Government of Western Australia
Department of Environment Regulation

Works Approval

Works Approval Number	W6014/2016/1
Works Approval Holder	Salini Impregilo S.P.A. (ARBN: 159 573 896) and NRW Pty Ltd (ACN: 067 272 119) both trading as Salini Impregilo – NRW Joint Venture.
Registered business address	Salini Impregilo S.P.A. c/- Level 19, 99 Walker St NORTH SYDNEY NSW 2060 NRW Pty Ltd Level 1, 10 Kings Park Road WEST PERTH WA 6005
Address for notifications	Salini Impregilo – NRW Joint Venture 181 Great Eastern Highway BELMONT WA 6104
Duration	**Commencement date**: 30/01/2017 **Expiry Date**: 29/01/2020
Prescribed Premises	Category Number 77 – Concrete batching or cement product manufacturing
Premises	Forrestfield-Airport Link Concrete Pre-cast Plant 11 Carolyn Way FORRESTFIELD WA 6058 Being Lot 106 on Plan 36891 Certificate of Title Volume 2737 Folio 280

This Works Approval is granted to the Works Approval Holder, subject to the following conditions, on 25/01/2017 by:

Date signed: 25 January 2017

Caron Goodbourn
A/ Manager Licensing – Industry Regulation (Process Industries)
Licensing and Approvals
an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)

Premises Description

The ***Works Approval Holder*** is proposing to construct a concrete batching and cement product manufacturing plant on Lot 106 on Plan 36891 in Forrestfield, WA. Reinforced concrete ring segments will be manufactured using concrete produced on the premises. The ring segments will be assembled and installed inside excavated twin bored rail line tunnels to provide structure and stability.

The **Works Approval Holder** will be carrying out work on the premises that fall within Category 77 and as such the **Premises** are deemed a **Prescribed Premises** under the **EP Act**.

The **Premises** is situated within an existing industrial area. The nearest residential area is located 670m ESE and Crumpet Creek, a minor, seasonal flowing creek is located 300m S of the premises boundary.

Conditions

Environmental compliance

1. The ***Works Approval Holder*** must comply with the ***EP Act*** and all regulations prescribed under the ***EP Act*** and applicable to the Premises, including:

(a) the duties of an occupier under s 61;

(b) the duty to notify the ***CEO*** of discharges of waste under s 72; and

(c) not causing, or doing anything that is likely to cause, an offence under the ***EP Act***

except where the ***Works Approval Holder*** does something in accordance with a ***Condition*** which expressly states that a defence under s 74A of the ***EP Act*** may be available.

Premises

2. The ***Works Approval Holder*** must carry out the Works within the ***Premises*** in accordance with the requirements set out in Schedule 2.

3. The ***Works Approval*** applies to the ***Premises*** defined in the Premises Description Table, and as depicted in the Premises Map in Schedule 1.

Table 1: Premises Description Table

Premises Description	
General Location	**Legal land description, reserve or tenement (all or part)**
11 Carolyn Way FORRESTFIELD WA 6058	Being Lot 106 on Plan 36891 Certificate of Title Volume 2737 Folio 280

Location of Works

4. The ***Works Approval Holder*** must locate the Works generally in accordance with the Site Plans in Schedule 1.

Infrastructure and Equipment

5. Subject to Condition 6, on completion of the Works, the ***Works Approval Holder***

must provide to the ***CEO*** engineering or building certification from a suitably qualified professional confirming each item of infrastructure or component of infrastructure specified in column 1 with the requirements specified in column 2, as set out in Table 2, have been constructed with no material defects.

6. The ***Works Approval Holder*** must not depart from the requirements specified in column 2 of Table 2 except:

(a) where such departure is minor in nature and does not materially change or affect the infrastructure; or

(b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment;

and all other ***Conditions*** in this ***Works Approval*** are still satisfied.

7. If Condition 6 applies, then the ***Works Approval Holder*** must provide the ***CEO*** with a list of departures which are certified as complying with Condition 6 at the same time, and from the same professional, as the certification under Condition 5.

Table 2: Infrastructure Requirements

Infrastructure	Requirements (design and construction)
General	- Existing shed for the pouring and compaction of segment moulds
Concrete Batching area (including raw materials storage area)	- Three, cement and silica fume fully enclosed 100 tonne storage silos fitted with dust filtration systems, relief pressure valves and level indicators with sirens that comply with Australian Standards. In particular: • The cement and silica fume silos will be fitted with a silotop dust filter with 24m^2 cartridge filter and the outlet is vented to within 1m of the ground; and • The silos are fitted with anti-overflow protection devices, including warning lights, audible alarms, automatic high level switches and fill pipe shutoff. - Fully sealed system (screw conveyor) for the transfer of cement and silica fume from the storage silos to the batching plant. - Five, 40m^3 roofed and shielded sand and aggregate holding/feed hoppers. - Five, 200-300m^3 three sided sand and aggregate ground storage bins fitted with water sprayers. - Conveyor system fitted with windshields for the transfer of sand and aggregates from the holding/feed hoppers to the batching plant. - Raw materials to be mixed in a fully enclosed wet process orbital batching plant. - Soak wells to capture clean and potentially contaminated stormwater. - Pipe network to direct excess stormwater to the main infiltration pond. - Two 10,000L bunded admixture storage tanks. - 20kL slurry pit designed to capture the initial 10mm of rainfall from the concrete batching area. - Float valve on the slurry pit designed to activate the chemical dosing unit pump when water level in the slurry pit reaches the maximum production water height (5kL). - Kerbing and speed bumps to direct potentially contaminated stormwater from the concrete batching area to the slurry pit. - Two 4m x 4m x 1m (12m^3 capacity) settlement pits designed to contain wastewater from the concrete batching operations, which then allow settled wastewater to flow into the slurry pit.
Segment Carousel	- Two sumps, one at each end of the carousel to capture any washdown water from the cleaning of segment moulds.
Secondary curing area	- Sump to capture any wastewater from the secondary curing area.

Records and Information

8. The ***Works Approval Holder*** must maintain accurate records including information, reports, and data in relation to the Works.

9. All information and records required under this Works Approval must:

(a) be legible;

(b) if amended, be amended in such a ways that the original and subsequent amendments remain legible or are capable of retrieval; and

(c) be retained for six years after the expiry of this Works Approval

Reports

10. If requested by the ***CEO*** from time to time, the ***Works Approval Holder*** must provide the ***CEO*** with reports or information relating to the Works, the Premises or any ***Condition*** in this ***Works Approval*** (including data from any monitoring ***Conditions***, environmental risk assessment studies).

11. Reports or information must be in such form as the ***CEO*** may require in a ***CEO*** Request.

Requests for Information

12. The ***Works Approval Holder*** must comply with a ***CEO Request*** within 7 days from the date of the ***CEO Request*** or such other period specified in the ***CEO Request***.

Definitions and Interpretation

Definitions

In this Works Approval, the following terms have the following meanings:

CEO Request means a request made by the CEO to the Works Approval Holder in writing, sent to the Works Approval Holder's address for notifications as described at the front of this Works Approval, in relation to:

(a) information, records or reports in relation to specific matters in connection with this Works Approval including in relation to compliance with any conditions and the calculation of fees (whether or not a breach of a condition or the EP Act is suspected); or

(b) reporting, records or administrative matters:

(i) which apply to all works approvals granted under the EP Act; or

(ii) which apply to specified categories of works approvals within which this Works Approval falls.

Condition means a condition to which this Works Approval is subject under s 62 of the EP Act, and as set out in section 2 of this Works Approval.

EP Act means *Environmental Protection Act 1986* (WA).

EP Regulations means *Environmental Protection Regulations 1987* (WA).

Premises refers to the premises to which this Works Approval applies, as specified at the front of this Works Approval and as shown on the map in Schedule 1 to this Works Approval.

Prescribed Premises refers to premises prescribed under Schedule 1 of the EP Regulations.

Works Approval refers to this document, which evidences the grant of the works approval by the CEO under s 57 of the EP Act, subject to the conditions.

Works Approval Holder refers to the occupier of the premises being the person to whom this Works Approval has been granted, as specified at the front of this Works Approval.

Interpretation

In this Works Approval:

(a) the words "including", "includes" and "include" will be read as if followed by the words "without limitation";

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a Condition, each row in a table constitutes a separate Condition; and

(d) any reference to an Australian or other standard, guideline or code of practice in this Works Approval means the version of the standard, guideline or code of practice in force at the time of granting of this Works Approval and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the Works Approval.

