Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8199/2007/2
Licence Holder	Chichester Metals Pty Ltd
ACN	109 264 262
File Number	DER2013/001073-2
Premises	Cloudbreak Iron Ore Mine Mining Tenements Mining Tenements M45/1126, M46/401, M46/404, M46/405, M46/356, M46/402, M46/410, M46/411, M46/357, M46/453, M45/1128, M46/449, M46/452, M46/451, M46/454, M46/450, M45/1084, M45/1140, M45/1139, M45/1102, M45/1105, M45/1124, M45/1103, M45/1106, M45/1125, M45/1104, M45/1107, M45/1082, 45/1083, M45/1127, M45/1138, M45/1263, M45/1303, M46/403, M46/406, M46/407, M46/408, M46/409, M46/412, M46/413, M46/414, L46/46, L46/47, L46/48, L46/49, L46/51, L46/52, L46/57, L46/62, L46/64, L46/96 L46/99, L46/130, L45/152 and Exploration Leases E45/2498, E46/590, E46/612, E45/2499, E45/2652, E45/2497, E45/6960 MULGA DOWNS WA 6751 As defined by Figure 1 in Schedule 1 of the Revised Licence
Date of Report	26 August 2024
Decision	Revised licence granted

Alana Kidd

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Alana Kidd
Manager, Green Energy

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L8199/2007/2 is held by Chichester Metals Pty Ltd (Chichester Metals; the licence holder) for the Cloudbreak Iron Ore Mine (the premises), located at Mulga Downs, WA. Chichester Metals is a subsidiary of Fortescue Metals Group (FMG).

This amendment report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the premises. As a result of this assessment, revised licence L8199/2007/2 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this amendment report, the department has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 10 May 2024, the licence holder submitted an application to the department to amend licence L8199/2007/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act).

The following amendments are being sought:

- increase Brampton in-pit tailings storage facility (TSF) maximum tailings elevation deposition point from the existing 423 metres reduced level (m RL) to 426.7 m RL;
- increase the maximum groundwater reinjection limit from 150 gigalitres (GL) per annum to the 175 GL per annum;
- addition of prescribed premises category 77 (concrete batching) to allow concrete batching/cement products manufacturing up to 55,000 tonnes per annum for use on projects both within and outside the prescribed premises; and
- administrative amendment to remove saline reinjection bores from condition 8, Table 5, given that construction compliance has been demonstrated for these bores (see Appendix 3 for further detail).

This amendment is limited only to addition of category 77 and changes to category 5 and 6 activities from the existing licence. No changes to other aspects of the existing licence relating to categories 52, 54, 57, 64 or 73 have been requested by the licence holder. Table 1 below outlines the proposed changes to the existing licence.

Table 1: Proposed design or throughput capacity changes

Category	Current design/ throughput capacity	Proposed design/ throughput capacity	Description of proposed amendment
5	50,000,000 tonnes per annual period	N/A	No proposed change to throughput. Amendment requested for maximum tailings deposition point within Brampton in-pit TSF.
6	Maximum of 150,000,000 tonnes per annual period (reinjected)	Maximum of 175,000,000 tonnes per annual period (reinjected)	Increase in the maximum groundwater reinjection limit.

77	New category	55,000 tonnes per annual period	Concrete batching and cement/products manufacturing up to 55,000 tonnes per annual period.

2.2.1 Category 5 activities

Chichester Metals proposes to release additional capacity within the Brampton in-pit TSF by changing the elevation of the spigot used for tailings deposition and consequently raising the maximum tailings deposition elevation from 423 m RL to 426.7 m RL. This amendment will provide approximately 8,420,213 m^3 additional storage capacity to allow tailings deposition until October 2027. Deposition modelling conducted by Fortescue (2024) indicates that, even with this change, there will be sufficient capacity to retain a 1 in 100 year storm event over 72 hours with an available freeboard of 1.9 m above the maximum operating level (MOL) (Figure 1).

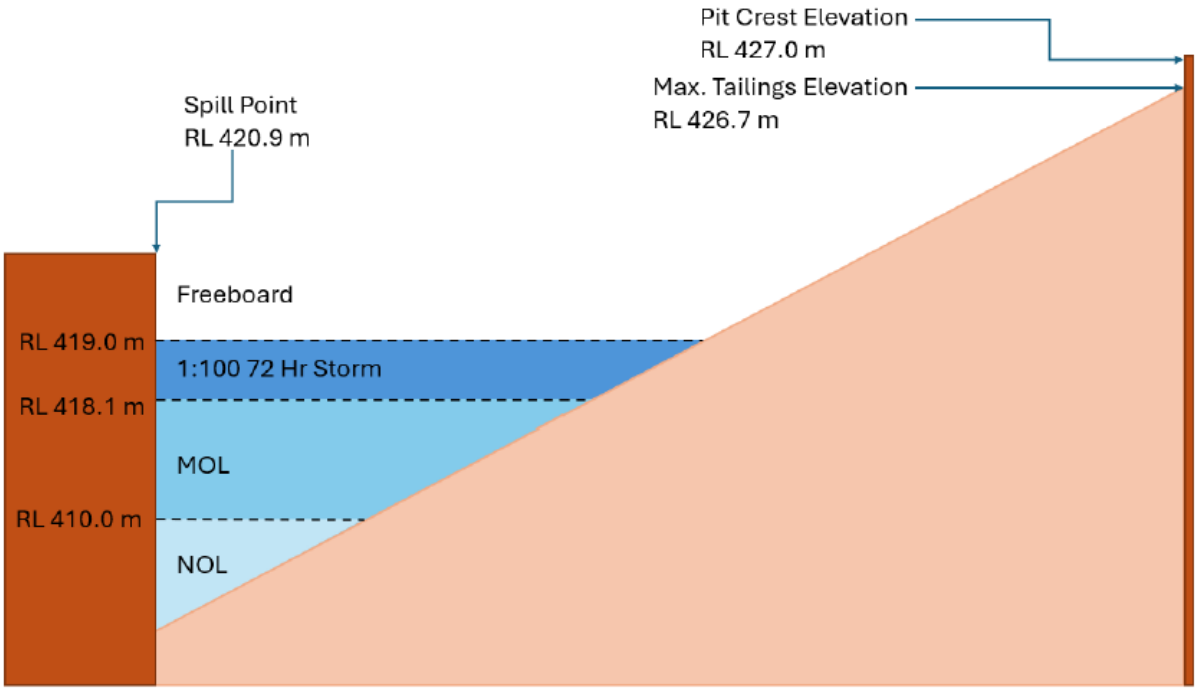


Figure 1 Tailings deposition schematic. MOL = maximum operating level, NOL = normal operating level (Fortescue, 2024a)

Deposition modelling criteria used by Fortescue (2024) are included in Table 8, Appendix 1 and assume expected tailings densities of 1.5 tonnes per cubic metre (t/m^3) (sub-aerial) and 1.28 t/m^3 (sub-aqueous). The licence holder conducts aerial and bathymetric surveys to determine the tailings density. Sub-aerial (above water) settled tailings density is reconciled monthly using aerial survey and subaqueous (below water) bathymetric surveys are undertaken quarterly. Fortescue notes that tailings percent solids concentration at Cloudbreak are consistent and expected to increase with time. Over financial year (FY) 22, FY23 and FY24 the weighted average percent solids are 46%, 48% and 45% (to date) respectively. FY24 data to date is provided in Table 9, Appendix 1.

2.2.2 Category 6 activities

The applicant proposes to increase the annual reinjection limit by 25 GL/annum (from 150 to 175 GL/annum) to facilitate dewatering of new mining pits, and existing mining pits where a cessation of dewatering has resulted in a rebound of groundwater levels into the mine void. Increased reinjection to 175 GL has been approved under Part IV of the EP Act via a section 45C amendment to ministerial statements 899, 962 and 1010 (see section 2.3 of this report for further detail regarding Part IV approvals). Existing approved abstraction and reinjection infrastructure will be used (Figure 2).

