contain cement or lime dust. The Applicant has confirmed that no construction or demolition waste is processed on site. Accordingly, asbestos contamination in fugitive dust is not considered likely.

9.6.3 Description of potential adverse impact from the emission

Fugitive dust emissions can have nuisance or amenity impacts and can result in degradation of local air quality. Cement or lime dust can cause respiratory impacts, irritation of eyes / skin. There are multiple industrial and residential receptors located in proximity of the Premises. Nearest residential receptor is located 530m from the Premises boundary.

9.6.4 Criteria for assessment

Ambient air quality goals set in the National Environmental Protection (Ambient Air Quality) Measure (NEPM) 2003 recommends that PM₁₀ concentration should not exceed 50µg/m³ over a 24-hour averaging period.

The Premises is in an area zoned 'industrial development' under the City of Swan Local Planning Scheme No. 17 and has other industry in vicinity which can contribute to ambient dust levels in the airshed. Ambient dust monitoring at receptors has not been undertaken.

Requirements specified in the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* set assessment criteria for the concrete batching and the block and paver manufacturing operations onsite.

9.6.5 Licence Holder controls (from Application)

This assessment has reviewed the controls set out in the document titled *BGC Dust Management Plan, BGC Hazelmere WA, October 2017* as summarised in Table 23 below.

Table 23: Licence Holder's proposed controls for management of fugitive dust emissions as documented in *BGC Dust Management Plan, October 2017*

Site operations	Summary of fugitive dust controls
Materials movement- aggregate and sand tippers	<ul style="list-style-type: none"> • Trucks have covers up until point of unloading • Materials to be unloaded into three walled material bays • Reasonable care will be taken to schedule the unloading of materials so the volume does not exceed material bay dimensions • Water cart and mechanical sweeper is used on site
Materials movement- cement and lime pneumatic tankers	<ul style="list-style-type: none"> • Pneumatically controlled pump will be used to transfer materials from tanker to silo via airstide under slightly negative pressure • High / low level alarms will be used to prevent overfilling • Silo top filters are used • Spare filter cartridges are held on site • Overflow pressure relief valves
Materials movement- paver and block trucks	<ul style="list-style-type: none"> • Materials being loaded onto trucks are predominantly cured concrete products and solid by nature • Materials are loaded on pallets • Water cart and sweeper is used on site
Materials processing- conveyors	<p>Most conveyors are covered. Currently uncovered conveyors at block manufacturing operations will be fitted with covers</p>
Materials processing- crushing and screening	<ul style="list-style-type: none"> • Water sprays are activated during operation • Conveyors typically operated in the morning before sea breeze takes hold
Vehicle movement on site	<ul style="list-style-type: none"> • Water cart and mechanical sweeper is used on site • Drive speeds are limited to 20km/hour
Vehicles moving out from the Premises	<ul style="list-style-type: none"> • All vehicles carting loose material are covered • Trucks carrying concrete products are swept and maintained
Stockpiles	<ul style="list-style-type: none"> • Materials to be stored in three walled material bays to mitigate wind erosion • Ongoing rollout of roofs on material bays that store the same product permanently (eg: sized aggregate) • Roofs to be placed on material bays of fine materials (eg: granite fines/ dust) • Material bay dimensions to be designed to accept typical operations volumes and throughput • Reasonable care to be taken to schedule the unloading of materials so the volume does not exceed material bay dimensions • In the event an unloaded volume is likely to exceed material bay dimensions, it will be extended out from the wall rather than above it • Sprinkler reticulation to material bays automated during summer windy

Site operations	Summary of fugitive dust controls
	<p>periods and manual override as needed</p> <ul style="list-style-type: none"> • Water carts and sweeper on site
Silos	<ul style="list-style-type: none"> • Silos used for storing processed cement and lime are enclosed at all times • Pneumatically controlled pumped from tanker to silo via airslide under slightly negative pressure to ensure sealed transfer • Reverse pulse cleaning systems • Silo top filters replaced periodically as per maintenance schedule • High/Low level alarms used to prevent overfilling • Overflow pressure relief valves used • Spare filter cartridges held on site • Operator training on tanker transfer • During filling of cement silos, displaced air is passed through a baghouse (Dustcotech filters used in concrete batching operations, Goyen filters used in block making and paving manufacturing operations). Dust generated from agitator charging is recycled back into the silos via a hooded vacuum
Dust collectors	<ul style="list-style-type: none"> • Reverse pulse cleaning systems are used in the cement and lime silos, differential pressure monitoring system is used to detect potential leaks/ failure in the baghouse installed on fixed asphalt plant • Operations Managers have the responsibility to ensure that dust collectors are operating at optimum level daily. Should an issue be identified, all operations shall cease in the affected area until the appropriate maintenance has been undertaken and approved by the Operations Manager. No formal log will be maintained unless an issue is identified
Visual monitoring	<ul style="list-style-type: none"> • All operations personnel will report any major dust emission observations to the relevant Operations Manager who will be responsible for cessation of operation
Weather monitoring	<ul style="list-style-type: none"> • The Bureau of Meteorology forecast will be reviewed weekly to determine any strong wind periods forecast. This process will not be logged • A wind sock will be erected at Lot 76 as a visual cue

9.6.6 Key findings

The Delegated Officer has reviewed the information regarding the risk of fugitive dust emissions and has found:

1. Fugitive dust emissions are likely from Premises operations. Concrete batching and crushing / screening activities on site can release alkaline cement / lime dust. Industrial and residential receptors are located less than 500m from the Premises boundary.
2. Applicant infrastructure controls and management actions are documented in the *BGC Dust Management Plan (DMP), October 2017*. The DMP does not:
 - i. satisfactorily demonstrate how the Applicant will internally monitor or verify compliance with the commitments given in the DMP;
 - ii. include a procedure for review of effectiveness of any corrective

- actions taken or proposal for regular inspections or audits;
 - iii. include record keeping procedures for routine checks or maintenance for control measures proposed by the Applicant;
 - iv. define what criteria will be used to determine whether a potential dust event is classed major or minor; where the DMP proposes cessation of an activity following a major dust event.
3. The Premises operations are also subject to regulatory requirements stipulated under the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998*.

9.6.7 Consequence- Normal operation

The Delegated Officer has determined that there is potential for offsite impacts at a local scale, and impacts to amenity. Therefore, the Delegated Officer considers the consequence of fugitive dust emissions from operations impacting the receptors to be **Moderate**.

9.6.8 Likelihood of Risk Event- Normal operation

Given the applicant controls and management measures proposed, separation distance from sensitive receptors, history of activities on site and experience with similar operations, the Delegated Officer has determined that the likelihood of the impact of fugitive dust emissions could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Possible**.

9.6.9 Overall rating of risk of fugitive dust emissions impacting health or amenity of receptors- Normal operation

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of fugitive dust emissions impacting health or amenity of receptors is **Medium**.

9.6.10 Consequence- Abnormal operation

The Delegated Officer has determined that there is potential for low level offsite impacts at local scale and mid-level impacts to amenity. Therefore, the Delegated Officer considers the consequence of *fugitive dust emissions from abnormal operations impacting the receptors* to be **Moderate**.

9.6.11 Likelihood of Risk Event- Abnormal operation

Given the applicant controls and management measures proposed, separation distance from sensitive receptors, history of activities on site and experience with similar operations, the Delegated Officer has determined that the impact of fugitive dust emissions during abnormal operations could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Possible**.

9.6.12 Overall rating of risk of fugitive dust emissions impacting health or amenity of receptors- Abnormal operation

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of fugitive dust emissions impacting health or amenity of receptors is **Medium**.

9.7 Risk Assessment – Point Source Emissions to Air (particulates) - Normal and Abnormal Operations

9.7.1 Description of risk of point source particulate emissions causing health or amenity impacts

Normal operations

Particulate emissions emitted to air from process stacks associated with use of sand and aggregates in the asphalt manufacturing process. Rotary aggregate heater/ dryer used in asphalt manufacturing is a major source of particulate matter emissions. Given the small separation distance from receptors, there is potential for uncontrolled particulate dust emissions to have adverse impacts on amenity or health of receptors.

Abnormal operations

Particulate emissions to air from asphalt manufacturing process stacks following failure of baghouse. Particulate emissions to air from concrete batching operations (cement storage silos) following failure of air cleaning / filtration system.

9.7.2 Identification and general characterisation of emission

Particulate emissions associated with use of sand and aggregate in the asphalt production and incomplete combustion of fuel. Cement or lime dust from concrete batching can cause respiratory impacts, irritation of eyes / skin.

9.7.3 Description of potential adverse impact from the emission

Particulate matter has the potential to impact public health and amenity and may affect respiratory and cardiovascular systems following both long and short-term exposure. Health impacts of particulate matter are influenced by chemical composition of particulates, mass concentration and duration of exposure.

9.7.4 Criteria for assessment

The Premises is in an area zoned 'industrial development' under the City of Swan Local Planning Scheme No. 17 and has other industry in vicinity which can contribute to ambient dust levels in the airshed. Ambient dust monitoring at receptors has not been undertaken. Ambient air quality goals set in the National Environmental Protection (Ambient Air Quality) Measure (NEPM) 2003 recommends that PM₁₀ concentration should not exceed 50µg/m³ over a 24-hour averaging period.