Works Approval document history

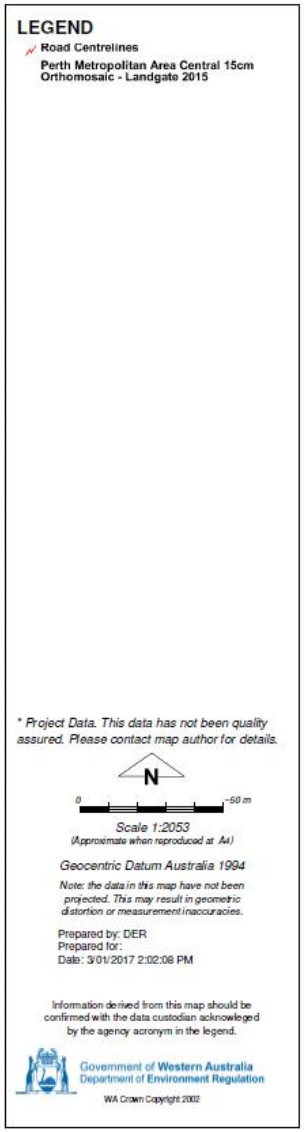
Where this Works Approval has been amended, and revised Works Approvals have been issued, the document history is set out below.

Amendment Description	Date	Revision No
First issue	25/01/2017	0

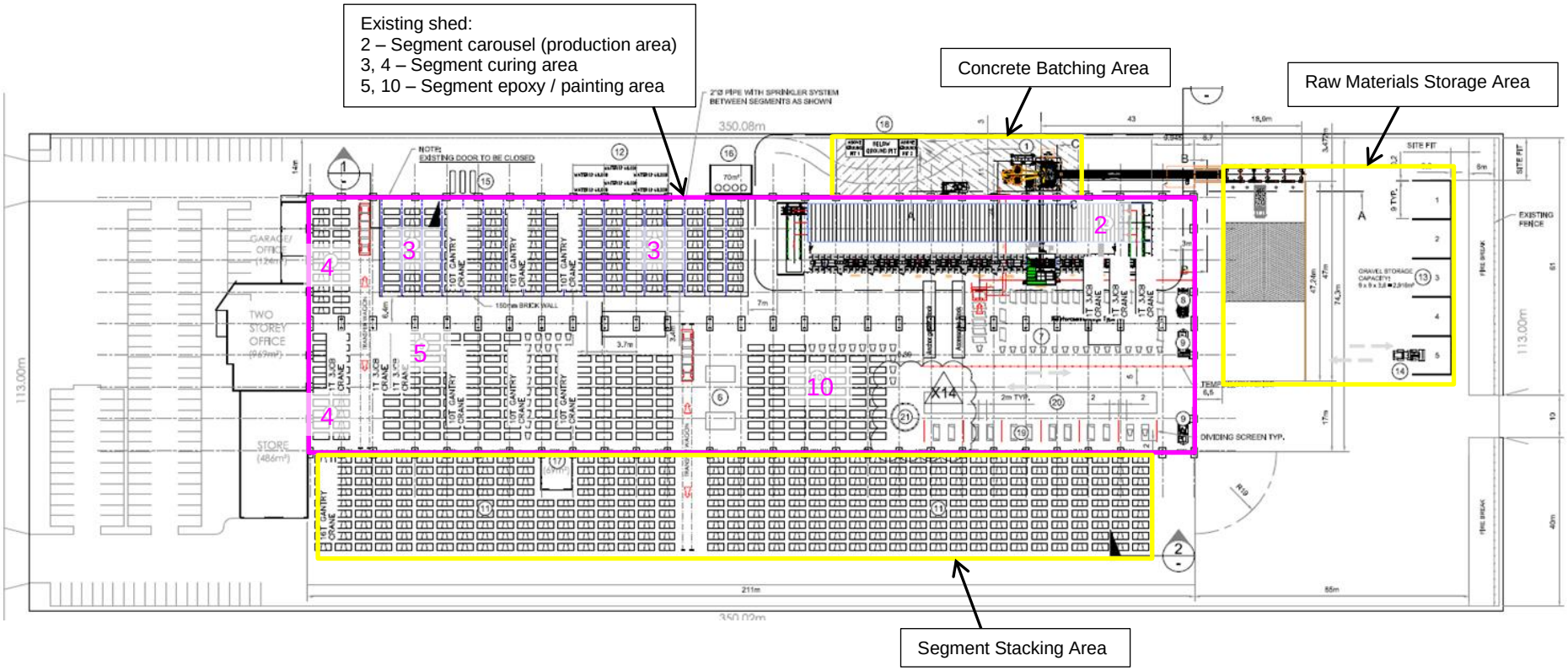
Schedule 1: Site Plans

Premises Map

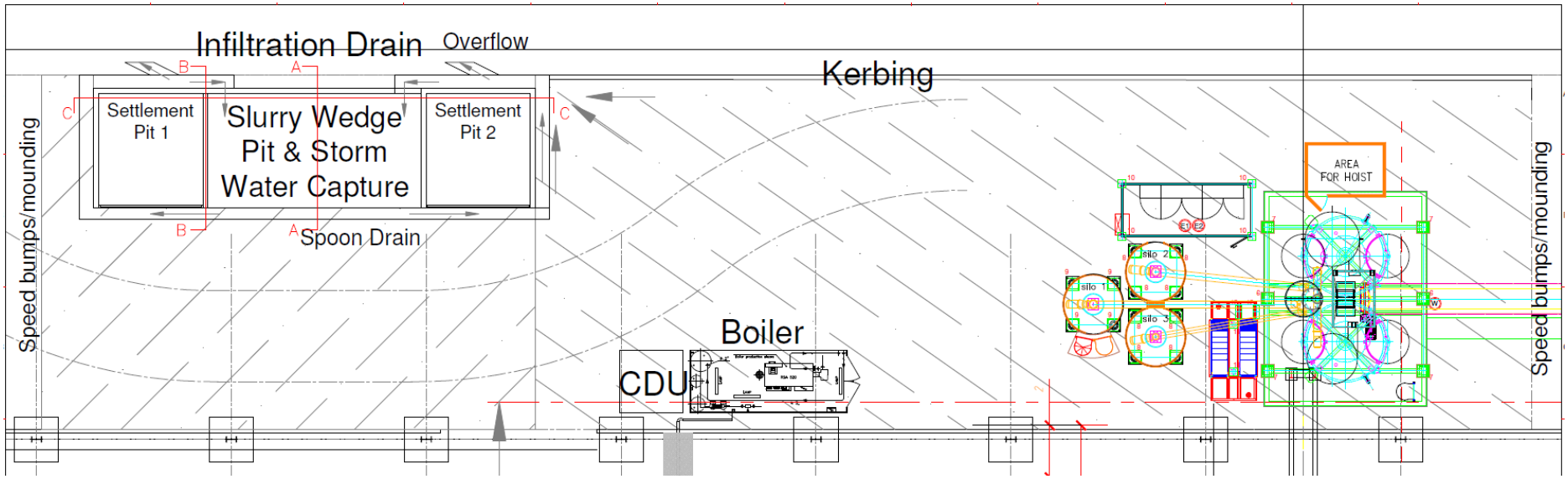
The ***Premises*** is shown on the map below. The pink line depicts the boundary to the ***Premises***.