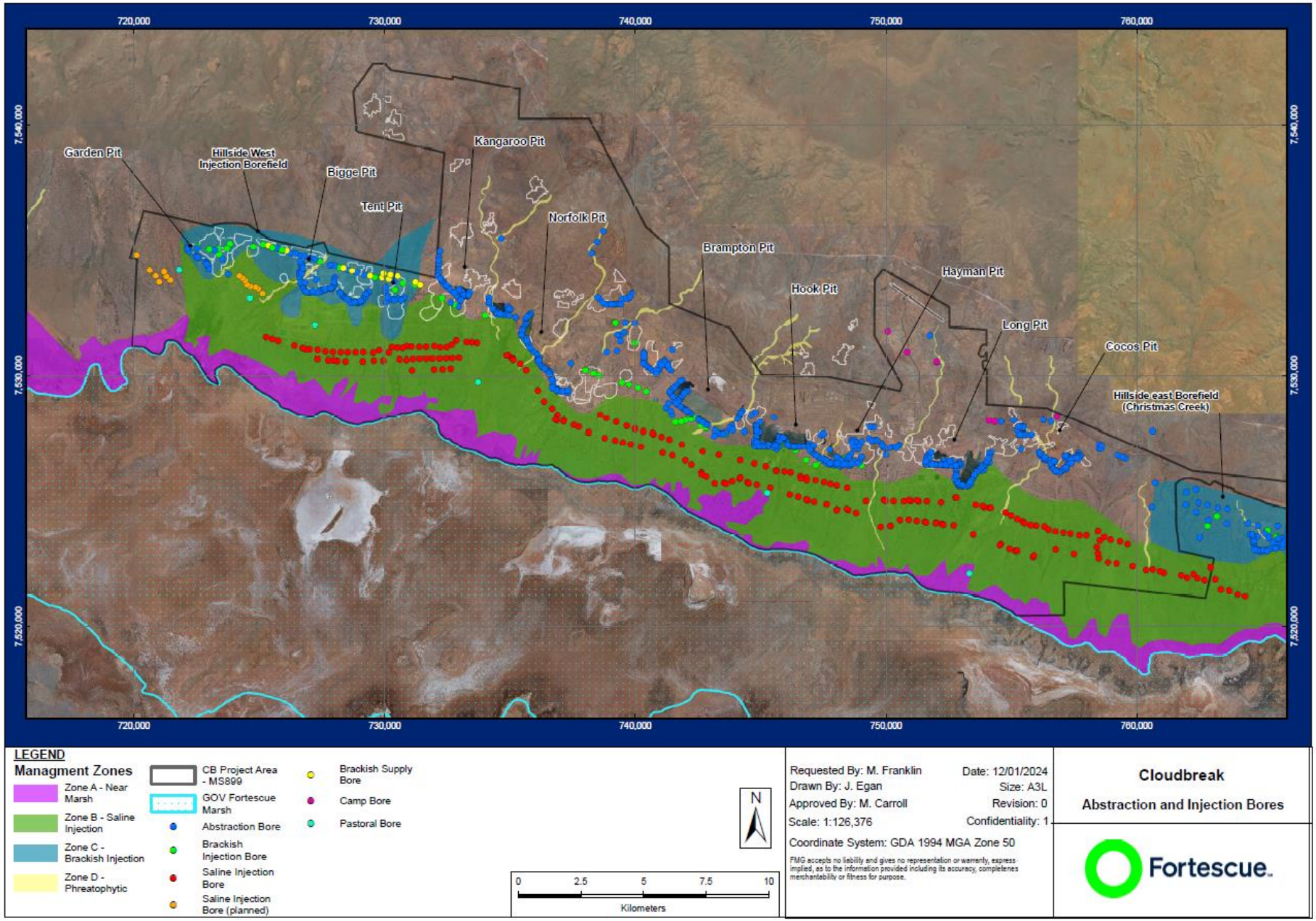


Figure 2: Cloudbreak mine abstraction and reinjection infrastructure

L8199/2007/2

L8199/2007/2 licence amendment July 2023 – additional injection infrastructure

The applicant proposes to use existing saline injection infrastructure to support the additional proposed 25 GL of reinjection into the Oakover aquifer. Installation of additional mine dewater injection bores was conditioned as part of the licence amendment in July 2023. This included an additional 48 saline injection bores to allow dewatering and mining of the Garden Pit and an additional 30 saline injection bores to support reinjection in the eastern and central Cloudbreak mining areas.

The department has confirmed construction compliance for the following 15 saline injection bores: SRP340, SRP342, SRP344, SRP348, SRP349, SPR350, SRP359, SRP319, SRP321, SRP322R, SRP323, SRP324, SRP325, SRP326, SRP327. These bores have been constructed in accordance with the requirements specified under Conditions 9 (renumbered to 8) of the licence. Fortescue indicate another seven bores will be constructed and operational from Q4 2024 and the remaining bores constructed in stages until 2025.

The department queried whether the current infrastructure was sufficient to support reinjection without pressurisation of the Oakover aquifer. Fortescue replied that abstracted and reinjected water is dynamically managed to ensure groundwater levels are maintained at the northern fringe of the Fortescue Marsh, consistent with the approval granted by the EPA through a Section 45C on 9 February 2024.

2.2.3 Category 77 activities

Fortescue proposes to amend the licence to include prescribed premises category 77 to permit concrete batching and supply of concrete to the Cloudbreak mine and outside the prescribed premises boundary to other Fortescue projects (as required). The proposed concrete batching plant (CBP) will be constructed and operated within mining tenements M45/1125, M45/1124, M46/411, M46/410 as required, and will have the capacity to produce up to 55,000 tonnes of concrete per annum. The proposed location of the CBP is shown in Figure 6, Appendix 2.

Dry materials required for concrete production will be sourced offsite with cement transported to the CBP using road tanker vessels. Aggregate and sand will be sourced from local quarries within the Pilbara region. Materials will be transported by a front-end loader (FEL) from designated storage locations to the aggregate storage areas (stockpiles). Materials will be loaded into the CBP aggregate weigh bins from the aggregate storage areas using a FEL. Dry materials will be managed to control temperature, moisture and dust levels through the application of water.

Water will be sourced from onsite groundwater bores approved under the current *Rights in Water and Irrigation (*RIWI*) Act 1914* and 5C groundwater licensing provisions and managed in accordance with the Groundwater Operating Strategy. Peak water usage is expected to be approximately 17,500 litres per hour to produce 60 cubic metres of concrete per hour.

Power will be supplied from the site's power supply and local diesel powered gensets as required. Peak power use is expected to be approximately 330 kilovolt-amperes (0.33 megawatt). Peak diesel fuel use is expected to be approximately 18 litres per hour sourced locally using road transport. Gensets will be self-bunded and enclosed. Fortescue indicates there is sufficient capacity to accommodate the CBP within the current approved peak power and fuel requirements under existing prescribed premises categories 52 (electric power generation: 50.6 megawatts) and category 73 (bulk storage of chemicals: 7,700.5 cubic metres).

Key components of the CBP infrastructure include:

- a computer-controlled batching system (CommandAlkon or similar) to record batching quantities;
- self-contained batch plant with vertical cement silo, horizontal cement silo, cement weigh

hopper and twin aggregate weigh bins;

- aggregate and sand mixtures (stockpiles) and associated sprinklers;
- wedge pit;
- chiller plant;
- wash out pit;
- generator and reticulated power;
- fuel storage; and
- batch room.

2.3 Part IV of the EP Act

Conditions for the protection of Fortescue Marsh and vegetation from dewatering and aquifer reinjection (i.e. groundwater level changes) are included within ministerial statements 899, 962 and 1010 for the Cloudbreak mine under Part IV of the EP Act (summarised in Table 2 below). The scope of this EP Act Part V assessment is limited to potential impacts associated with groundwater quality, rather than management of impacts from changes in water table levels.

Table 2: Groundwater management conditions within Cloudbreak mine ministerial statements

Ministerial statement	Condition	Detail
MS 899	6	Condition 6 was recommended by the EPA to minimise the indirect impacts from mounding, drawdown, ponding and shadowing of vegetation to ensure the indirect impacts are not greater than those predicted (as specified in condition 6-1). Condition 6-1 of MS 899 specifies: *"The proponent shall manage the proposal in a manner that ensure there is no adverse impact to conservation significant vegetation as a result of implementing this proposal, greater than:* *1. 315 hectares of Mulga vegetation;* *2. 763 hectares to Samphire vegetation; and* *3. 3 hectares to Coolibah/river Red Gum creekline vegetation, outside the Mine Envelope."* Conditions 6-2 to 6-7 required the development and implementation of a vegetation health monitoring and management plan to ensure that the requirements of 6-1 are met.
	7	Condition 7 of MS 899 was recommended by the EPA to restrict groundwater mounding and drawdown at the fringe of the Fortescue Marsh to one metre to prevent impacts to groundwater dependent vegetation.
MS 962	7-1	MS 962 amended Condition 7-1 of MS 899, specifying that: "*The proponent shall manage the injection of surplus water to ensure that groundwater levels do not rise or drop by more than one metre at the fringe and within the Fortescue Marsh, from the baseline groundwater level, using a suitable network of bores at the fringe of the Fortescue Marsh as shown in Figure 2 and delineated by co-ordinates in Schedule 2, having regard for climatic trends and seasonal variation, unless prior*

		written authorisation of the CEO has been received."
	7-2	MS 962 amended Condition 7-2 of MS 899, specifying that: *"To verify that the requirements of Condition 7-1 are being met the proponent shall, to the requirements of the CEO:* *1. undertake baseline monitoring at groundwater monitoring bores located on the fringe of the Fortescue Marsh and a control bore outside impacts areas within one month of the date of issue of this Statement for currently installed bores and as soon as is practicable for the new fringe bores and the control bore…* *2. establish trigger groundwater levels at locations identified in Condition 7-2(1) having regard for climatic trends and seasonal variation; and* *3. monitor groundwater levels monthly at a minimum at locations identified in Condition 7- 2(1)."*
MS 1010	N/A	Originally granted on 4 August 2015 to increase abstraction (100 GL per annum) and reinjection (95 GL per annum) both to 150 GL per annum. Amended on 9 February 2024 to increase in the volume of groundwater abstraction and reinjection from 150 to 175 GL per annum at the existing Cloudbreak Life of Mine proposal (described in Ministerial Statement No. 899 and amended by Statement 962).

2.4 Rights in Water and Irrigation Act 1914 (RIWI Act)

The site is located within the Pilbara Groundwater Area and the Pilbara Surface Water area which are proclaimed under the RIWI Act. The licence holder intends to apply for an increase to the existing licensed groundwater abstraction or re-injection volumes.

Fortescue holds section 5C groundwater licences (GWL)177836(4), GWL166200(13) and GWL166354(12) which allow for a combined water entitlement of 150 GL per annum. For general campsite and mine potable water supply they also hold GWL 178642(2), GWL 178644(2) and GWL 178646(2). The licence is operating in accordance with an approved Groundwater Operating Strategy (GWOS), summarised in section 2.4.1 below.

Groundwater has been abstracted at Cloudbreak to enable open pit mining below the water table mining and provide water for mining operations since 2008. Abstracted groundwater is used as a water supply in mining operations including ore processing, dust suppression, construction activities and the accommodation village. Surplus water is returned to suitable aquifers via reinjection.