Requirements specified in the *Environmental Protection (Concrete Batching and Cement Product manufacturing) Regulations 1998* set assessment criteria for the concrete batching and the block and paver manufacturing operations onsite.

9.7.5 Licence Holder controls (from Application)

This assessment has reviewed the controls set out in Table 24 below.

Table 24: Licence Holder’s proposed controls for management of stack particulate emissions

Control	Description
Infrastructure	<ul style="list-style-type: none"> The fixed asphalt plant currently operating on the Premises uses a baghouse for particulate dust control. The proposed two transportable asphalt plants will use baghouse technology as well. All baghouses installed are designed to achieve particulate matter concentration of less than 50mg/m³ in exhaust gas. Differential pressure between the upper and lower parts of the baghouse is monitored. Bag pulsing is used for bag cleaning and to restore bags to 96% of installed efficiency. Internal temperature of baghouse is maintained within the range 110 to 180°C with a short-time limit exceedance to 205 °C allowed. Operating temperatures are maintained by an over-temperature stop device that controls a cold-fan valve on the gas inlet to the baghouse. In case of a temperature-exceedance, the control system will cut the fuel supply to the burner.
Management	<ul style="list-style-type: none"> Baghouse maintained on scheduled basis and serviced regularly. Differential pressure is monitored to ensure optimal performance of baghouse. Spare bags are stocked on site.

9.7.6 Key findings

The Delegated Officer has reviewed the information regarding risk of point source particulate emissions and has found:

1. Uncontrolled particulate matter emissions from process stacks have the potential to impact receptor amenity.
2. The Licence Holder has differential pressure monitors to manage performance of baghouse. The baghouse does not have multiple compartments or the ability to take the faulty bag offline and continue operations. As a result, failure of a bag is likely to affect performance of the baghouse until the defect is rectified.

9.7.7 Consequence- Normal Operations

Considering the infrastructure controls used during normal operations, the Delegated Officer has determined that point source particulate emissions to air will cause minimal amenity impacts offsite. Therefore, the Delegated Officer considers the consequence of point source particulate emissions to air impacting receptors to be **Minor**.

9.7.8 Likelihood of consequence- Normal Operations

Asphalt manufacturing is undertaken on the Premises daily. Installation of the proposed two transportable asphalt plants will increase the asphalt production capacity at the Premises.

The Delegated Officer has determined that minor impact associated with stack particulate emissions during normal operations will probably occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of stack particulate emissions during normal operations impacting the receptors to be **Likely**.

9.7.9 Consequence- Abnormal operation

The Delegated Officer has determined that there is potential for low level offsite impacts at local scale and mid-level impacts to amenity. Therefore, the Delegated Officer considers the consequence of point source particulate emissions from operations impacting the receptors to be **Moderate**.

9.7.10 Likelihood of Risk Event- Abnormal operation

Given the applicant controls and management measures proposed, separation distance from sensitive receptors, history of activities on site and experience with similar operations, the Delegated Officer has determined that the impact of point source particulate emissions during abnormal operations will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Unlikely**.

9.7.11 Overall rating of risk of point source particulate emissions to air impacting health or amenity of receptors- Normal Operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of point source particulate emissions to air impacting receptors is **Medium**.

9.8 Risk Assessment- Point Source Emissions to Air (Gases)

9.8.1 Description of risk of point source gaseous emissions causing health or amenity impacts

Normal operations

Point source gaseous emissions from asphalt manufacturing are mainly associated with fuel combustion, heating and mixing of aggregate and bitumen. Overheating of bitumen can lead to blue smoke emissions.

9.8.2 Identification and general characterisation of emission

Point source gaseous emissions from combustion depend on fuel type and combustion efficiency. Given the use of diesel in the proposed transportable asphalt plants, key gaseous emissions will include volatile organic compounds (VOCs - e.g. Benzene, Toluene, Ethylene and Xylene – referred to as BTEX) and combustion gases nitrogen oxides (NO_x), sulfur dioxide (SO₂) and carbon monoxide (CO).

Existing fixed asphalt plant on the Premises uses natural gas as fuel. Key emissions from the fixed plant include nitrogen oxides, carbon monoxide and VOCs.

9.8.3 Description of potential adverse impact from the emission

Short term exposure to elevated concentrations of nitrogen oxides and sulfur dioxide may cause respiratory impacts. High concentrations of carbon monoxide may affect the amount of oxygen carried in the bloodstream and lead to associated health impacts. The nature and hazards of emissions of VOCs are wide ranging as the term encapsulates aggregate VOCs some of which have low toxicity while others such as, BTEX, can pose chronic health risks. The nature and extent of impacts depend on duration of exposure and concentrations.

9.8.4 Criteria for assessment

Ambient air quality goals set in the National Environmental Protection (Ambient Air Quality) Measure (NEPM), as amended on 4 February 2016 are considered appropriate. Air emissions modelling has not been undertaken by the Licence Holder. No specific criteria have been applied to determine suitability of point source gaseous emissions.

Table 25: Assessment criteria - gaseous emissions

Parameter	Ambient criteria	Averaging period	Guideline
CO	9ppm	8-hour	NEPM, as amended on 4 February 2016
NOx	0.12ppm	1-hour	
	0.03ppm	Annual	
SO ₂	0.2ppm	1-hour	
	0.08ppm	24-hour	
	0.02ppm	Annual	
PM10	50µg/m ³	24-hour	
	25 µg/m ³	Annual	
PM2.5	25 µg/m ³	24-hour	
	8 µg/m ³	Annual	

9.8.5 Licence Holder controls (from Application)

This assessment has reviewed the controls set out in Table 26 below.

Table 26: Licence Holder's proposed controls for management of gaseous emissions

Control	Description
Infrastructure	<ul style="list-style-type: none"> Stack height will be 6 metres above ground for the transportable asphalt plants. The fixed plant has a 12 meter above-ground stack. Burners complying with Australian Standards AS1375 for Industrial Fuel-Fired Appliances will be fitted on the transportable plants. Control systems can cut off fuel supply to the burner in case of emergency or where temperatures exceed the optimum range specified by manufacturer.
Management	<ul style="list-style-type: none"> Digital control of burner function, temperature monitoring and fuel / air mixture ratio management. Preventing overheating of bitumen.

9.8.6 Key findings

The Delegated Officer has reviewed the information regarding risk of point source gaseous emissions and has found:

1. Point source gaseous emissions from process stacks have the potential to degrade ambient air quality. Gaseous emissions mainly include combustion gases and their concentration will depend on process efficiency and the type of fuel used.
2. Reported stack emissions for the proposed asphalt plants appear significant. The Applicant's claim that modifying burners on the transportable asphalt plants will result in significantly lower emission rates than those predicted remains to be verified. Regulatory controls will be required to manage stack emissions from proposed asphalt plants.
3. The Applicant has committed to undertake stack monitoring to verify predicted emission rates from the proposed asphalt plants. Air emissions modelling has not been undertaken however considering the general profile of industry in the surrounding area, point source gaseous emissions from normal operations are not likely to cause exceedance of ambient air quality standards (NEPM, 2016).

9.8.7 Consequence

Considering the infrastructure controls and management measures used during normal operations, the Delegated Officer has determined that point source gaseous emissions to air will cause minimal amenity impacts offsite and onsite. Therefore, the Delegated Officer considers the consequence of point source gaseous emissions to air impacting receptors to be **Minor**.

9.8.8 Likelihood of consequence

Asphalt manufacturing is undertaken on the Premises daily. Installation of the proposed two transportable asphalt plants will increase the asphalt production capacity at the Premises. Considering the local wind profile and distance from receptors, the Delegated Officer has determined that minor impact associated with point source gaseous emissions during normal operations will probably occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of point source gaseous emissions during normal operations impacting the receptors to be **Likely**.

9.8.9 Overall rating of risk of point source particulate emissions to air impacting health or amenity of receptors- Normal Operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of point source gaseous emissions to air impacting receptors is **Medium**.

9.9 Risk Assessment - Noise Emissions

9.9.1 Description of risk of noise emissions causing health or amenity impacts

Noise emissions can arise from normal operations due to:

- Onsite aggregate movement and loading;
- Onsite generator operations (proposed to be used for temporary asphalt plants);
- Onsite asphalt plant drums, ventilation fans, burner blowers and screens;

- Onsite vehicle movement (loaders, trucks, road sweepers);
- Operation of crushing and screening plant; and
- Block manufacturing operations (Finlay block maker machine)

Asphalt production and replenishment of material stockpiles may be undertaken on the Premises during night time to meet project demand. Given the small separation distance from receptors, there is potential for noise emissions to have adverse impacts on amenity or health of receptors.

9.9.2 Description of potential adverse impact from the emission

Noise emissions may impact amenity of receptors. Regular exposure to consistent elevated noise levels may cause health impacts such as hearing impairment, irritability, hypertension.