General Layout Plan



Concrete Batching Area Plan



Schedule 2: Works

The Works to be carried out on the Premises are specified in the table below:

Item	Works	Specifications/Drawings
1	Raw materials storage area	Site plans: General Layout Plan
2	Concrete batching area	Site plans: General Layout Plan and Concrete Batching Area Plan
3	Above ground settlement pits and below ground slurry pit	Site plans: Concrete Batching Area Plan
4	Segment carousel (production area)	Site plans: General Layout Plan
5	Secondary curing / standby area	Site plans: General Layout Plan
6	Segment epoxy / painting area	Site plans: General Layout Plan
7	Segment Stacking Area	Site plans: General Layout Plan

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Applicant:	Salini Impregilo S.P.A. (ARBN: 159 573 896) and NRW Pty Ltd (ACN: 067 272 119) both trading as Salini Impregilo – NRW Joint Venture
Works Approval Number:	W6014/2016/1
File Number:	DER2016/002248
Premises:	Forrestfield-Airport Link Concrete Pre-cast Plant 11 Carolyn Way FORRESTFIELD WA 6058. Being Lot 106 on Plan 36891 Certificate of Title Volume 2737 Folio 280
Date of report:	**Wednesday, 25 January 2017**
Status of Report	Final

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Definitions of terms and acronyms

Term	Definition
AHD	Australian Height Datum
Applicant	Salini Impregilo S.P.A. and NRW Pty Ltd both trading as Salini Impregilo – NRW Joint Venture
Category/Categories (Cat.)	categories of prescribed premises as set out in Schedule 1 of the EP Regulations
CDU	Chemical Dosing Unit
CPP	Concrete Pre-cast Plant
DAA	Department of Aboriginal Affairs
DER	Department of Environment Regulation
Decision Report	this document
Delegated Officer	An officer under section 20 of the EP Act.
DoE	Commonwealth Department of the Environment and Energy
DoW	Department of Water
DPaW	Department of Parks and Wildlife
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
FAL	Forrestfield-Airport Link
GIS	Geographical Information System
m^3	cubic metres
mbgl	metres below ground level
mg/L	Milligrams per litre
MS	Ministerial Statement
NEPM	National Environmental Protection Measure
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)

Premises	Forrestfield-Airport link Concrete Pre-cast Plant
Prescribed Premises	Premises prescribed under Schedule 1 to the EP Regulations
RIWI Act	*Rights in Water and Irrigation Act 1914*
$\mu g/m^3$	micrograms per cubic metre
Unauthorised Discharges Regulations	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)

1. Purpose and scope of assessment

An application for works approval has been received from Salini Impregilo S.P.A. and NRW Pty Ltd both trading as Salini Impregilo – NRW Joint Venture (the ***Applicant***) for the Forrestfield-Airport Link (***FAL***) Concrete Pre-cast Plant (***CPP***) (***category*** 77), which is a new facility to be constructed as part of the FAL Project in Forrestfield, Western Australia.

2. Background

The Applicant has been awarded the design, construct and maintenance contract for the FAL Project; an 8.5km spur rail line from east of Bayswater Station, on the existing Perth to Midland line, to Forrestfield. The majority of the rail line will be constructed underground within twin bored tunnels that will be lined with reinforced concrete segments to provide structure and stability for the tunnel.

The FAL CPP will manufacture the reinforced concrete ring segments using concrete produced on the ***premises***. One complete ring is made up of six individual segments which are assembled and installed inside the excavated tunnel. Each concrete segment weighs approximately 5 tonnes and it is anticipated that 22 to 25 complete rings will be manufactured per day.

Up to 500 ring segments will be stored on site, prior to being transported and stored at the Forrestfield Station Area, approximately 4km north of the premises.

Table 1: *Prescribed Premises* Categories

Classification of Premises	Description	Approved premises production or design capacity or throughput
Category 77	Concrete batching or cement products manufacturing: premises on which cement products are manufactured for use at places or premises other than those premises.	220,000 tonnes per year

3. Overview of FAL Concrete Pre-cast Plant

3.1 Infrastructure

The FAL CPP facility infrastructure, as it relates to Category 77 activities, is detailed in Table 2 and with reference to the Site Plan.

Table 2: FAL CPP infrastructure

	Infrastructure
	Prescribed Activity Category 77
Concrete Batching	
1	Raw materials storage area
2	Concrete batching area (including above ground settlement pits and below ground slurry pit)
Cement Product Manufacturing	
3	Segment carousel (production area) - to be located within existing shed

	Infrastructure
4	Secondary curing / standby area – to be located within existing shed
5	Segment epoxy / painting area – to be located within existing shed
6	Segment Stacking Area

3.2 Construction and Operational aspects

3.2.1 Construction

The premises is located in an existing industrial area with the following existing infrastructure:

- Workshop (shed) (12,795m^2);
- Store (486m^2);
- Car parking bays (142 car bays);
- 6 x 10 tonne gantry cranes (internal);
- 6 tonne jib crane (internal);
- 16 tonne (two 8 tonne hoists) gantry cranes (external); and
- Sealed pavement surrounding workshop.

Construction will include the following:

- Concrete batching plant installation including civil and structural works; and
- Installation of pre-cast carousel and minor civil works.

3.2.2 Operation

The FAL CPP will manufacture reinforced concrete ring segments using concrete produced on the premises, operating 24 hours a day, 365 days a year for approximately 2 to 3 years.

Concrete Batching

Raw materials will be transported to site by trucks with approximately 20 deliveries per day, 6 days per week. Cement and silica fume will be transported to site in sealed pneumatic tankers that will discharge the cement and silica fume directly into sealed storage silos. The silos will be fitted with level sensors, pressure relief valves and filters. Aggregates and sand raw materials will be directly unloaded into roofed and shielded hoppers. If required, additional sand and aggregates will be stored in partially-enclosed (three sides and a roof) ground storage bins. Water and admixtures will be stored in tanks with the admixture tanks to be contained in a sealed bunded area.

Raw materials (cement, silica fume and admixtures) will be fed into the concrete batcher in controlled quantities using direct input (sealed screw conveyors will be used to transfer cement and silica fume) and enclosed or wind shielded conveyors (sand and aggregates). If required, sand and aggregates will be transported from the ground storage bins to the hoppers by front end loader.

The concrete will then be transported from the batching plant to the segment carousel, which will be located inside the existing warehouse, through direct discharge from fly buckets with a maximum discharge height of 0.5m.

Segment Manufacturing

Prior to concrete being poured, each steel mould will be cleaned (if required) and lubricated. Once the concrete has been poured it will be compacted by pneumatic vibrators fixed underneath the moulds. Each mould will have two or three pneumatic vibrators. The edges will be smoothed manually using steel trowels to ensure the concrete is flush with the sides of the mould.

The carousel will then move the segments to the steaming room to be cured for up to 6 hours. Steam will be provided by one steam boiler, which will be located outside the existing warehouse. Once steam curing is completed the segments will be removed from the moulds on the carousel and placed in a secondary curing / standby area, which will be located within the existing warehouse, for up to three days to allow them to cool.

Each concrete segment will then be sprayed with two coats of protective coating before being moved to the stacking yard, to be located outside the existing warehouse. Segments will be stacked in bundles of six segments and covered with a flexible sun/rain tarpaulin. The premises will have the capacity to store up to 500 segments.

The bundled segments will periodically be loaded onto double road trains via a gantry crane and transported approximately 4km north to the Forrestfield Station Area prior to use in the twin bored tunnels. Transportation of the bundled segments will only occur during daylight hours with approximately 10 road trains per day (one per hour).

Wastewater and potentially contaminated stormwater

Wastewater will be generated from the concrete batching process, boiler and secondary concrete curing area. Stormwater may be potentially contaminated through contact with cement and other materials in the concrete batching area and raw material storage area.

Potentially contaminated stormwater from the concrete batching operations will be directed towards a slurry pit by speed bumps and kerbing that will be constructed around the batching area. Process water from the concrete batching operations will be directed to one of two above ground settlement pits that then drain into a below ground slurry pit. The settlement and slurry pits are cleaned out as required.

The slurry pit has been designed to capture the first flush (10mm rainfall event) of rainfall. Once the slurry pit reaches maximum capacity, stormwater is directed, via gravity flow, to the northwest infiltration drain via an outlet located at least 1m from the slurry pit. Once the wastewater level in the slurry pit reaches maximum capacity (5kL) the wastewater will be treated via a chemical dosing unit to lower pH. Treated wastewater will either be reused in the boiler or concrete batching operations (pumped to a storage tank) or discharged to the infiltration drain.

The secondary curing area includes a sprinkler system to keep the concrete segments moist. Any runoff is captured in a sump that is then treated, if required, via pumping to the slurry pit and treating via the chemical dosing unit (to lower pH) or recycled for use in the sprinkler system.

Condensate water from the boiler is captured and recycled for use back in the boiler. Blowdown water from the boiler will be discharged into the slurry pit for settlement and treatment.

Segment moulds will only be washed out as required with any wastewater being collected in sumps. No washdown will occur in the segment epoxy/painting areas.

All stormwater on the premises is directed to one of 14 existing soak wells, a 300m long infiltration drain located along the northwest boundary or a 750m^2 infiltration pond located on the southwest end of the premises. The soak wells are connected to each other with overflow being directed via existing pipework to the main infiltration pond. Each soak well is designed to retain sediment in the base; however, inlet protection / silt traps will be installed, if deemed

necessary, to filter stormwater prior to entering the pits. Potentially contaminated stormwater from around the raw material storage area will be directed to the existing soak wells.