2.4.1 Groundwater operating strategy

The licence holder has developed the Cloudbreak Groundwater Operating Strategy (CB-PH-HY- 0009) (GWOS) to support the EP Act Part IV and RIWI Act approvals. To provide context for the operating strategy, a summary of the site's hydrogeology is firstly given below.

Hydrogeology

Within the area of the Cloudbreak mine reinjection borefield, the primary aquifer is the Oakover formation within tertiary sediments overlying the Marra Mamba formation (MMF; which hosts the iron ore mineralisation). The Oakover formation is considered to have high transmissivity and aquifer storage due to the presence of calcrete and silcretes. It is overlain by a clay dominated sequence which acts as a confining layer between the Oakover formation and the groundwater in the overlying alluvial sequence (shallow aquifer). Pressurisation of the Oakover aquifer (from reinjection) has the potential to impact upon the overlying shallow aquifer by

transferring water vertically through the confining clay layer.

Groundwater in the resource area is generally brackish and becomes increasingly saline towards the Fortescue Marsh and with depth. Based on the water quality distribution and beneficial use considerations, two classes of groundwater quality are defined for the purpose of groundwater management:

- Brackish: <6,000 milligrams per litre (mg/L), total dissolved solids (TDS), which occurs in shallow aquifer zones within the mineralised MMF and overlying tertiary sediments located on the upper slopes of the Chichester Range; and
- Saline - hypersaline: >6,000 mg/L to 150,000 mg/L TDS, where the lower limit applies to recharge areas, with an increase in salinity within all aquifers found further south and at greater depth. The aquifer within the Oakover Formation, which overlies the MMF to the south of the resource area, is entirely of saline quality (monitored up to 150,000 mg/L).

Brackish and saline (to hypersaline) water are disposed of into separate areas as described in the sections below. A conceptual water balance for the site is shown in Figure 3 and a conceptual hydrogeological model in Figure 4 below.

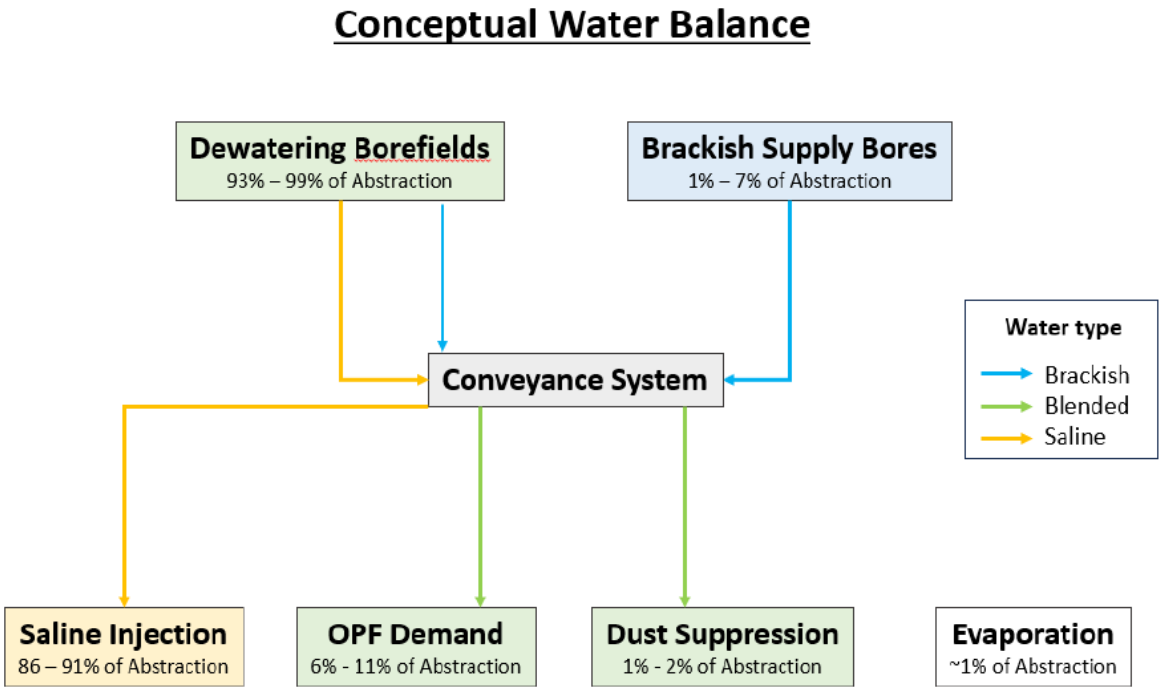


Figure 3 Abstraction / reinjection conceptual water balance

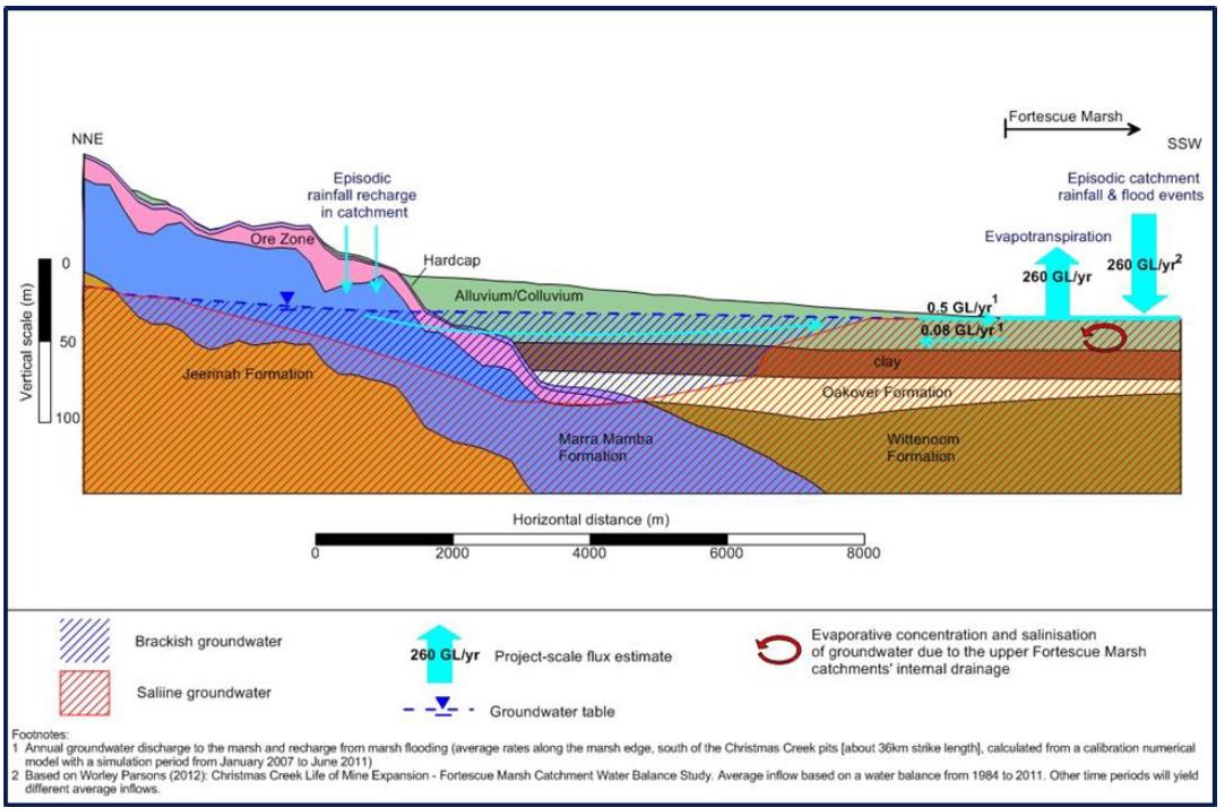


Figure 4: Cloudbreak conceptual hydrogeological cross-section

Saline water injection:

- The site operates with a saline water surplus as demand for saline water is low given it is only used for dust suppression in mining areas. Saline water is consequently reinjected into the Oakover aquifer.
- Saline injection areas, labelled “zone B”, are shown in Figure 2.
- The primary objective of groundwater management in this zone is for the injection of saline water to the Oakover aquifer to not cause mounding in the above shallow (and less saline) aquifer which in turn may impact Mulga, and other groundwater sensitive vegetation.

Brackish water injection:

- Cloudbreak mine is typically operated with a deficit of brackish water supply, with non-dewatering sources making up the brackish deficit. Occasionally there may be brackish water surplus when dewatering is initiated at new mining areas and/or when ore processing is interrupted for maintenance shutdown. Brackish water surplus is disposed primarily via reinjection.
- Brackish injection areas, labelled “zone C”, are shown in Figure 2.
- The objective of groundwater management in this zone is for brackish injection/abstraction to not adversely impact groundwater dependent vegetation prior to mining taking place and to ensure water quality and levels are not significantly deteriorated prior to future dewatering activities.

Trigger System

The GWOS includes a network of monitoring bores (Figure 5, Appendix 2) with defined trigger levels (see Table 10, Appendix 1 for a summary table) to ensure management objectives specified in the Ministerial Statements are maintained. A two-tiered system is used.

- **class 1** trigger levels serve as an internal early warning for potential unexpected groundwater level, water quality and water chemistry changes which may require operational changes.

  If class 1 trigger is exceeded, it will be investigated by initiating hydrogeological assessment and changes to the water management system, including redirecting disposal to other reinjection areas or void mine pits and adjusting abstraction/ injection volumes in impacted area.

- **class 2** trigger levels are for groundwater level or quality changes that may potentially impact upon the environment and future beneficial use of the aquifer and which require operational changes. Class 2 triggers are based on regulatory requirements and are required to be reported to DWER.