9.9.3 Criteria for assessment

The assigned noise level specified in the EP (Noise) Regulations is the relevant criteria for assessment.

9.9.4 Licence Holder controls

This assessment has reviewed the controls set out in Table 27 below.

Table 27: Licence Holder's proposed controls for management of noise emissions

Control	Description
Infrastructure	<ul style="list-style-type: none"> • Regular maintenance of equipment. • Commitment to install or retrofit acoustic mufflers or silencing devices on equipment.
Management	<ul style="list-style-type: none"> • Checking weather (wind and meteorological) forecasts. • Undertaking work during hours that least adversely affect sensitive receptors. Standard working hours are Monday to Saturday 07:00 to 17:00¹ • Noise blankets on walls of Finlay machine² • Loading materials into crusher at lowest possible height. • Limiting vehicle speed below 20km/hour. • Investigating any complaints received. • Proposed construction works will be undertaken between 7am and 7pm on days other than Sundays and public holidays in compliance with the EP (Noise) Regulations.

Note: 1 The Applicant has noted that proposed temporary asphalt plants may operate outside of these normal operating hours depending on project demand.

Note 2: DWER site visit in September 2017 observed that one Finlay machine (egg layer) being used on the Premises did not have the noise blanket.

9.9.5 Key findings

The Delegated Officer has reviewed the information regarding noise emissions and has found:

1. Predicted noise emission levels during operation of the proposed two asphalt plants will comply with the EP (Noise) Regulations during day and night time and will not significantly contribute to increase in noise emissions levels at receptors.
2. Infrastructure and management controls proposed by the Applicant are appropriate.

9.9.6 Consequence

Considering the infrastructure controls and management measures used during normal operations, the Delegated Officer has determined that noise will cause minimal amenity impacts offsite. Therefore, the Delegated Officer considers the consequence of noise emissions to impact receptors to be **Minor**.

9.9.7 Likelihood of consequence

Asphalt manufacturing is undertaken on the Premises on a daily basis. Installation and operation of the proposed two transportable asphalt plants will significantly increase the asphalt production capacity at the Premises. Considering the distance from receptors, the Delegated Officer has determined that there will be a minor impact associated with noise emissions during normal operations which will probably occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of noise emissions during normal operations impacting the receptors to be **Likely**.

9.9.8 Overall rating of risk of point source particulate emissions to air impacting health or amenity of receptors - Normal Operations

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of noise emissions to impacting receptors is **Medium**.

9.10 Risk Assessment - Emissions to land

9.10.1 Description of risk of emissions to land impacting groundwater quality

Emission of hydrocarbons (associated with spills of fuel, bitumen), contaminated stormwater runoff stored in compensation basins and wastewater from truck wash discharged to infiltration basins onsite can potentially contaminate the soil and degrade groundwater quality.

The Premises has three unlined compensation basins to contain stormwater runoff. Two located in the northern portion of Lot 4 and one located in the north-west corner of Lot 76. An infiltration basin is located in the south west corner of Lot 4, adjacent to the road transport truck wash bay. Soak wells are located on Lot 202 which receive wastewater from the Clearmake industrial oil-water coalescing plate separator.

9.10.2 Identification and general characterisation of emission

Spills of fuel and bitumen can lead to contamination of soil with hydrocarbons and indirectly impact groundwater quality. Surface water runoff from the Premises is likely to be contaminated with hydrocarbons, sediments. DWER site visit in September 2017 observed that acids were stored on site for use in truck washing. Discharging this water to unlined basins or infiltration basin on the Premises can potentially impact groundwater quality.

9.10.3 Description of potential adverse impact from the emission

Groundwater in the area is shallow at a depth of 0.5-1.2 metres below ground level. The Premises is located in the RIWI Act Perth Groundwater Area and Shire of Swan South Subarea. Local groundwater flows in a north-westerly direction towards Helena River. There is potential for spills or leaks of fuels, admixtures and acids used on the Premises. Storage of contaminated wastewater runoff in unlined containment basins and discharge via infiltration basin could lead to contamination of groundwater with hydrocarbons and lower the pH of groundwater.

9.10.4 Criteria for assessment

General provisions of the EP Act make it an offence to cause or allow pollution. Additionally, it is an offence to discharge petrol, diesel or other hydrocarbons into the environment under regulation 3 of the EP Unauthorised Discharges Regulations.

The *Water Quality Protection Note 68 Mechanical equipment wash down, September 2013* recommends that the quality of treated waters discharged to soakage should be compatible with all the existing environmental values of the downstream water resources within 1km of the disposal point and as an indicative guide, discharged water should meet the criteria specified in Table 28 below.

Table 28: Indicative wastewater discharge criteria

Measured component	Limiting criteria
pH	Within the range 5.5 to 8.5
Salinity (measured as electrical conductivity)	1800µs/cm (maximum)
Surfactants (detergents)	5mg/L (maximum)
Total petroleum hydrocarbons	15mg/L (maximum)
BTEX	10µg/L (cumulative maximum)
Other toxic soluble contaminants	Ten times the guideline criteria or investigation trigger for local water values as published in the relevant national Water Quality Management Strategy Guideline criteria to protect local water resource values.

Requirements specified in the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* set assessment criteria for the concrete batching and the block and paving manufacturing operations onsite relating to the treatment and management of wastewater.

9.10.5 Licence Holder controls (from Application)

This assessment has reviewed the controls set out in Table 29 below.

Table 29: Applicant's/Licence Holder's proposed controls for leaks or spills of hazardous liquids

Control	Description
Infrastructure – <i>hydrocarbon chemical storage</i>	<ul style="list-style-type: none"> The existing three horizontal single walled diesel tanks (55kL each) are located inside a double brick walled bund with estimated storage capacity of 194.4m³. These tanks have isolation valves. The Premises holds Dangerous Goods Licence DGS0141123 to store and handle up to 165kL of diesel fuel. Additional diesel storage for the proposed transportable asphalt plants will be undertaken in self-bunded tanks. Storage will be undertaken on a hardstand.
Infrastructure-wastewater	<ul style="list-style-type: none"> Three wedge pits are used to intercept stormwater flow to the northern compensation basins on Lot 4 and to capture silts and suspended solids. Clearmake industrial oil-water coalescing plate separator is used to treat wastewater collected from the lined sump which captures runoff from truck and plant wash on the boundary of Lot 76 and Lot 202
Management	<ul style="list-style-type: none"> Spill kits will be maintained for any minor spills and drips during refuelling. Stockpiles of sand and gypsum will be used to manage larger spills. Hydrocarbon contaminated material will be disposed offsite. Any bitumen spills during storage tank refilling will be retrieved and recycled into the operation. Quality of water discharged is tested every six months and compared against Indicative Waste Discharge Criteria, specified in the then Department of Water's <i>Water Quality Protection Note 68, Mechanical equipment wash down</i>, dated September 2013.

9.10.6 Key findings

The Delegated Officer has reviewed the information regarding the risk of discharge to land impacting groundwater quality and has found:

1. Surface water runoff from the site can be contaminated with hydrocarbons and other chemicals. Wastewater runoff from truck washing can be contaminated with hydrocarbons and other cleaning chemicals, such as acids, used for truck washing.
2. Groundwater at the Premises is at a depth of 0.5-1.2 metres below ground level. This is lower than the vertical separation distance recommended in the Water Quality Protection Note 68.
3. Soak wells located on Lot 202 receive wastewater from the Clearmake industrial oil-water coalescing plate separator. The wastewater quality monitoring results for 23 May 2017 submitted by the Licence Holder indicate that TPH concentration and pH meet the indicative criteria recommended in the Water Quality Protection Note 68.

An infiltration basin is in the south west corner of Lot 4 adjacent to truck wash bay. Wastewater reporting to this infiltration basin does not undergo chemical treatment prior to discharge.

4. There is potential that activities on site may impact groundwater quality.

9.10.7 Consequence

Considering the infrastructure controls and management measures used during normal operations, location of the Premises, scale of operations and nature of other industries in the surrounding area the Delegated Officer has determined that discharge to land may cause minimal offsite impact. Therefore, the Delegated Officer considers the consequence of discharge to land impacting groundwater quality to be **minor**.

9.10.8 Likelihood of Risk Event

Truck washing and discharge to compensation basins and soak wells occurs on a regular basis during normal operations. Considering the shallow groundwater depth at the Premises, the Delegated Officer has determined that minor impact associated with discharge to land will probably occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of consequence to be **likely**.

9.10.9 Overall rating of risk of discharge to land impacting groundwater quality

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 19) and determined that the overall rating for the risk of discharge to land impacting groundwater quality is **medium**.

9.11 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 30 below. Controls are described further in section 10.