4. Legislative context

4.1 Part IV of the EP Act

4.1.1 Background

The FAL CPP supports the FAL Project which was formally assessed by the Environmental Protection Authority (***EPA***). Ministerial Statement (***MS***) 1022 was published for the FAL Project on 13 November 2015 with changes to the proposal approved under s45C on 23 March 2016 and 1 September 2016. The FAL CPP is outside the development envelope for the proposal referred to the EPA; therefore, there are no conditions in MS 1022 relevant to the FAL CPP.

4.2 Other relevant approvals

4.2.1 Planning approvals

Planning approval was approved by the Shire of Kalamunda in November 2016 subject to conditions that include wastewater, stormwater, dust and traffic management.

The application for works approval was referred to the Shire of Kalamunda on 19 December 2016 as a direct interest stakeholder as outlined in section 5. No comments were received.

4.2.2 Department of Water

The application for works approval was referred to the Department of Water on 19 December 2016 as a direct interest stakeholder as outlined in section 5.

The Department of Water provided no specific comments on the application; however, they made a general comment that stormwater management should be in accordance with the Stormwater Management Manual for Western Australia (***DoW***, 2004-2007).

4.2.3 *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

The FAL Project was referred to the Commonwealth Department of the Environment and Energy (***DoE***) under Part 7 of the ***EPBC Act***. The DoE determined that the Project does not require assessment and approval by the Australian government.

4.2.4 Department of Aboriginal Affairs

A Section 18 Clearance from the Department of Aboriginal Affairs (***DAA***) has been obtained for the registered Aboriginal Heritage sites that fall within the FAL Project footprint.

4.3 Part V of the EP Act

4.3.1 Guidance Statements

The overarching legislative framework of this assessment is the ***EP Act*** and ***EP Regulations***.

DER Guidance Statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (August 2016)*

- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Decision Making (November 2016)*
- *Guidance Statement: Risk Assessments (November 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*

Other applicable legislation includes:

Environmental Protection (Noise) Regulations 1997

Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998

Environmental Protection (Unauthorised Discharges) Regulations 2004

4.3.2 DER Noise Branch technical review

The Applicant's *Environmental Noise and Vibration Assessment* provided as part of the Application was reviewed by DER's Noise Regulation Branch.

The Noise Regulation Branch concluded that noise emissions from the proposed facility should be able to be readily managed to comply with the EP ***Noise Regulations*** as the major precast operation will be conducted inside an existing shed and the closest residential receptor is 670m away.

Nosie Regulation Branch does not recommend noise monitoring at the premises during operation.

5. Consultation

DER referred the application on 19 December 2016 to the Department of Water and the Shire of Kalamunda, as the ***Delegated Officer*** considered that they have a direct interest in the application.

DER publically advertised the application in *The West Australian* newspaper and on the DER website on 19 December 2016. No submissions were received.

6. Location and siting

6.1 Siting context

The FAL CPP will be located on Lot 106 on Plan 36891 Carolyn Way, Forrestfield within the Shire of Kalamunda. The premises and surrounding area is zoned as General Industry under the Shire of Kalamunda's Town Planning Scheme No. 3. The nearest residential area is located 670m east south-east of the Premises.

6.2 Residential and sensitive premises

The distances to residential and sensitive receptors are as follows:

Table 3: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential Area	670m ESE (measured from the premises boundary)
Special Rural Area	1.1km NE (measured from the premises boundary)
Aboriginal Site of Significance	Premises is located within the buffer zone for the Poison

	Gully Creek site (ID 25023) – Birth place / water source with female access only.
Neighbouring commercial / industrial premises	Immediately adjacent to the Premises with the closest neighbouring buildings located approximately 35m northwest of the Premises boundary.

6.3 Specified ecosystems

The distances to specified ecosystems are shown in Table 4.

Table 4: Specified ecosystems

Specified ecosystems	Distance from the Premises
Geomorphic Wetlands Swan Coastal Plain (management)	Premises located within a Palusplain multiple use geomorphic wetland.
Threatened Ecological Communities	Premises within the buffer zone for two threatened ecological communities
Bush Forever	230m SE (measured from the premises boundary) 660m SE (measured from the premises boundary) 740m NE (measured from the premises boundary) 860m W (measured from the premises boundary)
DPaW Nature Reserve	630m S (measured from the premises boundary)
Acid sulfate Soils	Low to moderate risk of acid sulfate soils immediately E of the premises boundary

6.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 5.

Table 5: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental Value
Middle Canning – Canning River Surface Water Management Subarea	Whole of premises with the Canning River located 8km SE of the premises boundary.	Water from the Canning River is used for agricultural purposes through licensed users and landholders with riparian rights.
Crumpet Creek	Minor, seasonal flowing creek, approximately 6.72km in length, located 300m S of premises boundary.	Surrounding area includes residential, parks and recreation, special rural (including keeping of stock and horses), general and light industry.

Poison Gully	Also known as Nestle Brae Creek. Minor, seasonal flowing creek, approximately 7.07km in length, located 1.8km N of premises boundary.	Surrounding area includes residential, parks and recreation, special rural (including keeping of stock and horses) general and light industry. Leaving the Shire of Kalamunda it flows into Munday Swamp, a significant wetland and Aboriginal Heritage Site.
Groundwater	The application provides that the depth to groundwater is approximately 10***mbgl***. The Department of Water's (DoW) Perth Groundwater Atlas indicates that the depth of groundwater beneath the Premises ranges from 9.5 m below the natural surface in the western corner of the Premises to 11.5m below the natural surface (approximately 17m ***AHD***) in the most eastern corner of the Premises. The Perth Groundwater Atlas indicates that regional groundwater flow is in a westerly direction across the Premises. Thirteen bores are located within 500m radius of the premises boundary identified using the Water Information System (WIN) – Groundwater Sites geographical information system (***GIS***) layer. • Eleven bores are located north and north-east and east of the premises. These bores are listed as domestic/household or livestock purpose with "no current owner". • Two bores are located south of the premises. One, located 460m south of the premises, is a production bore owned by the Western Australian Fire Brigades Board and the other, located 390m south-southwest, is a livestock / domestic/household with "no current owner". The Premises is located within the groundwater area proclaimed under the *Rights in Water and Irrigation Act 1914* (***RIWI Act***)	DoW's Perth Groundwater Atlas indicates that the groundwater in the area is 1,000 – 1,500***mg/L*** which is considered brackish. Groundwater has beneficial use for industrial and bore water uses.

6.5 Soil type

The majority of the premises has existing sealed pavement with an enclosed shed; however, soil type in the general area is categorized by sandy dunes with intervening sandy and clayey swamp flats with chief soils being leached sands.

6.6 Meteorology

6.6.1 Wind direction and strength

The Bureau of Meteorology provides the following wind roses, shown in **Figure 1**, for wind direction versus wind speed (9am and 3pm – 1944 to 2016) for the Perth Airport.

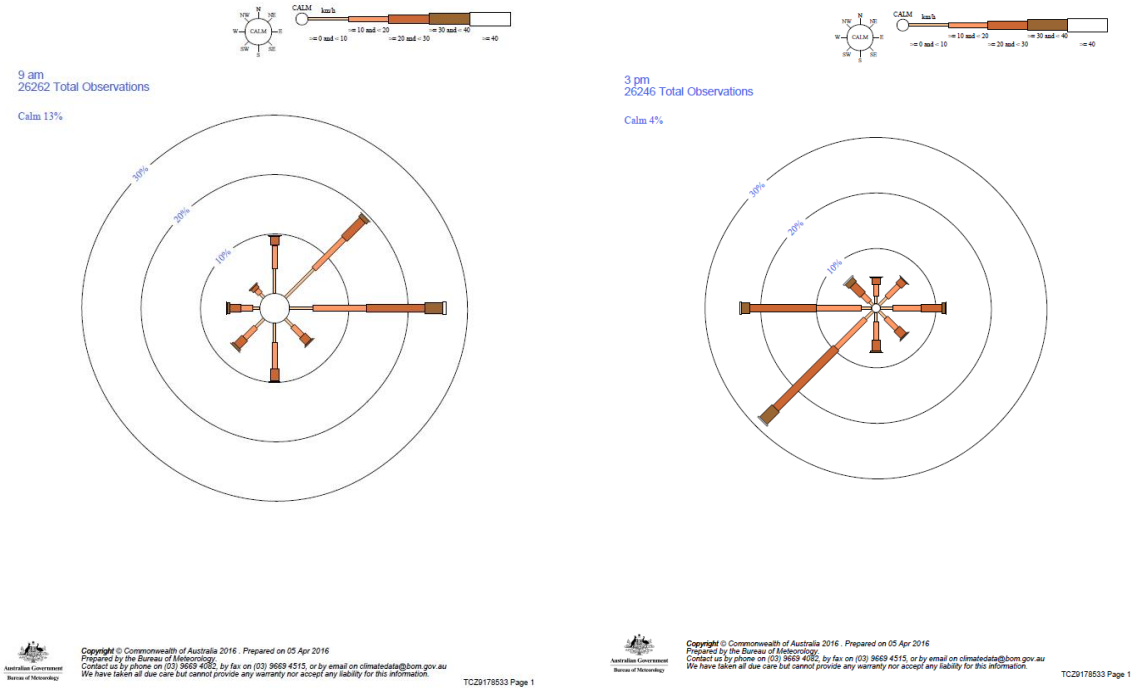

Figure 1: Wind Rose, Perth Airport based on 1944 – 2016 annual average

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

6.6.2 Regional climatic aspects

Perth has a Mediterranean climate with mild winters and hot, dry summers. The warm summer days are cooled down in the afternoon with the “Fremantle Doctor”, a strong sea breeze that blows from the ocean. This wind blows away the hot air trapped above the Perth Metropolitan Area and the Darling Ranges.