  If a class 2 trigger is exceeded it will be investigated by initiating hydrogeological assessment and modification to operational activities to ensure that groundwater level and salinity changes do not continue to breach the value, including:

  - adjust abstraction volumes and/or injection volumes in the impacted area;
  - redirecting water to other injection areas or void mine pits (where available);
  - implement the "Dewatering Discharge Contingency Procedure" allowing the discharge of up to 20,000 k/L per day (FMG, 2014).

Internal class 1 triggers for brackish and saline reinjection areas have been set at the following levels:

- Water table to be maintained 3 m below ground level (m bgl);
- Oakover formation to be maintained 0.5 m bgl;
- Marra Mamba formation to be maintained 3 m bgl;
- For zone C brackish reinjection areas a water quality salinity trigger is set at 9,000µS/cm;
- For zone B saline reinjection areas:
  - If the baseline is greater than 9,000µS/cm no trigger level applies;
  - If baseline is greater than 6,000µS/cm but less than 9,000µS/cm, then the trigger is set at 50% above baseline; and
  - If baseline is less than 6,000µS/cm, then the trigger is set at 9,000µS/cm.

Class 2 triggers for brackish and saline reinjection areas have been set at the following levels:

- Water table to be maintained at 2.2 m bgl;
- Site specific trigger values for key parameters have been defined as part of the life of mine geochemistry program (FMG 2015)

Groundwater quality in deep and shallow aquifers

The GWOS groundwater monitoring bore network have wells which monitor and are screened across separate aquifers (i.e. the deeper Oakover aquifer and shallow alluvial aquifer). The most recent 2023 groundwater monitoring summary and triennial groundwater review (2020 – 2022) submitted to the department (as required by the groundwater operating strategy and section 5C groundwater licences) generally show differences in the electrical conductivity of the deeper Oakover aquifer as compared to the overlying aquifer (i.e. lower EC) within the saline reinjection areas (see Figure 12 and Figure 13 of Appendix 2).

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

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.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this amendment report are detailed in Table 3 below. Table 3 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

Given the distance to human receptors (closest being 45 km north west of the premises boundary), the Delegated Officer has excluded potential impacts associated with noise from the risk assessment.

Table 3: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Category 77 – concrete batching			
Dust	Works associated with the mobilisation and construction of the concrete batch plant and associated infrastructure	Air/windborne pathway causing poor vegetation health/death	Proposed controls: • Use of water carts; and • Vehicle speed restrictions.
Sediment laden stormwater		Surface water run off causing poor vegetation health/death and/or contamination of nearby surface water receptors	Proposed controls: • Locate the plant at least 50 metres away from major surface water bodies • Installation of diversion structures such as bunds, channels and drains to separate and divert clean surface water flows around CBP work areas and stockpiles; • Install sediment basins, bunding and vegetated batters to reduce surface water sediment and maintain quality; • Collecting stormwater drainage, wash-down water and spillages from CBP work areas to designated collection points and sedimentation traps for treatment and re-use or release into the surrounding environment; and • Concrete load bay and pad design area to include a wedge pit for first flush and wash out pit.
Operation			
Category 5 – increased tailings elevation			

Emission	Sources	Potential pathways	Proposed controls
Tailings and contaminated water (metals)	Increased tailings beach elevation and additional tailings storage within Brampton in-pit TSF	Overtopping of TSF and direct discharge	Existing licence controls: • Maintain a minimum freeboard equivalent to that required to contain a 1 in 100 year storm event over 72 hours from the operational pond surface to lowest elevation of perimeter embankment. Existing licence monitoring: • Visual markers installed at the deposition ramp for freeboard monitoring; and • Visual freeboard inspection whilst operational and within 24 hours of significant rainfall event.
		Increased seepage causing water table mounding which may adversely impact the health of adjacent native vegetation	Existing licence controls: • Decant pump used to transfer decant water for reuse at the ore processing facility Existing monitoring • Seven groundwater monitoring bores surrounding the TSF are monitored for a suite of parameters including standing water level, pH, EC, TDS, major cations and anions, metals, metalloids and non-metals.
Category 6 – increased abstraction/reinjection			
Mine dewater (saline to hypersaline: up to 150,000 mg/L TDS)	Increased re-injection of mine dewater (saline to hyper saline): additional 25 GL	Direct injection of mine dewater causing pressurisation of the Oakover aquifer which may result in vertical migration through the confining clay layer into the overlying shallow aquifer. This may reduce the water quality of the overlying aquifer and cause impacts to native vegetation.	Controls under the RIWI Act Management via a groundwater operating strategy, developed in accordance with RIWI Act approvals, described in section 2.4.1 of this report, which includes management action triggers for both groundwater levels and groundwater quality. Existing licence controls: • Injection of saline water into the Oakover aquifer only; • Specifies separate brackish and saline injection areas; • Bores require downhole flow control valves, flow metres and pressure gauges; and • Nominated discharge points in the event that contingency discharge of mine dewater is required. Existing licence monitoring:

Emission	Sources	Potential pathways	Proposed controls
			• Monitoring for the volume of saline and brackish reinjection; • Monitoring a selection of mine dewater pipeline and reinjection bores (see Figure 7 and Figure 8 of Appendix 2) for a suite of parameters including pH, EC, TDS, TSS, major cations and anions, metals, metalloids and non-metals; and • If contingency discharge is required, monitoring is conditioned for electrical conductivity, turbidity and volume of water discharged at 24 hourly intervals.
Category 77 – concrete batching			
Dust	Operation of a concrete batching plant	Air/windborne pathway causing poor vegetation health/death	<u>Proposed controls:</u> • Fitting a dedicated spray water system to aggregate storage areas, consisting of multiple sprinklers positioned to ensure full coverage; • Allocating responsibility for controlling dust emissions to the site supervisor including the functions of assessing conditions, operating the spray water system and visual monitoring of dust emissions; • Use of water carts; and • Vehicle speed restrictions.
Sediment laden stormwater		Surface water run off causing poor vegetation health/death and/or contamination of nearby surface water receptors	<u>Proposed controls:</u> • Plant operated at lease 50 metres away from major surface water bodies; • Installation of diversion structures such as bunds, channels and drains to separate and divert clean surface water flows around CBP work areas and stockpiles; • Install sediment basins, bunding and vegetated batters to reduce surface water sediment and maintain quality; • Collecting stormwater drainage, wash-down water and spillages from CBP work areas in designated collection points and sedimentation traps for treatment and re-use or release into the surrounding environment; and • Concrete load bay and pad design area to include a wedge pit for first flush and wash out pit. Waste concrete will be disposed of at the landfill on-site in

Emission	Sources	Potential pathways	Proposed controls
			accordance with existing licence conditions.
Hydrocarbons	Operational area spills/leaks	Surface water run off causing poor vegetation health/death and/or contamination of nearby surface water receptors	Proposed controls: • Storing hydrocarbons, lubricants and greases in bunding in accordance with relevant Australian Standards including AS1940-2004 *Storage and Handling of Flammable and Combustible Liquids*, AS3780-*2008 Storage and Handling of Corrosive Substances* and AS3833-2007 *Storage and Handling of Mixed Classes of Dangerous Goods*; • Providing spill kits in areas where an increased risk of chemical and hydrocarbon spills exists; and • Disposing of waste chemicals and hydrocarbons and contaminated material to an appropriately licenced facility.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 4 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)). The Aboriginal community Mumbultjar is the closest to the site, located approximately 45 km north west of the premises boundary. The nearest town is Nullagine, located 80.42 km north east of the premises boundary.

Table 4: Sensitive environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Fortescue marsh (surface water) • Environmentally sensitive area; • Priority 1 threatened ecological community • Key biodiversity area • Proposed Ramsar wetland (draft) Fortescue Marsh is a nationally important and the largest ephemeral wetland in the Pilbara region, and is listed on the Directory of Important Wetlands of Australia as a wetland of national significance. Broad scale flooding of the Fortescue Marsh occurs on a frequency of about one year in ten, with inundation persisting for three to six months (EPA Report 1429). Yintas (semi-permanent pools) are located along the northern shoreline of the Fortescue Marsh, with two of	Intersects with the southern premises boundary (Figure 9, Appendix 2).

these having part of their catchment area within the Cloudbreak project area. It supports conservation significant fauna and priority ecological communities.	
<u>Groundwater</u> *Rights in Water Irrigation Act 1914* – Pilbara Groundwater Area Groundwater in the project area is generally brackish (>500 mg/L TDS) and becomes increasingly saline towards the Fortescue Marsh and with depth (>100,000 mg/L TDS). Salinity increases with depth, with the upper tertiary detritals (shallow aquifer) having a salinity of 1,000 to 2,000 mg/L TDS, Marra Mamba Formation reaching up to 6,000 mg/L TDS and the deeper Lower Marra Mamba and Wittenoom Formations having a salinity of 5,000 to 11,000 mg/L TDS. The Oakover Formation to the south of the resource area has monitored TDS of up to 150,000 mg/L (EPA Report 1429). See section 2.4.1 for further detail regarding hydrogeology and section 3.1.3 below for a summary of recent groundwater quality monitoring associated with licence L8199/2007/2.	<u>Groundwater depth</u> The most recent (FMG 2023a) annual environmental report (as required by licence L8199/2007/2) reported the following: • Mine dewater reinjection groundwater monitoring bores recorded groundwater levels ranging between 7.77 and 28 m bgl (note no differentiation between target aquifers is given for this monitoring); • Tailings storage facility monitoring bores recorded groundwater levels ranging between 15.87 and 45.35 m bgl (note no differentiation between target aquifers is given for this monitoring). <u>Groundwater flow direction:</u> Groundwater movement within the Cloudbreak area is topographically driven by rainfall recharge on the elevated areas of the Chichester Range and movement of groundwater in a southerly direction towards Fortescue Valley. Southward flow of the topographically driven fresh groundwater is opposed by a northward pressure gradient associated with density driven saline groundwater. The saline groundwater has evolved through evapo-concentration and outward convection beneath the Fortescue Marsh. As a result, a salinity transition zone develops at the interface of the two density driven flow regimes, with fresh/brackish water overlying saline/hypersaline water.
<u>Groundwater beneficial uses</u> There are two active pastoral bores located within the premises boundary; being Moojarri bore and Thieves bore. Fortescue have indicated that the Nick's Bore, Muirs Bore, Minga Bore, Mulga Bore and Cooks Bore are inactive.	Within the premises boundary as shown in Figure 14 of Appendix 2.
<u>Flora</u> Flora and vegetation surveys have identified several priority flora species in and near the mining area, including *Eremophila spongiocarpa* (Priority 1), *Nicotiana heterantha* (Priority 1), *Gymnanthera cunninghamii*	Within and adjacent to the prescribed premises boundary (see Figure 10 and Figure 11, Appendix 2)