Table 30: Risk assessment summary - operation

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	Source	Pathway/ Receptor (Impact)			
1.	Odour emissions from normal operations	See Table 18	Air/wind dispersion	See section 10.4	High	Acceptable subject to Licence Holder controls conditioned and multiple regulatory controls
2.	Odour emissions from Abnormal operations			See section 10.5	High	Acceptable subject to Licence Holder controls conditioned and multiple regulatory controls
3.	Fugitive dust emissions-normal and abnormal operations			See section 10.6	Medium	Acceptable subject to Licence Holder controls and regulatory controls
4.	Point source emissions to air (particulates)- Normal and Abnormal operations			See section 10.7	Medium	Acceptable subject to Licence Holder controls and regulatory controls
5.	Point source emissions to air (gases)			See section 10.8	Medium	Acceptable subject to Licence Holder controls and regulatory controls
6.	Noise emissions			See section 10.9	Medium	Acceptable subject to Licence Holder controls and regulatory controls specified in the EP (Noise) Regulations
7.	Emissions to land		Direct discharge/ infiltration	See section 10.10	Medium	Acceptable subject to Licence Holder controls and regulatory controls

10 Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Tables 31 and 32. The risks are set out in the assessment in section 9 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Licence will be set to give effect to the determined regulatory controls.

Table 31: Summary of regulatory controls to be applied during construction and commissioning of works authorised by this Licence

		Controls (references are to sections below, setting out details of controls)			
		10.1.1 Infrastructure and equipment	10.1.4 Specified action	10.1.5 Monitoring	10.1.6 Reports
Risk Items (see risk analysis in Table 16 & 17)	Point source emissions (particulates) during commissioning	●	●	●	●
	Point source emissions (gases) During commissioning	●	●	●	●
	Emissions to land	●			

Table 32: Summary of regulatory controls to be applied during operation

		Controls (references are to sections below, setting out details of controls)				
		Infrastructure and equipment	Specified action	Monitoring	Reports	Limit
Risk Items (see risk analysis in Table 18)	Odour	●	●	●	●	
	Fugitive Dust	●	●			
	Point source emissions to air (gases and particulates)	●		●	●	●
	Emissions to land	●	●	●	●	●

10.1 Licence controls - Odour emissions during operation of asphalt plants

10.1.1 Infrastructure and equipment

The following requirements will be included in the Licence:

- Directing drum mixer emissions from asphalt plants to respective baghouse and ensuring that baghouse is operational prior to start-up of drum mixer and is operated continuously;
- Specifying stack height to aid dispersion of emissions;
- Requirement to have differential pressure monitoring on baghouse and to replace damaged or failed bags;
- Requirement to regulate temperature in bitumen storage tanks;
- Requirement to have over-temperature activated interlock on fuel supply to the drum mix burner.

Grounds: Baghouse installed on asphalt plants aids in removal of particulates and associated odorous compounds. This does not address odour emissions associated with VOCs. Maintaining process temperature and fuel supply to drum mixer can aid in minimising VOC emissions.

Height of emission point is one of the tools to aid in dispersion of an emission plume and to minimise ground impacts. Stack heights specified in the Licence will be sourced from the design specifications included in the Application. The Delegated Officer may consider amending the Licence in future to require the Licence Holder to undertake other infrastructure upgrades, such as increasing stack height and/or installing carbon activated filters on bitumen tanks, if odour emissions during operation result in significant complaints.

10.1.2 Specified actions

The following specified actions will be included in the Licence:

- Installation and maintenance of a meteorological monitoring station onsite to enable the Licence Holder to have access to real time data to make informed decisions and to manage Premises activities with the objective to mitigate / reduce potential odour emission impacts on receptors;
- Installation of a skirting system around all truck loading stations on the Premises to mitigate dispersion of odorous fumes during truck loading;
- Submitting an Odour Field Assessment Strategy with the objective of identifying conditions conducive to causing odour impacts; and
- Displaying a 24-hour contact number at the front gate to facilitate reporting of any complaints by community members.

Grounds: Odour emissions have been assessed as high risk. Odour emissions from truck loading have been assessed to be significant in terms of their overall contribution to odour emissions from Premises activities. These specified actions are targeted at mitigating odour impacts at receptors and improving the Licence Holder's efficiency in undertaking any mitigating actions by using real-time meteorological data to inform day to day operating decisions.

The Odour Field Assessment Strategy is a tool to identify specific meteorological conditions when odour impacts may be experienced. The Delegated Officer may consider amending the Licence subsequently to require the Licence Holder to undertake further odour mitigation actions once the proposed asphalt plants are operational, if significant odour complaints which can be attributed to Premises activities arise. Consideration will be given to prescribing a tiered approach for potential odour mitigation strategies, including:

- Infrastructure upgrades to install a fume extraction system for truck loading areas; and/or
- Suspending truck loading activities under certain meteorological conditions which are known to cause odour impacts and give rise to complaints; and/or
- A requirement to completely enclose truck loading areas (airtight) to ensure odorous fumes do not escape; and/or
- Odour Field Assessment Strategy required by the conditions of this Licence will be reviewed. The Licence will be subsequently amended to specify undertaking of odour field surveys. A monthly frequency (with at least 3 weeks apart) will be prescribed for Odour Field Assessment for the first four months reducing to six monthly frequency thereafter (whilst the Premises continues operating the transportable asphalt plants at the increased capacity authorised in this Licence) if it has been demonstrated that odour impacts due to Premises activity are low. This will include requirements to monitor odour intensity, frequency and characteristic within a one-kilometer radius from the operation.

10.1.3 Monitoring

The following requirements will be included in the Licence:

- Stack monitoring requirements for particulate matter and gases including VOCs;
- Requirement to monitor odour concentration at asphalt plant stacks; and
- Stack sampling and analysis to be undertaken by a holder of NATA accreditation.

Grounds: Concentration of VOCs and particulates in stack emissions will contribute to stack odour concentrations. Monitoring stack odour concentration is necessary to determine contribution of drum/mixer operation to overall odour emissions from the Premises. The monitoring data will inform any future field odour surveys and decisions relating to required infrastructure upgrades. Six monthly frequency for stack monitoring is considered appropriate.

10.1.4 Reporting and recordkeeping

The following requirements will be included in the Licence:

- Submission of stack monitoring reports; and
- Recording complaints received and actions taken

Grounds: These conditions are required to facilitate administration of the Licence. Complaints from the community provide an indication of the effectiveness of odour mitigating strategies implemented at the Premises.

Reporting requirements will be reviewed through subsequent Licence amendment once undertaking of Odour Field Assessment is prescribed.

10.2 Licence controls - Fugitive dust emissions during operation

10.2.1 Infrastructure and equipment

The following requirements will be included in the Licence:

- Infrastructure requirements specified in the *EP (Concrete Batching and Cement Product Manufacturing) Regulations* for the batching plant, block stone and paving manufacture operations on site;
- Raw material storage requirements for asphalt production;
- Requirement to activate water sprays when operating crushing and screening plant and fibre cement flail;
- Requirement to maintain enclosed conveyors used in asphalt plants;
- Requirement to review existing material conveyors used in concrete batching / cement products manufacturing operations on site which are not covered and a proposal with timeframe to cover them or alternatively demonstrating how those conveyors comply with *EP (Concrete Batching and Cement Products Manufacturing) Regulations 1998*.

Grounds: These conditions are required to minimise the risk of fugitive emissions impacting the environment and amenity. The *EP (Concrete Batching and Cement Products Manufacturing) Regulations 1998* apply to the batching plant, block stone and paving manufacture operations on the Premises. This Licence amendment includes changes to the Prescribed Premises boundary to include these operations.

10.2.2 Specified actions

The following requirements will be included in the Licence:

- Waste acceptance criteria to specify that waste containing asbestos or asbestos containing material is not crushed or screened on site;
- Waste acceptance criteria to specify that construction and demolition waste is not accepted or processed on site;
- Requirement to record Waste input and output;
- Requirements relating to fugitive dust emissions control consistent with the *EP*

(Concrete Batching and Cement Products Manufacturing) Regulations 1998;

- Requirement to transfer cement and lime from trucks to storage silos under negative pressure.
- Ensuring availability of a water cart and mechanical sweeper; and
- Covering all vehicles carting loose material which are likely to generate fugitive dust.

Grounds: These conditions are required to minimise the risk of fugitive emissions impacting the environment and amenity. The *EP (Concrete Batching and Cement Products Manufacturing) Regulations 1998* apply to the batching plant, block stone and paving manufacture operations on the Premises. This Licence amendment includes changes to the Prescribed Premises boundary to include these operations.

The Applicant intends to accept Waste containing malformed products / off specification products from other BGC operations outside the Premises boundary for the purpose of crushing and screening onsite prior to reuse in concrete products manufacturing activities. The Waste acceptance criteria are required to ensure that asbestos containing material is not processed on site as fugitive emissions of asbestos can give rise to health risks. Recording of inputs and outputs of Waste is necessary to identify sources of Waste coming into the Premises and to identify how any non-conforming Wastes have been managed by the Applicant.

10.3 Licence controls- Point source emissions to air during operation

10.3.1 Infrastructure and equipment

The following requirements will be included in the Licence:

- Directing drum mixer emissions from asphalt plants to respective baghouse and ensuring that baghouse is operational prior to start-up of drum mixer and is operated continuously;
- Specifying stack height to aid dispersion of emissions;
- Requirement to have differential pressure monitoring on baghouse and to replace damaged or failed bags;
- Inspecting baghouse on a daily basis when operated; and
- Retaining spare bag filters on the Premises.