The average yearly evaporation is approximately 1,900mm with average monthly evaporation exceeding average monthly rainfall from September to April.

6.6.3 Rainfall and temperature

The Bureau of Meteorology provides the mean rainfall and maximum temperature, shown in Figure 2 below, for the Perth Airport (1944 to 2016).

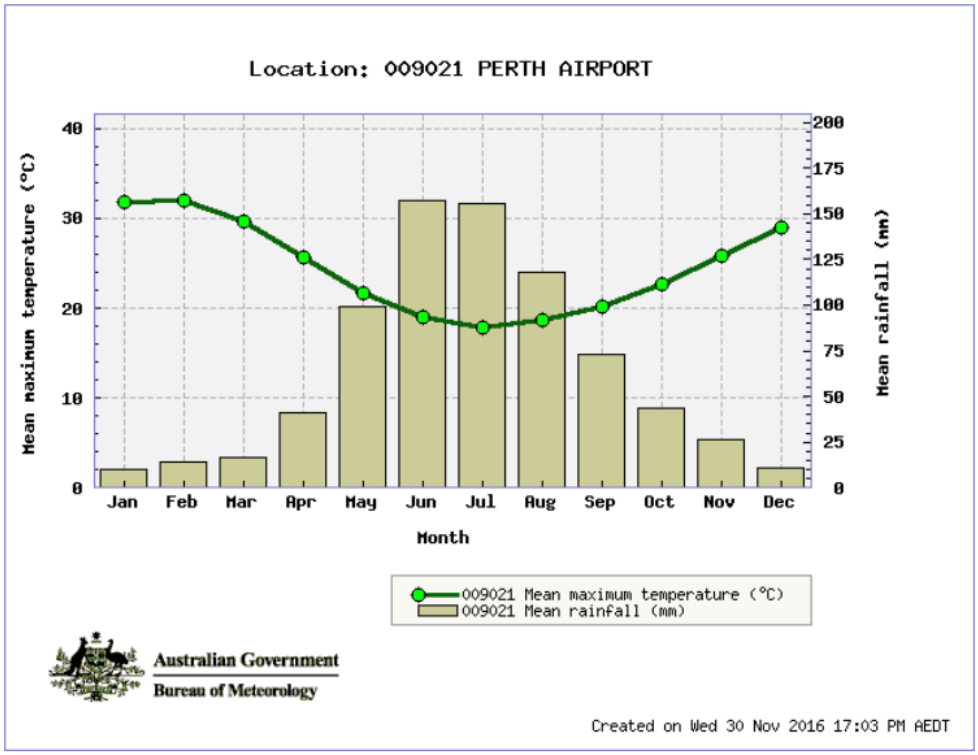

Figure 2: Mean rainfall and maximum temperature for Perth Airport (1944 to 2016)

7. Risk assessment

7.1 Confirmation of potential impacts

Identification of key potential emissions, pathways, receptors and confirmation of potential impacts are set out in Table 6 and Table 7 below.

Table 6 and Table 7 also identify which potential emissions will be progressed to a full risk assessment. Some potential emissions/impacts may not receive a full risk assessment where a potential receptor or pathway cannot be identified or where the emission/impacts are regulated under a Ministerial Statement.

Table 6: Identification of key emissions during construction

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
Source (see Section 8 for infrastructure references)	**Transport, delivery and construction / positioning of infrastructure**	Vehicle movements and installation of infrastructure	Noise	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Air / wind dispersion	Potential amenity impacts	No	The Delegated Officer considers that the separation distance between the source and potential receptors is sufficient and the activity will be carried out in an established industrial area. The EP Noise Regulations apply to noise emissions.

Table 7: Identification of key emissions during operation

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
Source (see Section 8 for infrastructure references)	**Delivery and storage of raw materials**	Vehicle movements	Noise	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Air / wind dispersion	Potential amenity impacts	No	The Delegated Officer considers that the separation distance between the source and potential receptors is sufficient and the activity will be carried out in an established industrial area. The EP Noise Regulations apply to noise emissions.
		Delivery and storage of cement and silica fume in silos	Dust	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.		Potential amenity and health impacts	Yes	See section 7.5 and 7.6
		Delivery and storage of aggregates and sand in storage bins	Dust					See section 7.5
		Delivery and storage of admixtures in tanks	Leaks, spills, overflows, containment failures	Crumpet Creek located 300m south of the premises (see section 6.4)	Direct discharge to land	Surface water pollution	No	The Delegated Officer considers that the separation distance between the source and the receptors is sufficient. The EP Unauthorised Discharges Regulations apply.

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
				Groundwater beneath the Premises ranging from 9.5mbgl to 11.5mbgl (see section 6.4)	Infiltration to groundwater	Groundwater pollution	Yes	See section 7.7
	Concrete batching	Transfer of raw materials and batching of concrete	Noise	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Air / wind dispersion	Potential amenity impacts	Yes	See section 7.4
			Dust			Potential amenity and health impacts	Yes	See section 7.5
		Management of wastewater and stormwater from the concrete batching area and raw materials storage area.	Leaks, spills, overflows, containment failure Contaminated and potentially contaminated stormwater	Crumpet Creek located 300m south of the premises (see section 6.4)	Direct discharge to land or surface water	Surface water pollution from sediments and alkaline wastewater	No	The Delegated Officer considers that the separation distance between the source and the receptors is sufficient. The EP Unauthorised Discharges Regulations apply.
				Groundwater beneath the Premises ranging from 9.5mbgl to 11.5mbgl (see section 6.4)	Infiltration to groundwater	Groundwater pollution with sediments and alkaline wastewater	Yes	See section 7.7
	Cement	Pouring and	Vibration	Closest residential	Air / wind	Potential amenity	Yes	See section 7.4

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
	Product Manufacturing **Cement Product Manufacturing**	compaction of concrete in moulds	Noise	premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	dispersion	impacts		
		Drying of moulds including operation of steam boiler	Noise	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Air / wind dispersion	Potential amenity impacts	Yes	See section 7.4
		Transport of segments offsite via road trains.	Noise	Closest residential premises located 670m ESE from the premises boundary. Commercial/industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Air / wind dispersion	Potential amenity impacts	No	The Delegated Officer considers that the separation distance between the source and potential receptors is sufficient and the activity will be carried out in an established industrial area. The EP Noise Regulations apply to noise emissions.

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
		Management of wastewater from the boiler, cleaning of moulds and secondary curing area.	Potentially contaminated wastewater due to leaks, spills, overflows, containment failure	Crumpet Creek (see section 6.4)	Direct discharge to land or surface water	Surface water pollution	No	The Delegated Officer considers that the separation distance between the source and the receptors is sufficient. The EP Unauthorised Discharges Regulations apply.
				Groundwater beneath the Premises ranging from 9.5mbgl to 11.5mbgl (see section 6.4)	Infiltration to groundwater	Groundwater pollution	Yes	See section 7.7

7.2 Risk Criteria

During the assessment the risk criteria in Table 8 below will be applied to determine a risk rating set out in this section 7.

Table 8: Risk Criteria

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

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the risk / opportunity occurring.		**The following criteria has been used to determine the consequences of a risk 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	• **on-site impacts**: catastrophic • **off-site impacts local scale**: high level or above • **off-site 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	• 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	• **on-site impacts**: high level • **off-site impacts local scale**: mid level • **off-site 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	• **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	• **on-site impacts**: mid level • **off-site impacts local scale**: low level • **off-site impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **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	• **on-site impacts**: low level • **off-site impacts local scale**: minimal • **off-site impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• 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	• **on-site impact**: minimal • Specific Consequence Criteria (for environment) met	• **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, DER may have regard to the Department of Health's, *Health Risk Assessment (Scoping) Guidelines* **"on-site"** means within the prescribed premises boundary.