(Priority 3), *Phyllanthus aridus* (Priority 3), *Rostellulaira adscendens var. latifolia* (Priority 3), *Themeda* asp. Hamersley Station (Priority 3), *Eremophila youngii* subsp. *Lepidota* (Priority 4) and *Goodenia nuda* (Priority 4). Ecologically important vegetation communities have been identified within the survey area including Samphire (*Tecticornia* sp.), Mulga *(Acacia aneura*) and groundwater dependant vegetation Coolibah (*Eucalyptus victrix*) and River Red Gum (*Eucalyptus camaldulensis*) (EPA Report 1429)	
<u>Fauna</u> A search of DWER's database indicate 43 occurrences of threatened fauna within and 300 m surrounding the tenement boundary. Of these: • 33 occurrences of "threatened – vulnerable" mammal species; • 5 listed as "specially protected – other specially protected" • 4 occurrences listed as "specially protected – migratory" bird species • 1 occurrence listed as "threatened critically endangered" bird species Fauna studies conducted within and adjacent to the project area recorded 25 species of conservation significance, including the Night Parrot (*Pezoporus occidentalis*), Greater Bilby (*Macrotis lagotis*), Pilbara Leaf-Noise Bat (*Rhinonicteris aurantia*) and Pilbara Olive Python (*Liasis olivaceua barroni*) which are listed under the EPBC Act. Stygofauna surveys conducted in the vicinity of the Cloudbreak area have identified 23 stygofauna species. Of these, two appear to be restricted to the vicinity of the proposal area. (EPA report 1429)	Within and adjacent to the prescribed premises (see Figure 10, Appendix 2)

3.1.3 Groundwater quality monitoring under L8199/2007/2

The most recent (FMG 2023a) annual environmental reported (as required by licence L8199/2007/2) recorded the following groundwater quality:

- Mine dewater reinjection groundwater monitoring bores:
  - electrical conductivity (EC) ranging from 3,360 to 106,000 µS/cm (noting that target aquifers have not been differentiated in L8199/2007/2 monitoring – see section 2.4.1 for monitoring specific to separate aquifers);
  - total dissolved solids (TDS) ranging from 2,320 to 79,900 mg/L;
  - pH ranging from 6.29 to 6.75;
  - elevated levels of nitrate (up to 59 mg/L), antimony (up to 0.016 mg/L), nickel (up to 0.027 mg/L) and zinc (up to 0.26 mg/L)
- Tailings storage facility groundwater monitoring bores:
  - EC ranging from 2,500 to 83,100 µS/cm (noting that target aquifers have not been differentiated);
  - pH ranging from 5.61 to 6.62;
  - elevated levels of nitrate (up to 27.8 mg/L), iron (up to 2.85 mg/L), manganese (up to 3.62 mg/L) and thallium (up to 0.0005 mg/L)

The department queried elevated nitrate levels and Fortescue responded on 23 August 2024 that they are currently progressing with a nitrate source assessment study which is anticipated to be completed by late 2025. Fortescue has also established an internal multidisciplinary “Nitrate management working group” to drive future investigations as required.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the licence holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the licence holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the licence holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The revised licence L8199/2007/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. category 5, 6 and 77 activities.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Category 77 – concrete batching								
Works associated with the mobilisation and construction of the concrete batch plant and associated infrastructure	Dust	Air/windborne pathway causing poor vegetation health/death	Adjacent priority flora and native vegetation (including fauna habitat)	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 9 (renumbered to 8): amended to include concrete batch plant construction requirements, including dust management	Given the short duration of construction activities, the proposed controls for dust suppression with water cart are considered sufficient and have been placed on the licence as a regulatory control.
	Sediment laden stormwater	Surface water run off causing poor vegetation health/death and/or contamination of nearby surface water receptors	Adjacent priority flora and native vegetation (including fauna habitat) Surface water lines - drainage to Fortescue marsh (~2.5 km south) and semi-permanent pools	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 9 (renumbered to 8): amended to include concrete batch plant construction requirements, including stormwater management	Given the short duration of construction activities, the proposed controls for storm water management are considered sufficient and have been placed on the licence as a regulatory control.
Operation								
Category 5 – increased tailings elevation								
Increased tailings beach elevation and additional tailings storage within Brampton in-pit TSF	Tailings and contaminated water (metals)	Overtopping of TSF and direct discharge	Adjacent priority flora and native vegetation (including fauna habitat) Surface water lines - drainage to Fortescue marsh (~2.5 km	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	N	**Condition 3 (renumbered to 2): amendment to spigot elevation and freeboard requirement (0.5 m in addition to capacity for a 1 in 100 year 72 hour storm event**)	Deposition modelling conducted by the applicant indicates that even with the spigot elevation modification the in-pit TSF will have sufficient capacity to contain a 1 in 100 year 72 hour storm event with an available 1.9 m freeboard above the maximum operating level (see section 2.2.1 for further detail).

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
			south) and semi-permanent pools					Given that this demonstrates sufficient freeboard, DWER has amended the maximum tailings deposition elevation. <u>DWER control:</u> The licence does not currently specify that there should be a minimum 0.5 m freeboard (standard for tailings storage facilities) below pit spill point in addition to sufficient volume to contain a 1 in 100 year storm event over 72 hours from the operational pond surface. To mitigate risk associated with overtopping this has been placed on the licence as a regulatory control.
		Increased seepage causing water table mounding which may adversely impact the rootzones of adjacent native vegetation	Adjacent priority flora and native vegetation (including fauna habitat)	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	N	**<u>Condition 22 (renumbered to 21): amended to include a maximum groundwater level for Brampton in-pit monitoring bores (4 m bgl)</u>**	Monitoring during 2023 indicate groundwater levels range between 15.87 and 45.35 m bgl surrounding Brampton in-pit TSF. Given the depth to ground water, the Delegated Officer considers it unlikely that releasing additional capacity within the in-pit TSF will impact the rootzones of adjacent native vegetation. However, the licence does not currently specify a maximum groundwater elevation for monitoring bores surrounding the tailings storage facility. <u>DWER control</u> To mitigate the risk associated with groundwater mounding, a maximum groundwater level of 4 m bgl has been specified for monitoring bores surrounding the TSF.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Category 6 – increased abstraction/reinjection								
Increased re-injection of mine dewater (saline to hyper saline): additional 25 GL	Mine dewater (saline to hypersaline: up to 150,000 mg/L TDS)	Direct injection of mine dewater causing pressurisation of the Oakover aquifer which may result in vertical migration through the confining clay layer into the overlying shallow aquifer. This may reduce the water quality of the overlying shallow aquifer and cause impacts to native vegetation and surface water receptors	Adjacent priority flora and native vegetation (including fauna habitat) Fortescue marsh and semi-permanent pools	Refer to Section 3.1	C = Major L = Unlikely **Medium Risk**	Y	Existing licence controls: Condition 9 (renumbered to 8): Injection of saline water into the Oakover aquifer only Specifies separate brackish and saline injection areas; Bores require downhole flow control valves, flow metres and pressure gauge. Condition 12 (renumbered 11): Nominated discharge points in the event that contingency discharge of mine dewater is required.	To support requirements under the RIWI Act and Part IV of the EP Act, the site operates under a Groundwater Operating Strategy which includes monitoring and management action for changes in groundwater quality of the shallow aquifer overlying the Oakover aquifer (see section 2.4.1 of this decision report for further detail). The licence holder will be required to amend their groundwater section 5C licences under the RIWI Act to increase abstraction/reinjection by 25 GL and may be required to review and update their groundwater operating strategy at this time. The delegated officer considers that, in combination with management under other regulatory functions (i.e. RIWI Act), the existing Part V licence controls are considered sufficient to mitigate the risk associated with additional aquifer abstraction/reinjection.
Category 77 – concrete batching								
Operation of a concrete batching plant	Dust	Air/windborne pathway causing poor vegetation health/death	Adjacent priority flora and native vegetation (including fauna habitat)	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 9 (renumbered 8): amended to include concrete batch plant construction requirements, including dust management	The proposed controls for dust suppression with water cart and sprinkler fittings are considered sufficient and have been placed on the licence as regulatory controls.
	Sediment laden stormwater	Surface water run off causing poor vegetation health/death	Surface water lines - drainage to Fortescue marsh (~2.5 km	Refer to Section 3.1	C = Minor L = Unlikely	Y	Condition 9 (renumbered to 8): amended to include concrete batch plant construction requirements,	The proposed controls for storm water management are considered sufficient and have been placed on the licence as regulatory controls.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
		and/or contamination of nearby surface water receptors	south) and semi-permanent pools		**Medium Risk**		including stormwater management	
	Hydrocarbon spills and leaks			Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 9 (renumbered to 8): amended to include concrete batch plant construction requirements, including bunding for hydrocarbon/chemical storage	The proposed controls for hydrocarbon spills and leaks are considered sufficient and have been placed on the licence as regulatory controls.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 25/06/2024	N/A	N/A
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 24/06/2024	*DEMIRS replied on 28/06/2024 advising that:* *"The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) has reviewed the application form and supporting documentation provided. Proposed works are subject to the Iron Ore (FMG Chichester Pty Ltd) Agreement Act 2006, and Ministerial Statement No 899 issued under Part IV of the Environmental Protection Act 1986. Proposed works are not subject to the provisions of the Mining Act 1978, and DEMIRS has no comments on the proposed amendment to licence L8199/2007/2."*	N/A
Palyku-Jartayi Aboriginal Corporation advised of proposal on 24/06/2024	N/A	N/A
Karlka Nyiyaparli Aboriginal Corporation advised of proposal on 24/06/2024	N/A	N/A
Licence Holder was provided with draft amendment on 11 July 2024	Refer to Appendix 3	Refer to Appendix 3

5. Conclusion

Based on the assessment in this amendment report, the Delegated Officer has determined that a revised licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised licence as part of the amendment process. Please note that some administrative amendments have also been made to modernise the licence.