Grounds: Baghouse installed on asphalt plants aids in removal of particulates. Height of an emission point is one of the tools to aid in dispersion of an emission plume and to minimise ground impacts. Stack heights specified in the Licence will be sourced from the design specifications included in the Application.

10.3.2 Point source emission to air- Limit

Particulate emission limit of 50mg/m³ will be included on the Licence for asphalt plant stacks. Condition will be added preventing processing of Recycled Asphalt Pavement on the Premises.

Grounds: Particulate emissions from asphalt plant stacks, if uncontrolled, can result in visible emissions, may impact receptor amenity and may degrade ambient air quality. The stack emission limit is hence required.

While reuse of Recycled Asphalt Pavement is a standard industry practice, it is known to alter the emissions profile during asphalt production. The additives, binders in RAP can increase VOC emissions and odour emissions from the process. The Applicant has noted that they do

not intend to use RAP in asphalt manufacturing on the Premises.

10.3.3 Monitoring

The following requirements will be included in the Licence:

- Stack emissions monitoring of particulates and gases for asphalt plants;
- Undertaking sampling in accordance with Australian Standard AS 4323.1; and
- Undertaking sampling and analysis by a holder of NATA accreditation.

Grounds: Stack emissions monitoring is required to ensure that the asphalt plants are operating within design specifications. Six monthly frequency is considered appropriate considering the increase in Premises production capacity which will occur as a result of this Licence and the proximity of receptors.

10.3.4 Reporting

Requirement for submission of monitoring reports will be included on the Licence.

Grounds: This requirement is necessary for administration of the Licence and for validating plant performance with the stack emission limit specified.

10.4 Licence controls - Emissions to land

10.4.1 Infrastructure and equipment

The Licence will include requirements to ensure that:

- Wastewater from truck and plant wash activities on the Premises is treated using an oil water separator prior to discharging to soak wells; and
- An oil water separator is installed to treat truck and plant wash water prior to discharge to infiltration basin.

Grounds: Truck and plant wash water is likely to be contaminated with hydrocarbons and surfactants. Truck and plant wash water being discharged via infiltration basins is not subject to any chemical or physical treatment.

The Application notes that groundwater at the Premises is likely to be 0.5-1.2metres below ground level. The condition is appropriate to ensure that wastewater discharge does not degrade groundwater quality.

10.4.2 Limit

The Licence will specify limits for wastewater quality discharged to land via infiltration basins and soak wells on the Premises in accordance with the criteria specified in the *Water Quality Protection Note 68, Mechanical equipment wash down, September 2013*.

Grounds: Truck and plant wash water is likely to be contaminated with hydrocarbons and surfactants. The Application notes that groundwater at the Premises is likely to be 0.5-1.2metres below ground level. The condition is appropriate to ensure that wastewater discharge does not degrade groundwater quality.

10.4.3 Monitoring

The Licence will include a requirement for monitoring wastewater quality discharged via infiltration basins and soak wells every six months.

Grounds: Monitoring requirements are necessary to ensure compliance with wastewater discharge limits.

10.4.4 Specified action

Requirements for managing wastewater from concrete batching and cement product manufacturing activities on the Premises in accordance with the *EP (Concrete batching and Cement products manufacturing) Regulations* will be included on the Licence.

Grounds: The *EP (Concrete Batching and Cement Products Manufacturing) Regulations 1998* apply to the batching plant and the block stone and paving manufacture operations on the Premises. This Licence amendment includes changes to the Prescribed Premises boundary to include these operations.

11 Determination of Licence conditions

The conditions in the issued Revised Licence in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

This amendment does not propose any change to the expiry date of the Existing Licence which is scheduled to expire on 30 January 2021.

Table 33 provides a summary of the conditions to be applied to this licence.

Table 33: Summary of conditions to be applied

Condition Ref	Grounds
Authorised Emissions Condition 1	These conditions authorise specified emissions controlled through conditions of the licence and general emissions associated with primary and contributory activities on the premises. These conditions are valid, risk-based and ensure appropriate linkage between the licence and the EP Act.
Infrastructure and Equipment Condition 2	These conditions are valid, risk-based and contain appropriate controls.
Specified actions	
Condition 3 through to Condition 29	
Point source emissions to air- Limit Conditions 20,21,22	
Monitoring point source emissions to air Conditions 23, 24,25	
Discharge to land- Limit Conditions 26, 27	
Discharge to land- Monitoring Conditions 28,29	These conditions are valid and are necessary for administration and reporting requirements to ensure compliance.
Reporting and Recordkeeping Conditions 30 through to 36	
Authorised works Conditions 37 through to 41	These conditions are valid, risk-based and contain appropriate controls.
Specified actions- Commissioning Conditions 42,43	
Point source emissions to air Validation Monitoring- Commissioning Conditions 44,45,46	
Specified actions- Reporting validation	These conditions are valid and are necessary for

monitoring results Conditions 47,48	administration and reporting requirements to ensure compliance.
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DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the licence under the EP Act.

12 Applicant's comments

The Licence Holder was provided with the draft Decision Report and draft Revised Licence on 6 December 2017. The Licence Holder provided comments on 12 December 2017 which are summarised, along with DWER's response, in Appendix 2.

13 Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Revised Licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Caron Goodbourn
Acting Manager Licensing (Process Industries)
 Delegated Officer
 under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	Availability
1.	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	Accessed at www.dwer.wa.gov.au
2.	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	
3.	DER, August 2016. <i>Guidance Statement: Licence duration</i> . Department of Environment Regulation, Perth.	
4.	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	
5.	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	
6.	BGC Licence Amendment Application Form; and BGC Hazelmere Industrial Complex - Supporting Document Licence Amendment L6533/1993/11	DWER Records (A1502383, A1502391)
7.	E-mail correspondence from Carl Barrett, BGC Group Manager Energy & Environment including following documents: <ul style="list-style-type: none"> Appendix 1- Emission estimates of hot mix asphalt production with reference to USEPA AP-42; Appendix 2,3,4 – Emissions data from asphalt plants comparable to those proposed to be installed onsite; Appendix 5- Dust Management Plan, BGC Hazelmere, October 2017; Appendix 6a and 6b- Operational Risk Assessment (Dust) and Risk Register; Appendix 7- Drawing indicating proposed location of additional bitumen and diesel tanks; and A word document providing response to the Department's Information Request letter dated 19 September 2017 	DWER Records (A1540678)
8.	Environmental Noise Assessment BGC Industrial Complex, Hazelmere, authored by Lloyd George Acoustics	DWER Records (A1553753)
9.	Odour Emissions Operations Review BGC Hazelmere Industrial Complex, dated November 2017	DWER Records (A1559837)
10.	Perth Groundwater Atlas	Accessed at http://atlases.water.wa.gov.au
11.	National Environmental Protection Measures, updated	Accessed at

	February 2016	https://soe.environment.gov.au/theme/ambient-air-quality/topic/2016/national-air-quality-standards
12.	Water Quality Protection Note 68, Mechanical equipment wash down, September 2013.	Accessed at http://www.water.wa.gov.au/search-publications
13.	NPI Emission Estimation Technique Manual for Hot Mix Asphalt Manufacturing, June 1999	Accessed at http://www.npi.gov.au/reporting/industry-reporting-materials/emission-estimation-technique-manuals

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder comment	DWER response
Condition 2, Table 3, Specification for Raw material storage (aggregate, sand, granular material except cement)	<ul style="list-style-type: none"> Occasionally raw materials (aggregate, sand, granular material except cement) are delivered to the premises and there is no practicable material bay of that aggregate/ sand specification available to accommodate it. EP (Concrete Batching and Cement Product Manufacturing) Regulations 1998 enable storage of aggregate/ sand in a stockpile on the ground if measures are taken to minimise airborne dust. <p>Point (i) should be reworded to reflect the same.</p> <ul style="list-style-type: none"> Requiring all material bins to be roofed will not achieve environmental gain. Most aggregate/ sand are of density that will not lift in most wind conditions experienced at the premises. Reporting through National Pollutant Inventory has not triggered red flag for particulate matter emissions. Point (iv) should be reworded to allow the use of sprinklers. 	The licence condition has been updated to accommodate changes requested.
Condition 2, Table 3, Specification for Cement lime storage silos	Clarification is sought on point (vi) as to whether recording of differential pressure as a weekly test is anticipated by this point. There is ambiguity in testing a system unless some form of evidence could be provided.	The Licence Holder should have internal procedures and records system to demonstrate compliance with this condition. The licence does not require submission of these records through Annual Reporting. Record-keeping requirements are specified in Condition 32.
Condition 2, Table 3, Specification for crushing and screening plant and fibre cement flail	<ul style="list-style-type: none"> Water sprays will not be required during rains or if raw materials are excessively wet. Use of sprinklers will be assessed by operators when weather conditions are conducive to potential dust emissions. Point (i) should be reworded to reflect this. Point (ii) should be reworded to be consistent with the EP (Concrete Batching and Cement Products Manufacturing) Regulations to authorise use of stockpiles when use of material bins or bays is not practicable. 	The licence condition has been updated to accommodate changes requested. Requirement to ensure that the Licence Holder takes necessary steps to minimise airborne dust from stockpiles has been added.
Condition 4,	<ul style="list-style-type: none"> Waste inputs should be allowed to be reported in tonnes. 	<ul style="list-style-type: none"> Table 5 updated to allow reporting of inputs in m³ or tonnes.