7.3 Risk Treatment

DER will treat risks in accordance with the Risk Treatment Matrix in Table 9 below:

Table 9: Risk Treatment

Risk Rating	Acceptability	Treatment
Extreme	Unacceptable.	Risk event will not be tolerated. DER may refuse application.
High	Acceptable subject to multiple regulatory controls	Risk event will 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.

The emission types have been identified with the pathways and receptors in Table 7 above.

7.4 Risk Assessment – Noise and Vibration Emissions

7.4.1 General hazard characterisation and impact

Operation

Noise will be generated from normal operations onsite including noise from transfer of raw materials and batching of concrete, pouring and compaction of concrete in moulds and operation of the steam boiler. The facility is expected to operate twenty four hours a day, seven days a week. Vibration will be generated from normal operations from compaction of concrete in the moulds.

Noise and vibration impacts may result in reduced amenity and comfort of neighbouring commercial/industrial premises located immediately adjacent to the Premises.

7.4.2 Criteria for assessment

The current applicable criteria for noise emission levels are detailed in the Noise Regulations.

The Applicant engaged WSP l Parsons Brinckerhoff to undertake an environmental noise and vibration assessment of the proposed facility. The assessment has used the Noise Regulations and *AS2670.2 – 1990 Evaluation of Human Exposure to whole body vibration Part 2 Continuous and shock induced vibrations in buildin*gs as criteria for assessment.

DER Noise Branch has reviewed WSP l Parsons Brinckerhoff's environmental noise and vibration assessment report and found the modelling to be appropriate; with noise from the proposed facility expected to be readily managed to comply with the Noise Regulations.

7.4.3 Applicant controls

Applicant controls are set out in

Table 10.

Table 10: Applicant controls for noise emissions

Site Infrastructure	Description
Infrastructure	Pouring and compaction of segment moulds will occur within an existing shed.
Management	All equipment will be regularly maintained and, or replaced as necessary. Refilling of silos and fuel tanks will be undertaken during the day where possible. No engine braking in built up areas. 10km speed limits within the prescribed premises.
Noise and Vibration assessment	The noise and vibration assessment modelled sound pressure levels at the worst affected receivers compared against daytime and night time criteria. Modelling showed that the premises is expected to be compliant with the Noise Regulations during both daytime and night time operations. The assessment considered that there is a low probability of vibration impacts on nearby industrial receptors due to the distance between the expected vibration sources and the neighbouring receptor, use and construction (industrial heavy) of the building.

7.4.4 Key findings

The Delegated Officer has reviewed the information regarding the noise impacts from the premises and has found:

1. Noise assessment modelling provided by the Applicant shows that operation of the premises is expected to comply with the Noise Regulations during both day and night time operations.
2. Pouring and compaction of the segment moulds will occur within an existing shed with the premises located within an industrial area.

7.4.5 Consequence

Based upon the premises being located in an industrial area, the Delegated Officer has determined that the impact of noise emissions will have a low level impact to amenity. Therefore, the Delegated Officer considers the consequence to be **Minor**.

7.4.6 Likelihood of consequence

Based upon noise assessment modelling indicating that the premises will comply with the Noise Regulations during normal operations, the Delegated Officer has determined that the likelihood of impacts from noise emissions may only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood to be **Rare**.

7.4.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of noise emissions on neighbouring commercial/industrial premises during operation is **Low**.

7.5 Risk Assessment - Dust Emissions – Normal Operations

7.5.1 General hazard characterisation and impact

Operation

Dust may be generated from normal operations onsite including, storage of cement and silica fume in silos, storage of aggregates and sand in storage bins, transfer of raw materials and the batching of concrete.

Potential impacts from dust emissions include increased degradation of local air quality. Nuisance, health and amenity impacts on commercial and industrial receptors located immediately adjacent to the Premises boundary.

7.5.2 Criteria for assessment

Regulations 3 to 10 of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* refer to the management of dust emissions from concrete batching or cement product manufacturing activities. Additionally, general provisions of the EP Act make it an offence to cause or allow pollution. National Environmental Protection (Ambient Air Quality) Measure (***NEPM***) 2003 recommends that PM_{10} does not exceed 50***µg/m³*** over a 24 hour averaging period. Ambient monitoring at receptors has not, however, been undertaken.

7.5.3 Applicant controls

The Applicant has included a Dust Management Plan with their application which will be implemented by Boral, the concrete batching plant operator. The Applicant's controls to reduce and manage dust emissions detailed in the application and Dust Management Plan are set out in Table 11.

Table 11: Applicant controls for dust

Control	Description
Infrastructure	Cement and silica fume will be stored within fully enclosed silos fitted with dust filtration systems, relief pressure valves and level indicators with sirens that comply with Australian Standards and will be checked and cleaned regularly. In particular: - The cement and silica fume silos will be fitted with a silotop dust filter with 24m^2 cartridge filter and the outlet is vented to within 1m of the ground; - Emissions from the cartridge filters are expected to be less than 50 mg/m^3. Cement and silica fume will be conveyed from storage silos to the mixing unit via a fully sealed transfer system (screw conveyor). Sand and aggregates will be stored in roofed and shielded feed hoppers. Contingency sand and aggregate supplies will be stored in three sided ground bins fitted with water sprays. Sand and aggregates from the hoppers will be conveyed to the batching plant by a conveyor system fitted with windshields. Raw materials will be mixed in a fully enclosed wet process orbital mixing unit.
Management	Cement will be delivered to site via enclosed tankers. The cement will be unloaded directly into the silos using a flexible transfer hose fitted with a clamp. Load covers will be fitted to all sand and aggregates delivery vehicles. Regular cleaning of the batching plant compound area will be undertaken to remove any accumulated material residues and to suppress dust. Trafficable areas will be kept clean and free from loose materials likely to become windblown.

	Sprinklers will be used to keep trafficable areas damp. Daily and weekly plant inspections will be undertaken to ensure control measures remain effective and dust emissions are minimised. Filters will be replaced as part of the six monthly maintenance schedule. Spare filters will be maintained onsite in case of filter failure.

7.5.4 Key findings

The Delegated Officer has reviewed the information regarding dust impacts from the premises during normal operation and has found:

1. Raw materials will be stored within enclosed or semi – enclosed infrastructure suitable to prevent dust emissions. Cement and silica fume will be stored within enclosed silos fitted with dust filtration systems, relief pressure valves and level indicators.
2. Raw material transfers in the batching plant will be enclosed or semi-enclosed to prevent dust emissions. Applicant infrastructure and management controls are suitable to minimise the risk of dust emissions and may be conditioned as regulatory controls in the works approval subject to the risk assessment outcomes.

7.5.5 Consequence

The Delegated Officer has had regard to the nature and scale of potential dust emission activities onsite and has determined that the low level impacts to nearby industrial receptors amenity may be experienced. Therefore, the Delegated Officer considers the consequence to be **Minor.**

7.5.6 Likelihood of consequence

Based upon the Applicant's proposed controls, the Delegated Officer has determined that the likelihood of impacts from dust emissions will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely.**

7.5.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of dust emissions on neighbouring commercial/industrial premises during operation is **Medium.**

7.6 Risk Assessment - Dust Emissions – Abnormal Operations

7.6.1 General hazard characterisation and impact

Operation

Dust may be generated from abnormal operations onsite from the failure of dust control or overflow equipment on the cement and silica fume storage silos.

Potential impacts from dust emissions include increased degradation of local air quality. Nuisance, health and amenity impacts on commercial and industrial receptors located immediately adjacent to the Premises boundary.

7.6.2 Criteria for assessment

Regulations 3 to 10 of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* refer to the management of dust emissions from concrete

batching or cement product manufacturing activities. Additionally, general provisions of the EP Act make it an offence to cause or allow pollution.

7.6.3 Applicant controls

The Applicant's controls to reduce and manage dust emissions are set out in Table 12.