Table 7: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Prescribed premises categories revised to reflect: • Category 6 amendment from 150GL to 175 GL • Addition of category 77
1	Administrative deletion of redundant condition 1 and Table 1. The prescribed premises assessed production/design capacities are specified on the cover page of the licence.
Renumbering of conditions and tables	Given deletion of condition 1 and Table 1, all subsequent conditions and tables have been renumbered.
3 (renumbered to 2)	Maximum tailings elevation amended to RL 426.7m Freeboard requirement minimum 0.5 m specified, in addition to containment for a 1 in 100 year 72 hour storm event.
9 (renumbered to 8)	Construction/operational requirements placed for concrete batching plant Removal of reinjection bores which have already been completed and have been determined by DWER to meet the construction compliance condition: SRP340, SRP342, SRP344, SRP348, SRP349, SPR350, SRP359, SRP319, SRP321, SRP322R, SRP323, SRP324, SRP325, SRP326, SRP327.
12 (renumbered to 11)	Condition 12 Table 8 has been amended to include the following text for on-going operation of the reinjection bores: "Injection into the Oakover aquifer only for Saline Injection Bores, and the Marra Mamba formation for Brackish Injection Bores only at locations depicted in the Maps titled *The location of the brackish and saline water emission points* in Schedule 1 of this Licence. When connected to an active injection line, downhole flow control valves, flow meters, pressure gauges must be maintained"
22 (renumbered to 21)	A maximum groundwater level limit (4 mbgl) was placed for monitoring bores surrounding Brampton in-pit TSF.
Schedule 2	Administrative deletion of redundant Schedule 2. The prescribed premises assessed production/design capacities are specified on the cover page of the licence.
Definitions	References to Schedule 2 and 3 deleted (Schedule 3 deleted in a previous amendment)

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Environmental Protection Authority 2012, *EPA Report 1429 Cloudbreak Life of Mine Project*
5. Fortescue Metals Group (FMG) 2014, Fortescue Metals Group, 2014, *Dewatering discharge contingency procedure revision 4*, Document No. CH-PR-EN-0003, Fortescue Metals Group, Perth.
6. Fortescue Metals Group (FMG) 2015, Life of Mine Geochemistry Programme - Site Specific Trigger Values, 20 May 2015; 45-SY-EN-0001. Fortescue Metals Group, Perth.
7. Fortescue Metals Group (FMG) 2022 *Cloudbreak Triennial Groundwater Monitoring Review 2022*
8. Fortescue Metals Group 2023, *Cloudbreak Annual Groundwater Monitoring Summary* (submitted for section 5C licences)
9. Fortescue Metals Group (FMG) 2023a, *Annual Environmental Monitoring Report* (submitted for Part V licence)
10. Fortescue 2024, Licence Amendment Attachment 3B Supporting Document Cloudbreak Iron Ore Mine L8199/2007/2
11. Fortescue 2024a, Response to Request for Information dated 11 June 2024

Appendix 1: Additional tables

Table 8: Modelling criteria used to quantify capacity remaining within Brampton in-pit TSF

Metric	Indicative value
Freeboard requirement	0.5 m below pit spill point
Spill point	RL 420.9 m AHD
Storm storage	918,400 m^3 (RL 420.4 m AHD)
Maximum operating level	RL 418.1 m AHD (232,000 m^3)
Maximum tailings level at spigots	0.3 m below pit crest
Tailings density sub-aerial	1.5 t/m^3
Tailings density sub-aqueous	1.28 t/m^3
Tailings beach slope sub-aerial	0.8 %
Tailings beach slope sub-aqueous	• 0 - 100 m (2.4%) • 100 – 250 m (7.10%) • +250 m (0.37%)
Available storage volume	34,706,970 m^3

Table 9: Tailings weight characterisation FY 2023/2024

Month-Year	Weight Concentration (% w/w)
Jul-2023	45
Aug-2023	44
Sep-2023	44
Oct-2023	42
Nov-2023	46
Dec-2023	45
Jan-2024	42
Feb-2024	46
Mar-2024	46
Apr-2024	46
May-2024	45

Table 10: Groundwater operating strategy trigger level framework

Groundwater Management Area	Monitoring Area	Aquifer	Groundwater level trigger		Groundwater Quality (salinity) trigger	Groundwater Chemistry trigger	Trigger Basis
			Class 1	Class 2	Class 1	Class 1	
Mining Zone	Tailings	Multiple	N/A	N/A	N/A	Site Specific Trigger values for key parameters have been defined as part of the Life of Mine Geochemistry Programme (FMG 2015c).	• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	Landfill	Multiple	N/A	N/A	N/A		• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	AMD	Multiple	N/A	N/A	N/A		• Class 1 groundwater chemistry trigger to provide early warning of potential change.
	Inactive Pits	Marra Mamba Formation	>410mAHD	N/A	95,000 µS/cm		• Class 1 groundwater level trigger to prevent rebound above pre mining groundwater levels. Baseline water levels in the Marra Mamba Formation is approximately 410 mAHD across the ore body at Cloudbreak. • Class 1 EC trigger assigned to ensure water is of suitable quality for future disposal via saline injection infrastructure (95,000 µS/cm equates to commonly observed Oakover Formation salinity and is about 20% higher than the salinity currently flowing into Hook Pit).
Zone A	Near-marsh	Watertable (MS962)	Change of ±0.65 m with regard for climatic trends and seasonal variation.	Change of ±1 m with regard for climatic trends and seasonal variation.	N/A		• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger as stipulated in Condition 7 of Ministerial Statement 962 (groundwater levels – Fortescue Marsh). • *'The proponent shall manage the injection of surplus water to ensure that groundwater levels do not rise or drop more than 1 metre at the fringe and within the Fortescue Marsh, from the baseline groundwater level, using a suitable network of bores at the fringe of the Fortescue Marsh, having regard for climatic trends and seasonal variation.*
		Watertable (non MS962)	Change of ±1 m with regard for climatic trends and seasonal variation.	N/A	N/A		• Class 1 groundwater level trigger to provide early warning.
		Oakover Formation	Trigger is specific to each bore. See K.3.3.	N/A	N/A		• Class 1 groundwater level trigger to provide early warning against over pressurisation of the deep aquifer due to saline injection and excessive drawdown due to abstraction.
Zone B	Saline injection	Watertable	3 m below ground level	2.2 m below ground level	If baseline is greater than 9,000 µS/cm then no trigger level applies. If baseline is greater than 6,000 µS/cm but less than 9,000 µS/cm, then trigger is set at 50% above baseline. If baseline is less than 6,000 µS/cm, then trigger is set at 9,000 µS/cm.		• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger as stipulated in Condition 6 of Ministerial Statement 899 (conservation significant vegetation – indirect impacts). *'The proponent shall manage the proposal in a manner that ensures there is no adverse impact to* ***conservation significant vegetation as a result of implementing this proposal'****.*
		Oakover Formation	0.5 m below ground level [2]	N/A			
Zone C	Brackish injection	Watertable	3 m below ground level	2.2 m below ground level			• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger as stipulated in Condition 6 of Ministerial Statement 899 (conservation significant vegetation – indirect impacts). *'The proponent shall manage the proposal in a manner that ensures there is no adverse impact to conservation significant vegetation as a result of implementing this proposal'.* • Class 1 EC trigger assigned to ensure baseline aquifer water quality is maintained.
		Marra Mamba Formation	3 m below ground level	N/A	N/A		
		Bulk Flow	N/A	N/A	9,000 µS/cm		
Zone D	Phreatophytic	Wtertable	18 m below ground level	20 m below ground level (only applicable to outside the area of approved clearing)	If baseline is greater than 9,000 µS/cm then no trigger level applies. If baseline is greater than 6,000 µS/cm but less than 9,000 µS/cm, then trigger is set at 50% above baseline. If baseline is less than 6,000 µS/cm, then trigger is set at 9,000 µS/cm.		• Class 1 groundwater level trigger to provide early warning and to signal potential future Class 2 conditions. • Class 2 groundwater level trigger only in zone which is outside Part IV clearing boundary. • Groundwater level where phreatophytic vegetation may be susceptible to drawdown of the groundwater level of more than 20m below the ground surface. Ecoscape's impact assessment for dewatering (Ecoscape, 2009). • Class 1 E.C. trigger assigned to ensure baseline aquifer water quality is maintained.