Condition	Summary of Licence Holder comment	DWER response
Table 5	<ul style="list-style-type: none"> Monitoring and recording of waste outputs should not be required. Currently the skip bin adjacent to crushing plant contains waste other than construction and demolition waste (eg: rubber gloves, food waste, rags, tree branches). The contents are not related to material input. BGC's waste service provider services the bin every 2-3 months. 	<ul style="list-style-type: none"> Requirements relating to non-confirming waste output will apply once the licence holder starts accepting off-spec products or other authorised material from its other operations. The purpose is to ensure that the Licence Holder tracks any non-confirming waste received and returns it to appropriate destination rather than accepting it on the premises. <p>Table 5 has been updated to reflect that recording of only non-confirming loads received is required.</p>
Condition 11	The conditions seems to imply that all tipper trucks that deliver sand and aggregates must be washed. The intent of this condition appears to be directed at concrete agitator trucks which would be fair and standard practice.	Noted. The condition aimed to target concrete batching activities. The Delegated Officer has considered the Applicant's comment and is of the opinion that the EP (Concrete batching and Cement Products Manufacturing) Regulations are adequate. Condition11 has been removed.
Condition 13 (Condition 12 due to renumbering conditions due to removal of a condition as above.)	Point (a)(ii) should be reviewed to remove the reference to 'all' particulate matter settling out in a settling pond.	The condition has been updated. New condition reference is 12(a)(ii).
Condition 17 and 20 (Condition 16 and 19 due to renumbering conditions due to removal of a	Timeframes for completion should be reviewed to allow 60 days for installation of a meteorological monitoring station and for submission of an Odour Field Assessment Strategy.	The Delegated Officer has considered the request and is of the opinion that 60 days is excessive. Given the high odour emission risk and taking into account the Applicant's comment, the timeframes have been revised to require completion by 20 January 2018.

Condition	Summary of Licence Holder comment	DWER response
condition as above.)		
Condition 19 (Condition 18 due to renumbering conditions)	Timeframe for installing a skirting system should be reviewed from 60 to 90 days.	Agreed. Condition updated.
Table 6	Reference to Source for emission point P1 should be updated to 'Fixed asphalt plant rotary dryer via baghouse dust collector'	Condition updated.
Table 8	BGC agrees to undertake monthly monitoring for the first three months of operating the proposed two asphalt plants. It is requested that monitoring frequency post this period should be six-monthly rather than quarterly. This is consistent with the monitoring regime for fixed asphalt plant specified in the existing licence.	Agreed. Condition updated. Table 8 has been updated to also clarify that differential pressure and inlet temperature monitoring requirements apply to respective baghouses on each asphalt plant. This change was conveyed to BGC via email on 8 December 2017 and no concerns were identified by BGC.
Table 10	Limits for pH should be aligned with the EP (Unauthorised Discharge) Regulations 2004. The limit values have been derived from the former Department of Water's Water Quality Protection Note 68 which are deemed 'indicative guide' and not rigid limit. It is unclear what footnotes 2,3 pertain to.	Limit for pH updated to maintain consistency with the EP (Unauthorised Discharge) Regulations 2004. Limits specified in the Table 10 for surfactants and TPH are derived from the Water Quality Protection Note and are absolute limits applied through conditions of the amended licence and not indicative guideline. Typo error corrected to remove reference to footnote 2 and 3.
Condition 41 (Condition 40 due to renumbering)	It is unlikely that all aspects in column 1 of Table 12 will go ahead. The wording of this condition may need to be revised to accommodate a reduced scope of works.	The Condition 40 pertains to submission of construction compliance certification. The Licence Holder is allowed to submit partial certification upon completion of works associated with each infrastructure/ equipment

Condition	Summary of Licence Holder comment	DWER response
conditions)		specified in column 1 of Table 12 and prior to operating that equipment to allow operational flexibility. The condition has been modified to make this clear.
Table 14	The table lists production, design capacities of transportable plants separate to the fixed plant. All plant capacities should summed into one combined approved capacity to allow flexibility and to offset any delays on the transportable plant output.	Noted. The Combined design capacity updated in Table 14.
Table 15	Reference to specific numbers of material bays should be removed as configurations can change to accommodate changes in inputs and outputs.	Noted. Table 15 updated.