Table 12: Applicant controls for dust from the cement and silica fume silos

Control	Description
Infrastructure	Cement and silica fume will be stored within fully enclosed silos fitted with dust filtration systems, relief pressure valves and level indicators with sirens that comply with Australian Standards and will be checked and cleaned regularly. In particular: - The cement and silica fume silos will be fitted with a silotop dust filter with 24m^2 cartridge filter and the outlet is vented to within 1m of the ground; - Emissions from the cartridge filters are expected to be less than 50 mg/m$^{3;}$; - The silos are fitted with anti-overflow protection devices, including warning lights, audible alarms, automatic high level switches and fill pipe shutoff to prevent overfilling of the silo. Overflow protection systems are tested prior to filling operations and as part of weekly inspection and maintenance checks.
Management	Cement will be delivered to site via enclosed tankers. The cement will be unloaded directly into the silos using a flexible transfer hose fitted with a clamp. Daily and weekly plant inspections will be undertaken to ensure control measures remain effective and dust emissions are minimised. Filters will be replaced as part of the six monthly maintenance schedules. Spare filters will be maintained onsite in case of filter failure.

7.6.4 Key findings

The Delegated Officer has reviewed the information regarding dust impacts from the premises during abnormal operation and has found:

1. Cement and silica fume will be stored within enclosed silos fitted with dust filtration systems, relief pressure valves and level indicators. These silos are fitted with anti-overflow protection devices.
2. Applicant infrastructure and management controls are suitable to minimise the risk of dust emissions and may be conditioned as regulatory controls in the works approval subject to the risk assessment outcomes.

7.6.5 Consequence

Based upon the premises being located in an industrial area, the Delegated Officer has determined that the impact of dust emissions during abnormal operations will have a mid-level impact to amenity on a local scale. Therefore, the Delegated Officer considers the consequence to be **Moderate.**

7.6.6 Likelihood of consequence

Based upon the Applicant's proposed controls and management measures, the Delegated Officer has determined that the likelihood of impacts from dust emissions from abnormal operations may only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood to be **Possible.**

7.6.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of dust emissions during abnormal operations on neighbouring commercial/industrial premises during operation is **Medium**.

7.7 Risk Assessment – Management of wastewater, potentially contaminated stormwater, leaks, spills overflows and containment failure

7.7.1 General hazard characterisation and impact

Operation

Wastewater is generated from the concrete batching, boiler, cleaning of moulds and secondary curing area. Potentially contaminated stormwater is generated from the concrete batching area and raw materials storage area. There is also potential for leaks, spills, overflows or containment failure of the admixture tanks.

Potential impacts include sediments and alkaline wastewater potentially polluting groundwater.

7.7.2 Criteria for assessment

Regulations 11 and 12 of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* refer to the management of wastewater and potentially contaminated stormwater from concrete batching or cement product manufacturing activities. Additionally, general provisions of the EP Act make it an offence to cause or allow pollution.

7.7.3 Applicant controls

The Applicant's controls to reduce and manage wastewater, potentially contaminated stormwater, leaks, spills, overflows or containment failure are set out in Table 13.

Table 13: Applicant controls for wastewater and potentially contaminated stormwater

Control	Description
Raw materials storage area	
Infrastructure	Stormwater from the raw materials storage area will be captured by existing soak wells. Excess stormwater is conveyed via pipe network to the main infiltration pond located at the southwest end of the premises. Inlet protection / silt traps will be installed if deemed necessary to filter water prior to entering the soak wells.
Concrete batching area including slurry and settlement pits and boiler	
Infrastructure	The slurry pit is designed to capture the initial 10mm of rainfall, and once full, stormwater is then diverted (via gravity flow due to the slurry pit being full) through an outlet at least 1m from the slurry pit to the infiltration drain along the northwest boundary of the premsies. A float valve will be installed to activate the chemical dosing unit (***CDU***) pump when the water level in the slurry pit reaches the maximum production water height (5kL). Potentially contaminated stormwater from the concrete batching area is directed

	(via kerbing and speed bumps) to the slurry pit. Wastewater from the concrete batching operations is directed to one of two above ground settlement pits. Each of these settlement pits drains to the slurry pit. Two, 10,000L bunded admixture storage tanks
Management	Waste and concrete washout from the concrete batching operations is deposited into one of the above ground settlement pits which then drains into the slurry pit (below ground pit). Settlement pit holes (that drain to the slurry pit) will be plugged/capped to stop water flow until settlement has occurred. Some of the plugs will then be released to allow settled wastewater to flow into the slurry pit. Wastewater is pumped from the slurry pit to the CDU to be treated. The treated water is then gravity fed to the infiltration drain; or, if required, disposed of via a registered waste disposal company.
Cleaning of moulds	
Infrastructure	Two sumps, one at each end of the carousel, will capture any washdown water from the cleaning of the segment moulds.
Management	Wastewater from the sumps in the carousel area will be pumped to the slurry pit and treated by the CDU.
Secondary curing area	
Infrastructure	A sump will capture any wastewater from the secondary curing area.
Management	Wastewater from the sump in the secondary curing area will be pH tested. If required, wastewater will be pumped to the slurry pit and treated by the CDU. Otherwise, the wastewater is pumped back into the water storage tank and reused in the sprinkler system.

7.7.4 Key findings

The Delegated Officer has reviewed the information regarding wastewater and potentially contaminated stormwater impacts from the premises and has found:

1. Depth to groundwater at the site is 9.5 – 11.5mbgl with chief soils being leached sands.
2. Potentially contaminated stormwater from the raw materials storage area will be captured in soak wells with overflow being directed to an infiltration drain.
3. Potentially contaminated stormwater and wastewater will be captured and directed to a settlement or slurry pit for treatment and reuse or discharged to the infiltration drain.

7.7.5 Consequence

Based upon potentially contaminated stormwater being directed to soak wells, the design of the settlement and slurry pits potentially allowing untreated and unsettled wastewater to be discharged to the infiltration drain, and the depth to groundwater at the premises, the Delegated Officer has determined that the impact of wastewater and potentially contaminated stormwater on groundwater will be minor at a local scale. Therefore, the Delegated Officer

considers the consequence to be **Minor.**

7.7.6 Likelihood of consequence

Based upon the design of the slurry pit and depth to groundwater being 9.5 – 11.5m at the premises, the Delegated Officer has determined that the likelihood of impacts from contaminated wastewater and potentially contaminated stormwater on groundwater could occur at some time. Therefore, the Delegated Officer considers the likelihood to be **Possible.**

7.7.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of wastewater and potentially contaminated stormwater impacting on groundwater during operation is **Medium.**

7.8 Summary of risk assessment and acceptability

A summary of the risk assessment and the acceptability of the risks with treatments are set out in Table 14 below. Controls are described further in section 8.

Table 14: Risk assessment summary

	Emission		**Pathway and Receptor**	**Applicant controls**	**Impact**	**Risk Rating**	**Acceptability with treatment (conditions on instrument)**
	Type	**Source**					
1.	Noise	Transfer of raw materials Batching of concrete Pouring and compaction of concrete in moulds Operation of the steam boiler	Air/Wind dispersion: Closest residential premises located 670m ESE from the premises boundary. Commercial / industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.	Management controls	Reduction in amenity	Minor consequence Rare **Low risk**	Acceptable, subject to applicant controls conditioned
2.	Dust	Storage of cement and silica fume in silos Storage of sand and aggregates in storage bins Transfer of	Air/Wind dispersion: Closest residential premises located 670m ESE from the premises boundary.	Infrastructure and Management (enclosed silos, water sprays, regular inspections and maintenance)	Potential adverse health effects and reduction in amenity	**Normal operations:** Minor consequence Unlikely **Medium risk** **Abnormal**	Acceptable, generally subject to regulatory controls.

	Emission		Pathway and Receptor	Applicant controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	**Source**					
		raw materials Batching of concrete	Commercial / industrial properties located immediately adjacent to the Premises with closest neighbouring buildings located approximately 35m northwest of the Premises boundary.			**operations:** Moderate consequence Possible **Medium risk**	
3	Wastewater, potentially contaminated stormwater and leaks, spills, overflows or containment failures	Admixture tanks Concrete batching Boiler Cleaning of moulds and secondary curing area Raw materials storage area	Direct seepage to groundwater beneath the premises	Infrastructure (speed bumps, kerbing, settlement and slurry pits) Management ((chemical dosing unit, sumps, inspections and maintenance)	Sediments and alkaline wastewater impacting on groundwater quality	Moderate consequence Possible **Medium risk**	Acceptable, generally subject to regulatory controls.

8. Determined Regulatory Controls

A summary of the risks with corresponding controls are set out in Table 15. The risks are set out in the assessment in section 7 and the controls are detailed in this section 8. Controls will form the basis of conditions in the works approval set out in Attachment 1.