Appendix 2: Additional figures

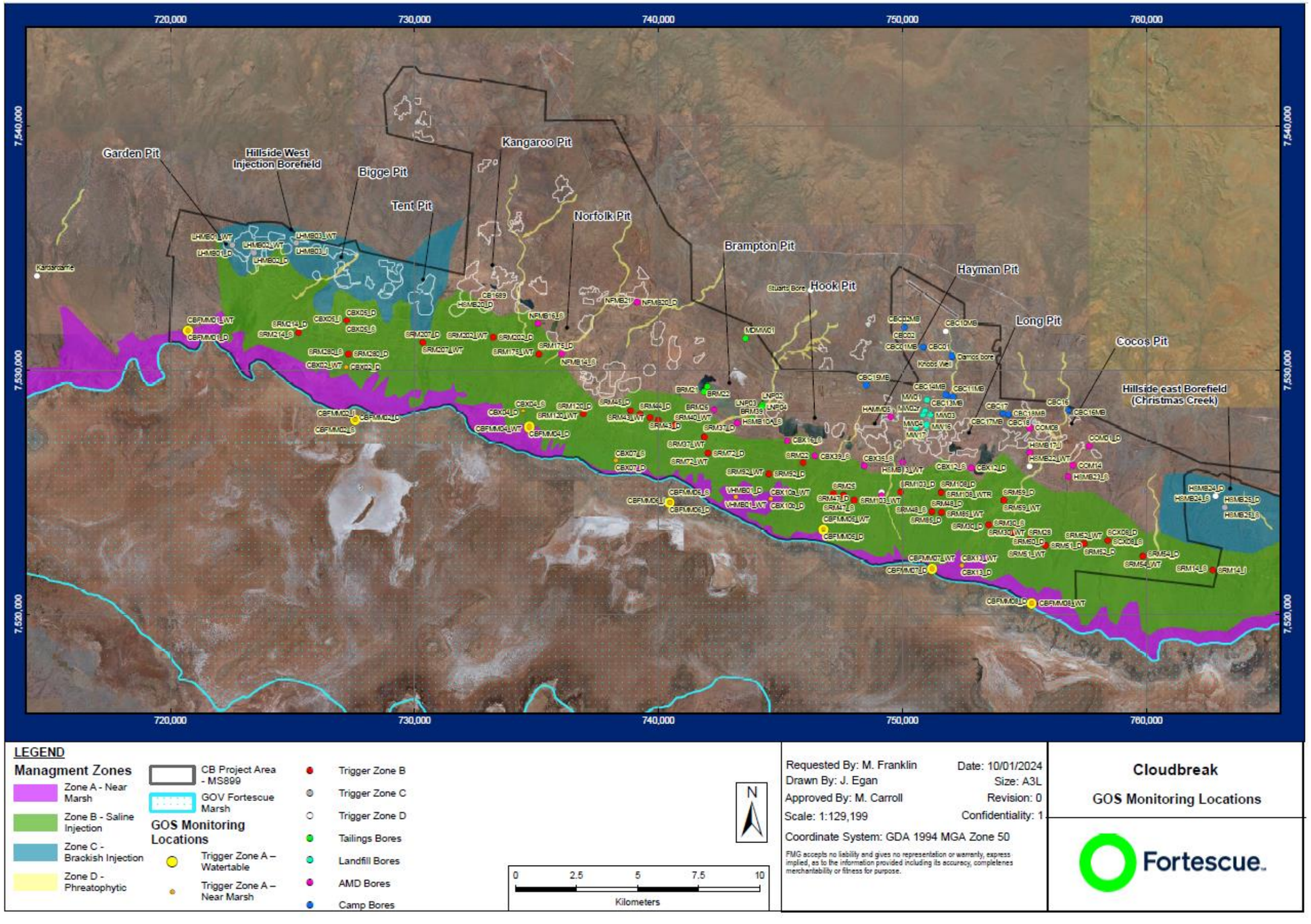


Figure 5: Cloudbreak Groundwater Operating Strategy monitoring bores for trigger levels