Appendix 3: Figures

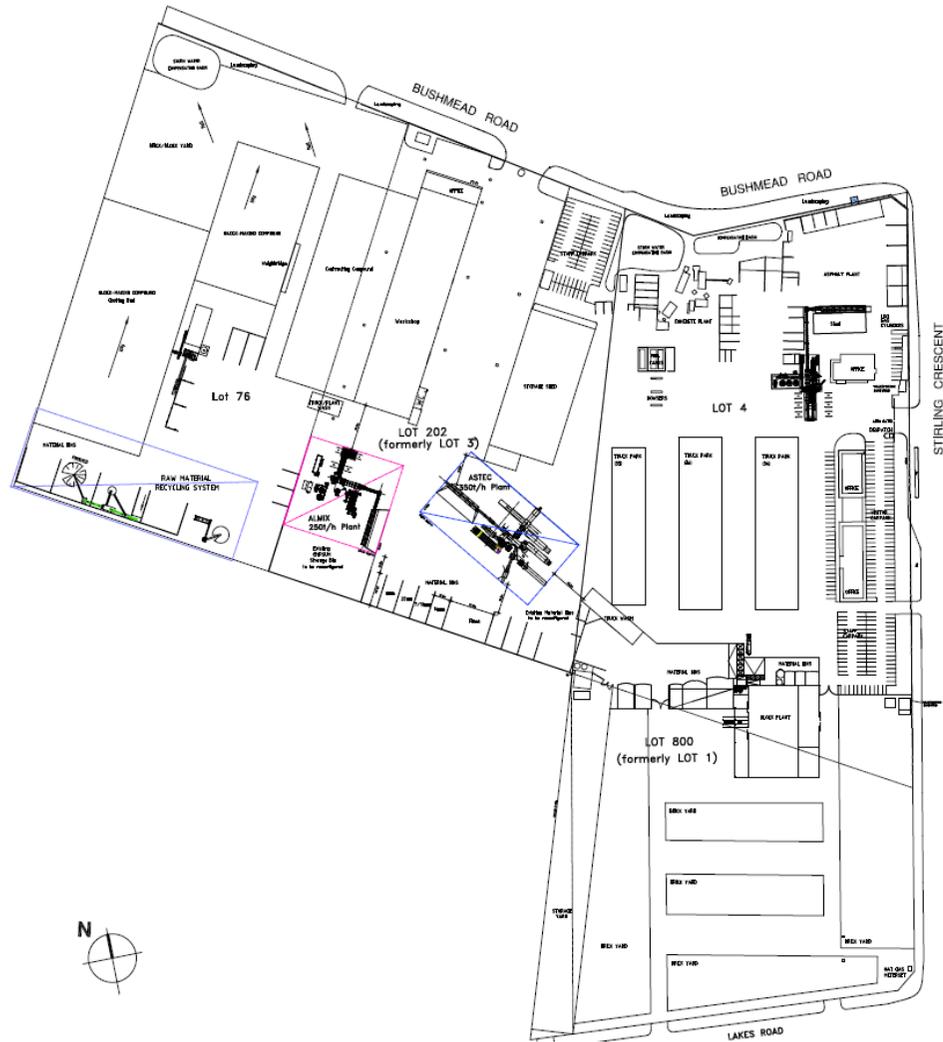


Figure 3: Plant layout - Hazelmere

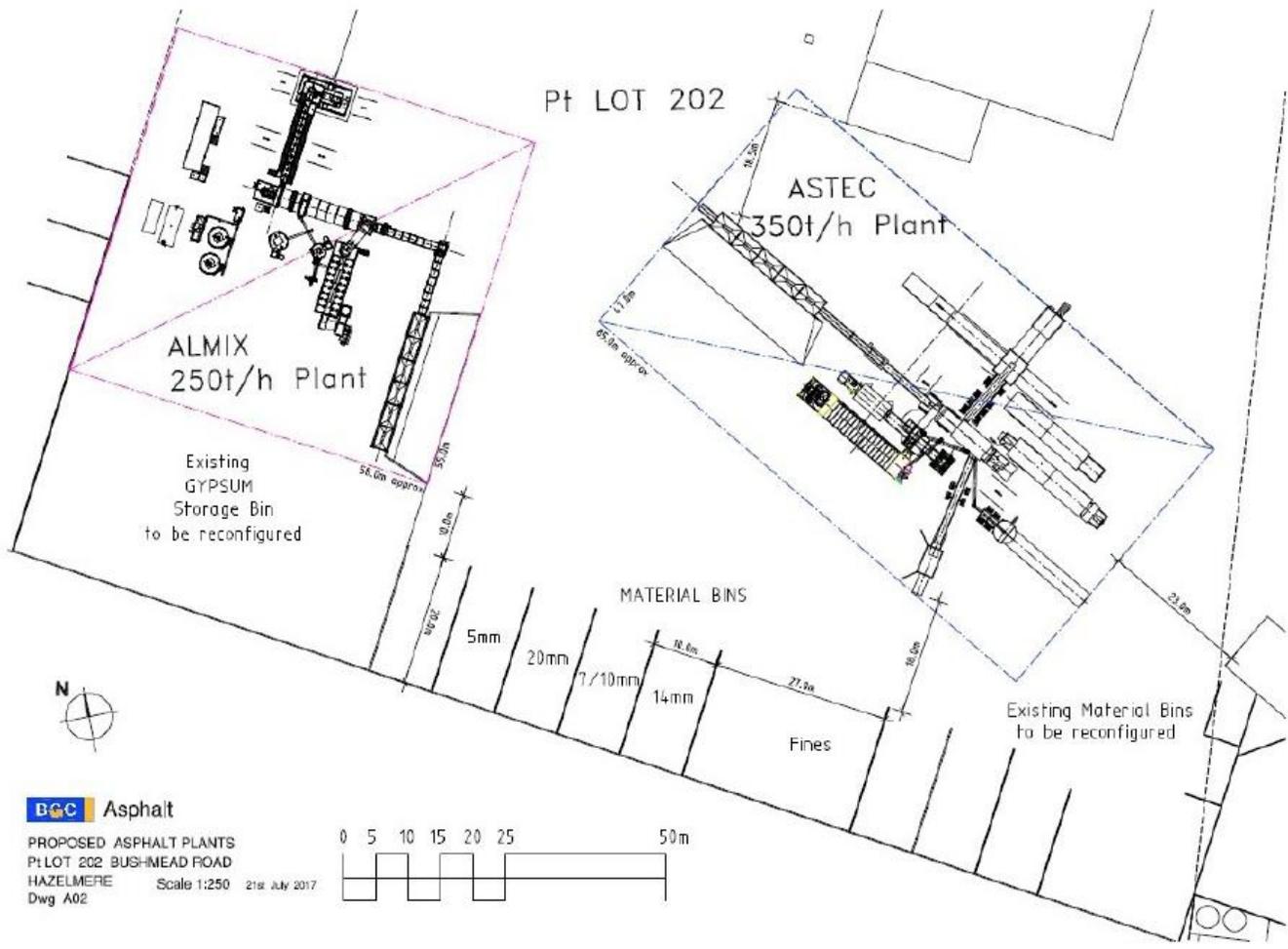


Figure 4: Proposed location of the two transportable asphalt plants on Lot 202

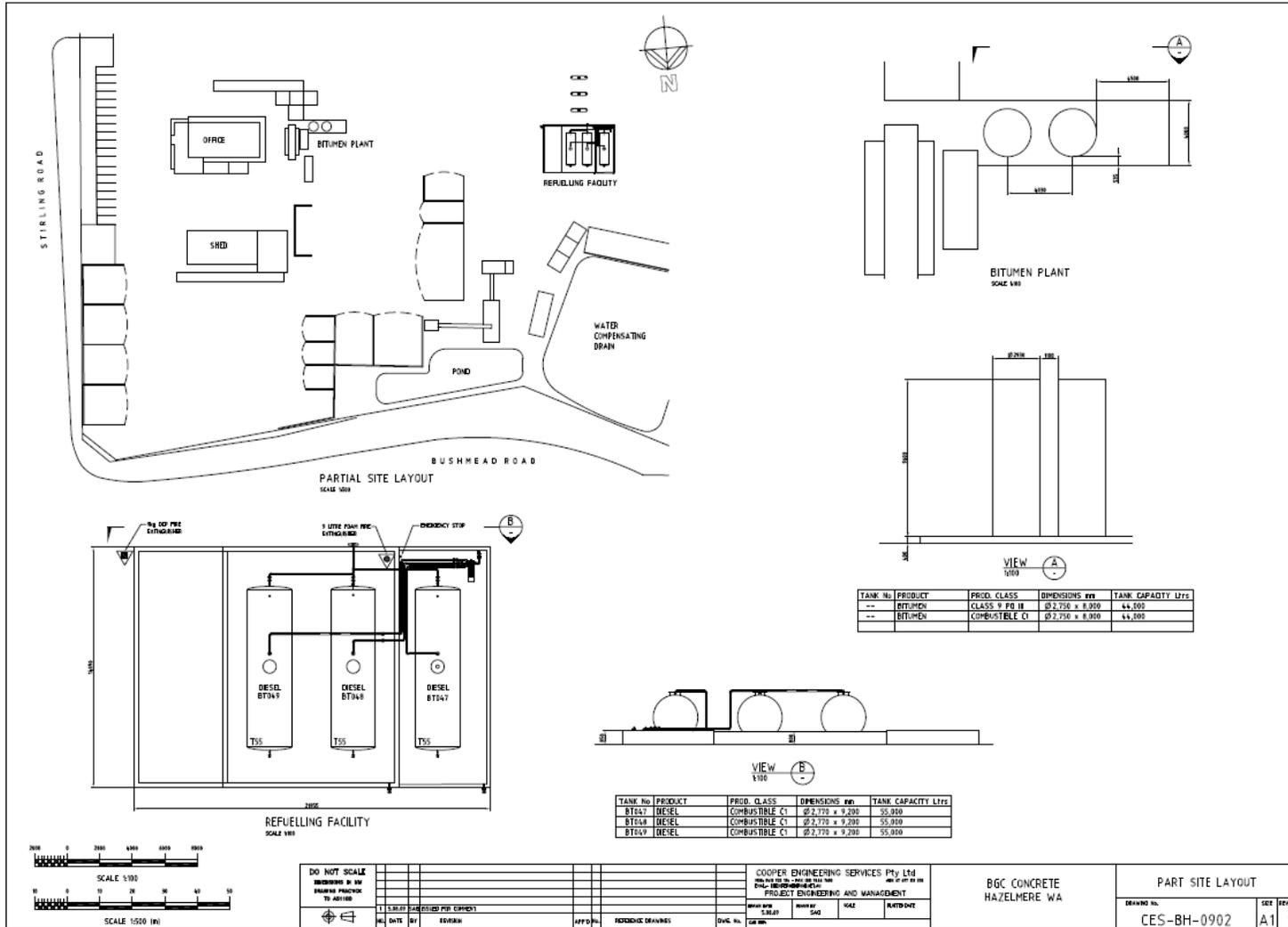


Figure 5: Existing fuel storage areas