Table 15: Summary of regulatory controls to be applied

		Controls (references are to sections below setting out details of controls)
		8.1 Infrastructure and Equipment
Risk Items (see risk analysis in section 7)	1. Noise	•
	2. Dust	•
	3. Wastewater, potentially contaminated stormwater and leaks, spills, overflows or containment failures	•

8.1 Works Approval controls

8.1.1 Noise management infrastructure

The following infrastructure should be maintained onsite for noise emissions management. The requirements in Table 16 are derived from applicant controls as described in section 7.4.

Table 16: Noise infrastructure requirements

Infrastructure	Requirements (design and construction)
General	Existing shed for the pouring and compaction of segment moulds.

Grounds: The approved infrastructure will suitably minimise the risk of noise emissions. Additionally, noise emissions are regulated by the EP Noise Regulations.

8.1.2 Dust management infrastructure and equipment

The following infrastructure and equipment should be maintained and operated onsite for dust emissions management. The requirements in Table 17 are derived from applicant controls as described in sections 7.5 and 7.6:

Table 17: Dust infrastructure requirements

Infrastructure	Requirements (design and construction)
Concrete Batching and Raw Materials Storage areas	- Three, cement and silica fume fully enclosed 100 tonne storage silos fitted with dust filtration systems, relief pressure valves and level indicators with sirens that comply with Australian Standards. In particular: • The cement and silica fume silos will be fitted with a silotop dust filter with 24m^2 cartridge filter and the outlet is vented to within 1m of the ground; and • The silos are fitted with anti-overflow protection devices, including warning lights, audible alarms, automatic high level switches and fill

	pipe shutoff. - Fully sealed system for the transfer of cement and silica fume from the storage silos to the batching plant. - Five, 40m^3 roofed and shielded sand and aggregate holding/feed hoppers. - Five, 200-300m^3 three sided sand and aggregate ground storage bins fitted with water sprayers. - Conveyor system fitted with windshields for the transfer of sand and aggregates from the holding/feed hoppers to the batching plant. - Raw materials to be mixed in a fully enclosed wet process orbital batching plant.

Grounds: The approved infrastructure and equipment will suitably minimise the risk of dust emissions entering the environment. Additionally, regulations 3 to 10 of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* refer to the management of dust emissions from concrete batching or cement product manufacturing activities that includes, in summary, the following:

- no visible dust escapes the premises boundary;
- immediate clean up of any material spilt;
- trafficable areas to be sealed or managed to minimise dust;
- all sand and aggregates to be stored to minimise dust (stockpiles covered or kept damp, or height of sand or aggregates in storage bins not to exceed wall heights);
- cement to be stored in bags or silos;
- silos to be fitted with air cleaning system and a level indicator or relief valve;
- all raw material transfer areas (including hoppers, conveyors and transfer points) are to be enclosed, fitted with windshields, water sprays or dust extraction system (or otherwise designed and operated) to prevent the escape of visible dust; and
- cement product manufacturing areas must be regularly cleaned to prevent accumulation of dust on any surface.

8.1.3 Wastewater, potentially contaminated stormwater, leaks, spills, overflows and containment failure

The following environmental controls, infrastructure and equipment should be maintained and operated onsite for wastewater, stormwater, leaks, spills, overflow and containment failure management:

Table 18: Wastewater and Stormwater infrastructure requirements

Infrastructure	Requirements (design and construction)
Raw materials storage area	- Soak wells to capture clean and potentially contaminated stormwater. - Pipe network to direct excess stormwater to the main infiltration pond.
Concrete batching area	- Two 10,000L bunded admixture storage tanks. - 20kL slurry pit designed to capture the initial 10mm of rainfall. - Float valve on the slurry pit designed to activate the CDU pump when water level in the slurry pit reaches the maximum production water height (5kL) - Kerbing and speed bumps to direct potentially contaminated stormwater

	from the concrete batching area to the slurry pit. - Two 4m x 4m x 1m (12m^3 capacity) settlement pits designed to contain wastewater from the concrete batching operations, which then allow settled wastewater to flow into the slurry pit.
Segment carousel	- Two sumps, one at each end of the carousel to capture any washdown water from the cleaning of segment moulds.
Secondary curing area	- Sump to capture any wastewater from the secondary curing area.

Grounds: The approved infrastructure will suitably minimise the risk of wastewater, potentially contaminated stormwater or chemicals (from leaks, spills, overflows or containment failure) entering the environment. Regulations 11 and 12 of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998* refer to the management of wastewater and potentially contaminated stormwater from concrete batching or cement product manufacturing activities. that includes, in summary, the following:

- all wastewater and potentially contaminated stormwater from concrete batching or areas likely to contain waste material drains into a slurry pit or settling pond;
- no water used in concrete batching or cement product manufacturing is discharged from the premises until it has been through a silt trap or contained in a settling pond long enough to allow particulate matter to settle out;
- settled material in a slurry pit is not be dried out (except to allow settled material to be removed) or be higher than 30cm below the top of the slurry pit walls; and
- slurry pits, settling ponds, silt traps and oil interceptors are to be maintained to ensure their efficient operation.

Additionally, it is an offence to discharge sediment or an alkali (with a pH more than 10) into the environment under regulation 3 of the EP Unauthorised Discharges Regulations.

9. Appropriateness of Works Approval conditions

The conditions in the Issued Works Approval in Attachment 1 have been determined in accordance with DER's *Guidance Statement on Setting Conditions*.

Condition Ref	Grounds
Environmental Compliance Condition 1	Environmental compliance is a valid, risk-based condition to ensure appropriate linkage between the works approval and the EP Act.
Premises Conditions 2 and 3	These conditions are valid, risk-based and consistent with the EP Act.
Location of works Condition 4	This condition is valid, risk-based and consistent with the EP Act.
Infrastructure and Equipment Conditions 5, 6, 7 and 8	These conditions are valid, risk-based and contain appropriate controls (see section 8).
Records and Information Conditions 9 and 10	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.
Reports Conditions 11 and 12	
Requests for information Condition 13	

DER notes that it may review the appropriateness and adequacy of controls at any time, and

that following a review, DER may initiate amendments to the works approval under the EP Act.

10. Applicant's comments

The applicant was provided with the draft ***decision report*** and draft works approval on 17 January 2017. The Applicant provided comments on 23 January 2017. These are summarized in Appendix 2.

11. 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 Issued Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Caron Goodbourn

A/Manager Licensing – Industry Regulation (Process Industries)
An officer delegated under section 20 of the Environmental Protection Act 1986

Appendix 1: Key Documents

	Document Title	In text ref	Availability
1	Application for Works Approval		DER records A1185314
2	Forrestfield Airport Link Carolyn Way Precast Facility Water Management Plan		DER records (A1340440)
3	FAL CPP – Response to Department of Environment Regulation Information Request		DER records (A1343773)
4	FAL CPP – Response to Department of Environment Regulation Information Request		DER records (A1345157)
5	FAL CPP – Response to Department of Environment Regulation Information Request		DER records (A1349564)
6	FAL CPP – Response to Department of Environment Regulation Information Request		DER records (A1356310)
7	DER Noise Regulation Branch technical review		DER records (A1355194)
8	Ministerial Statement 1022	MS 1022	Accessed at www.epa.wa.gov.au
9	Perth Groundwater Atlas		Accessed at http://atlases.water.wa.gov.au/idelve/gwa
10	DER *Guidance Statement on Regulatory Principles,* July 2015		Accessed at www.der.wa.gov.au
11	DER *Guidance Statement on Decision Making,* November 2016		
12	DER *Guidance Statement on Risk Assessment,* November 2016		
13	DER *Guidance Statement on Setting conditions,* October 2015		

Appendix 2: Summary of Applicant's Comments on Risk Assessment and Draft Conditions

Comments received	Environmental risk	DER consideration of risk:
Salini Impregilo Ernie Stead-Richardson, 24/01/2017. The Decision Report incorrectly stated the number of operating days for the Premises and included reference to a Guidance Statement which has been redacted by DER.	None	The Decision Report was updated to correct the minor errors.
Salini Impregilo Ernie Stead-Richardson, 24/01/2017. The Applicant's construction drawings do not contain some of the technical details specified in Table 2 of the draft works approval and therefore wouldn't address all requirements of a proposed condition requiring certification of construction plans prior to commencing works.	ne	The proposed condition requiring certification of construction plans prior to commencing works was removed from the works approval as it is not required. Suitable diagrams and plans of the premises have already been provided as part of the application.

Attachment 1: Issued Works Approval W6014/2016/1