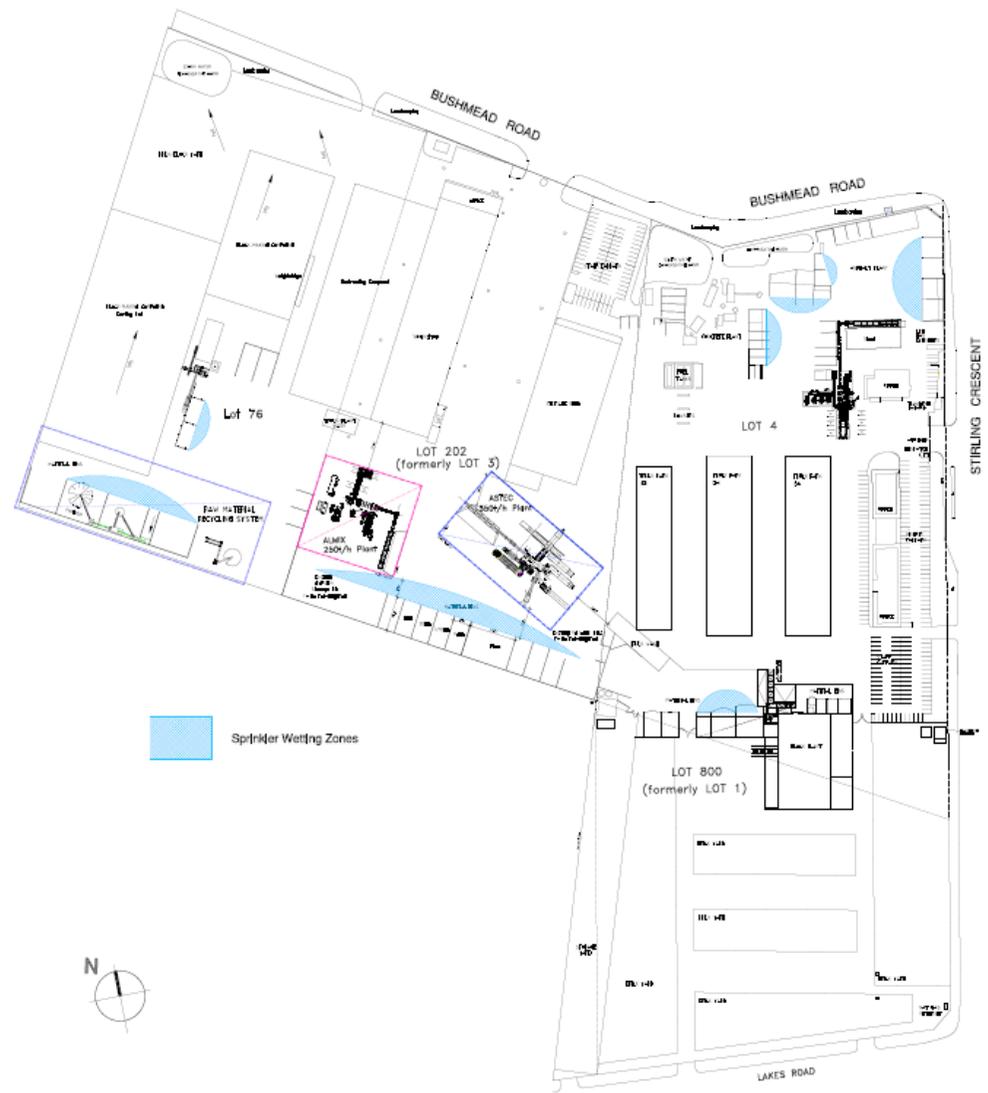


Figure 7: Sprinkler wetting zones

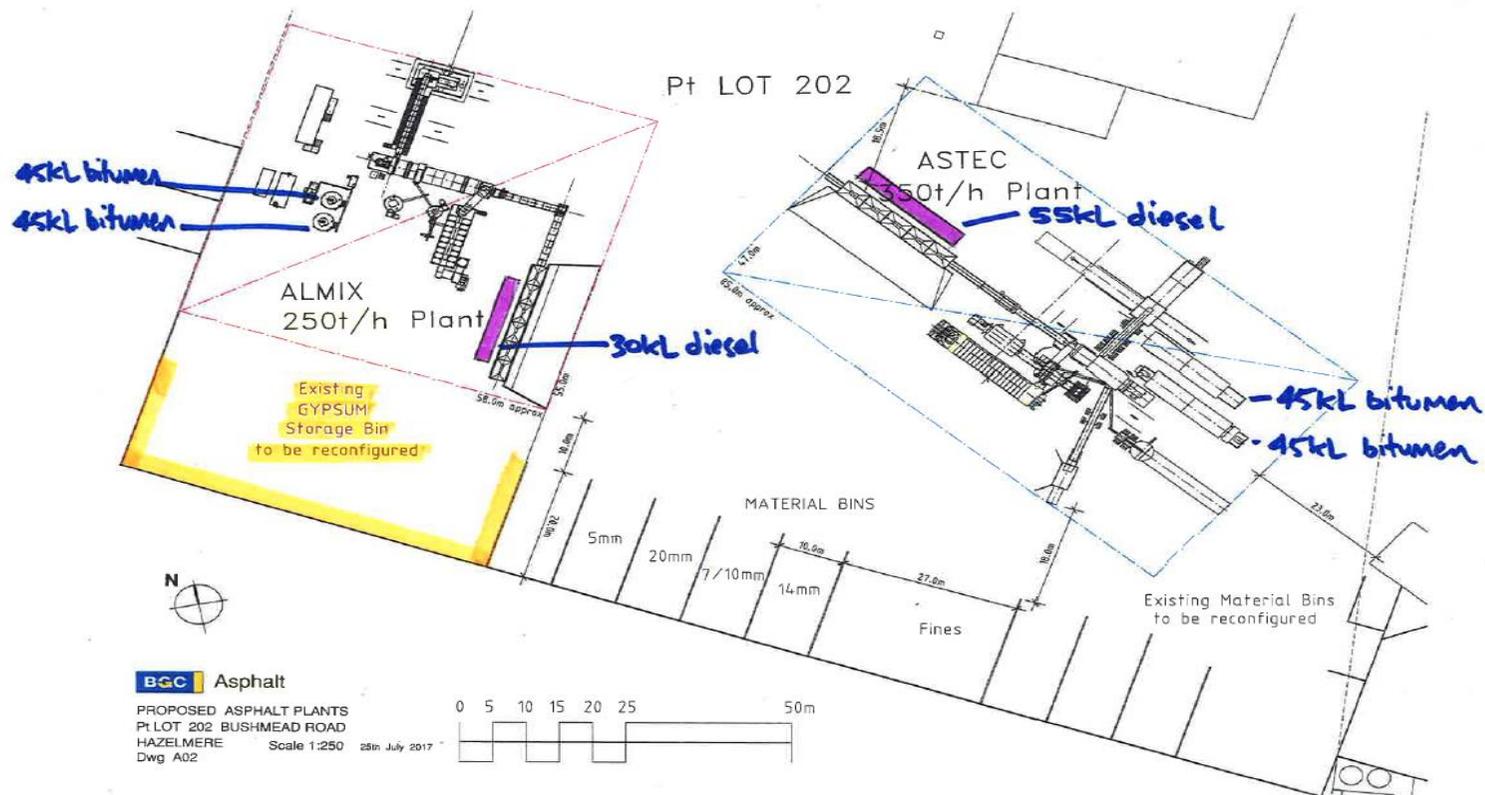


Figure 8: Proposed additional fuel storage areas

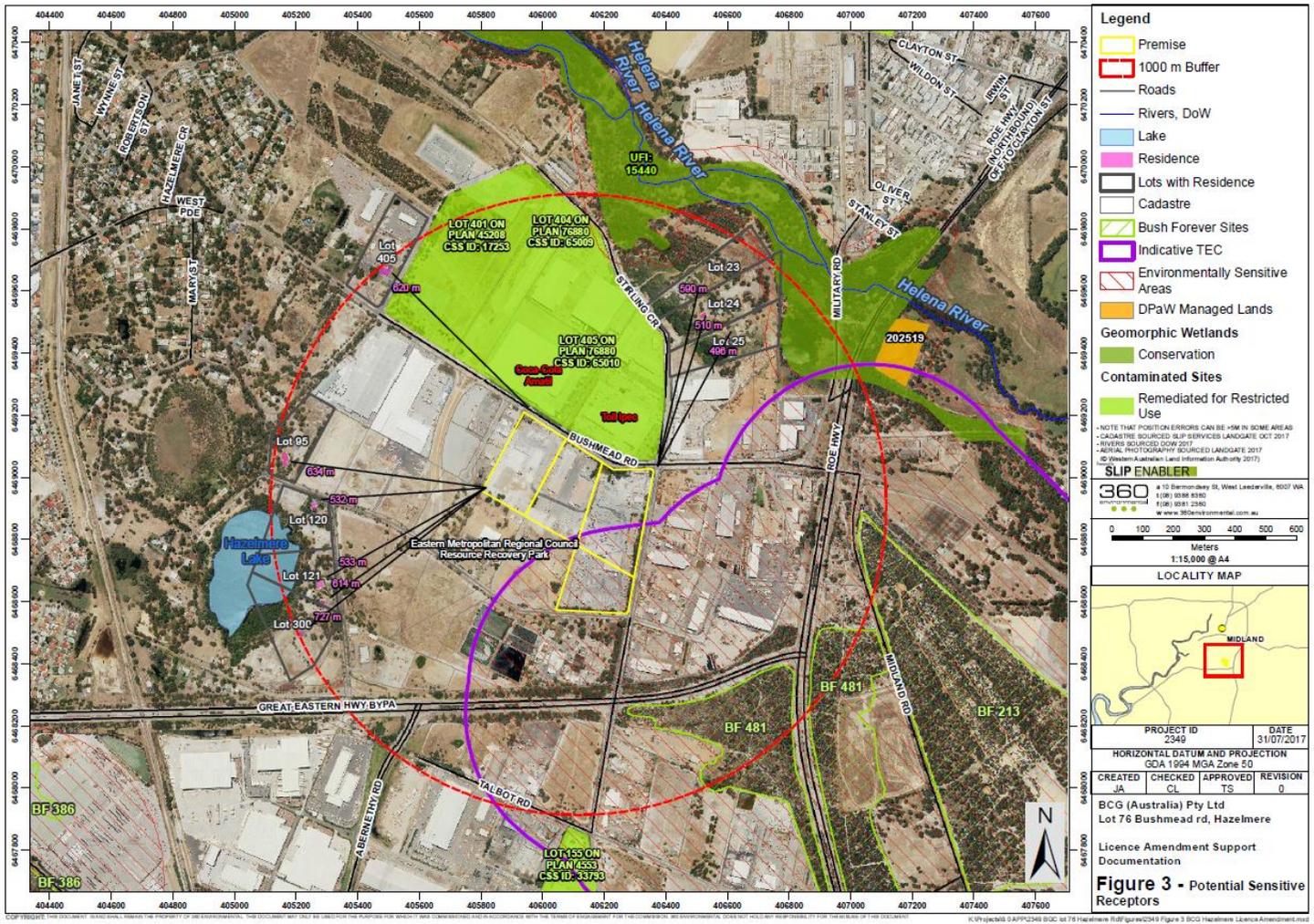


Figure 9: Location of sensitive receptors

Attachment 1: Revised Licence L6533/1993/1