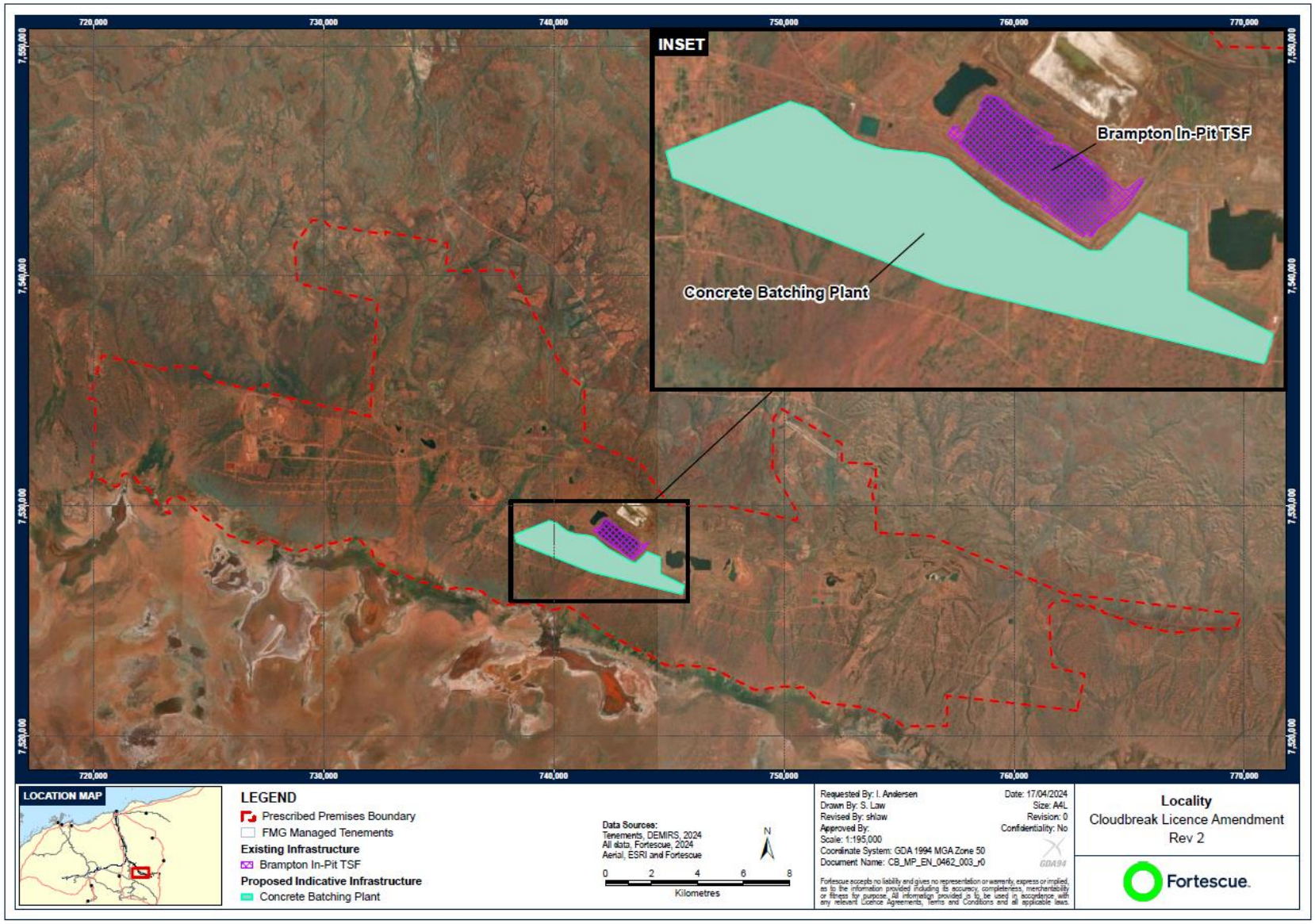


Figure 6: Proposed concrete batch plant location

L8199/2007/2

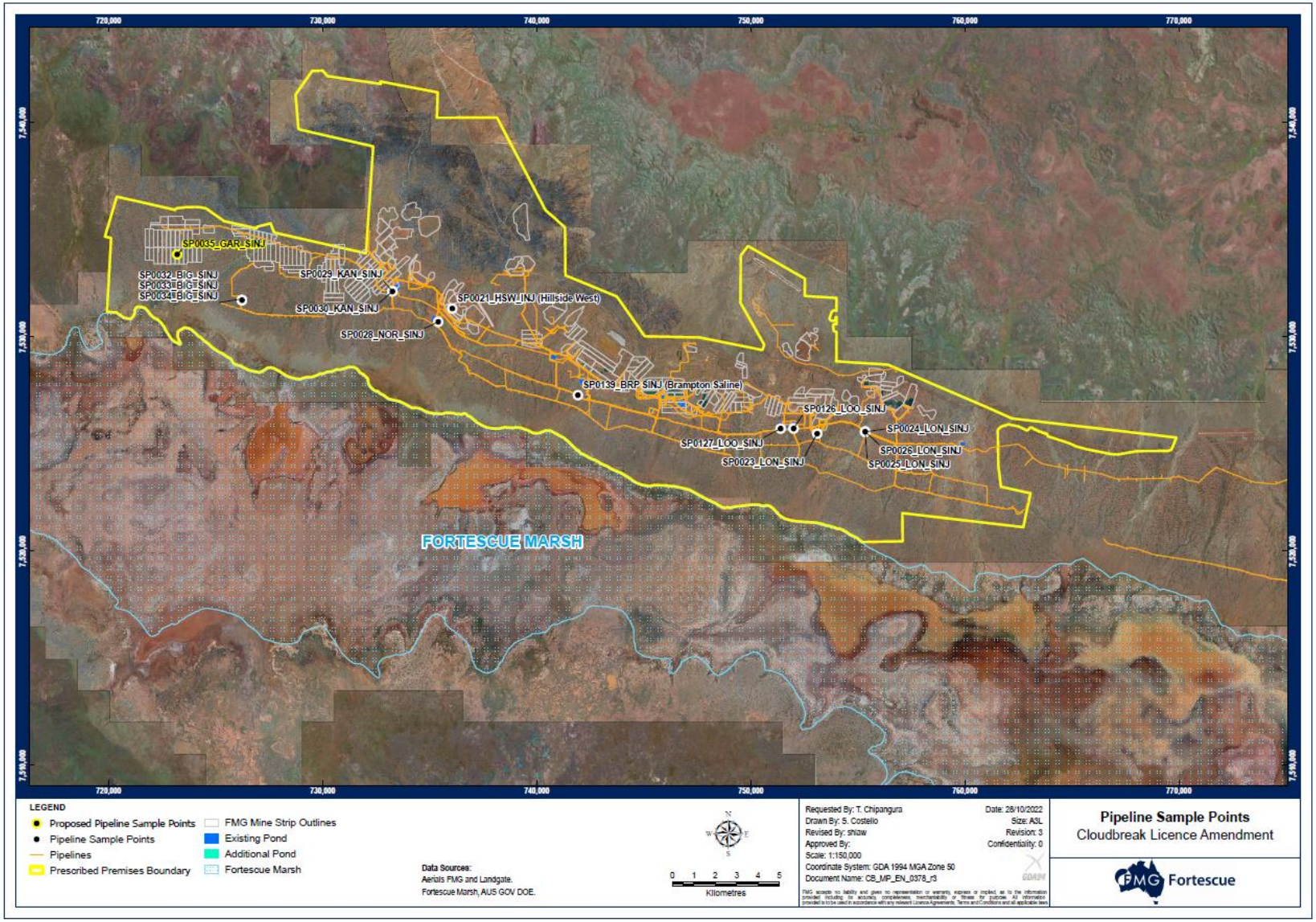


Figure 7 Licence L8199/2007/2 pipeline sample points (mine dewater)

Figure 8 Licence L8199/2007/2 groundwater monitoring points (mine dewater reinjection)

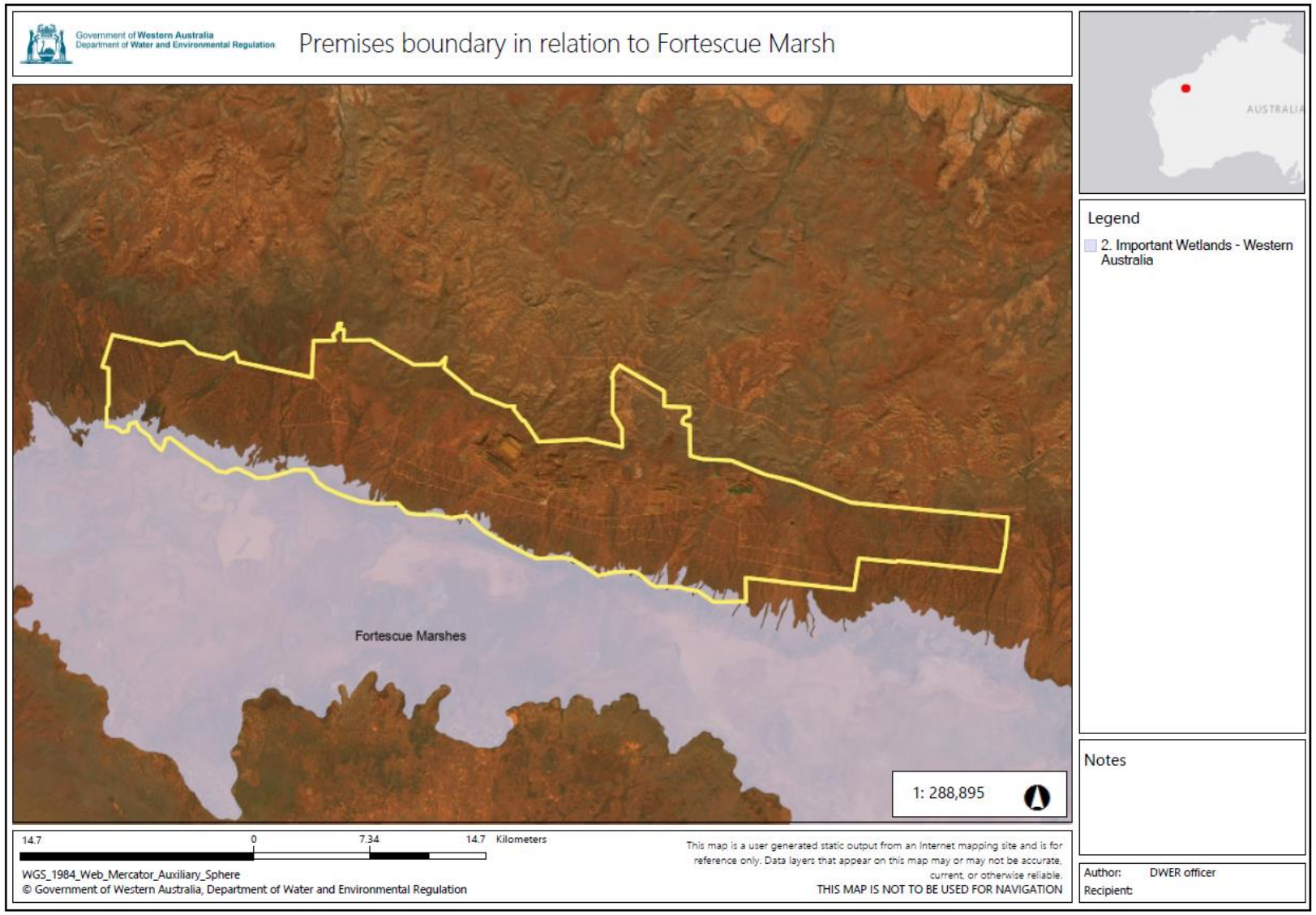


Figure 9: Premises boundary in relation to Fortescue Marsh

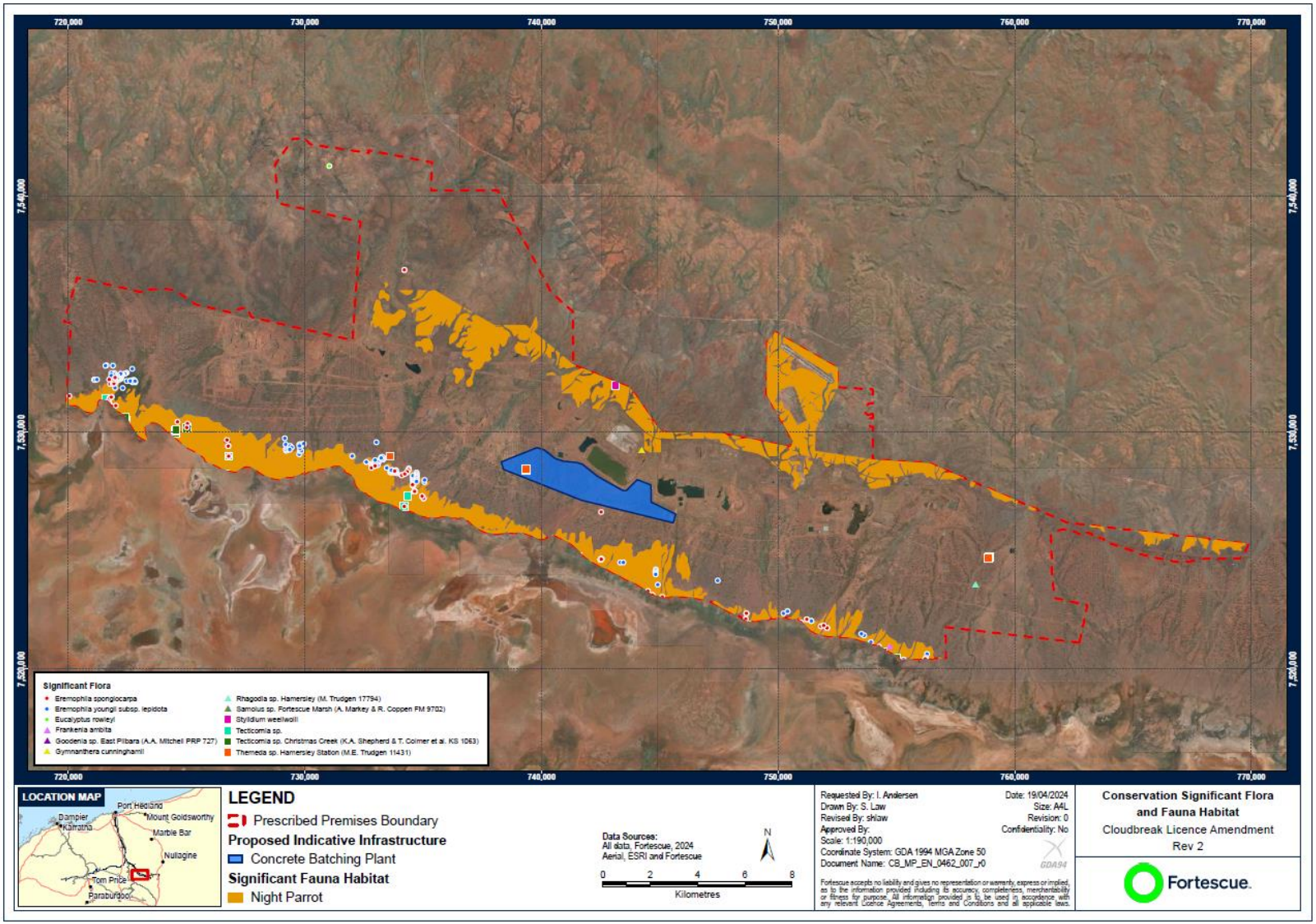


Figure 10 Conservation significant flora and fauna habitat

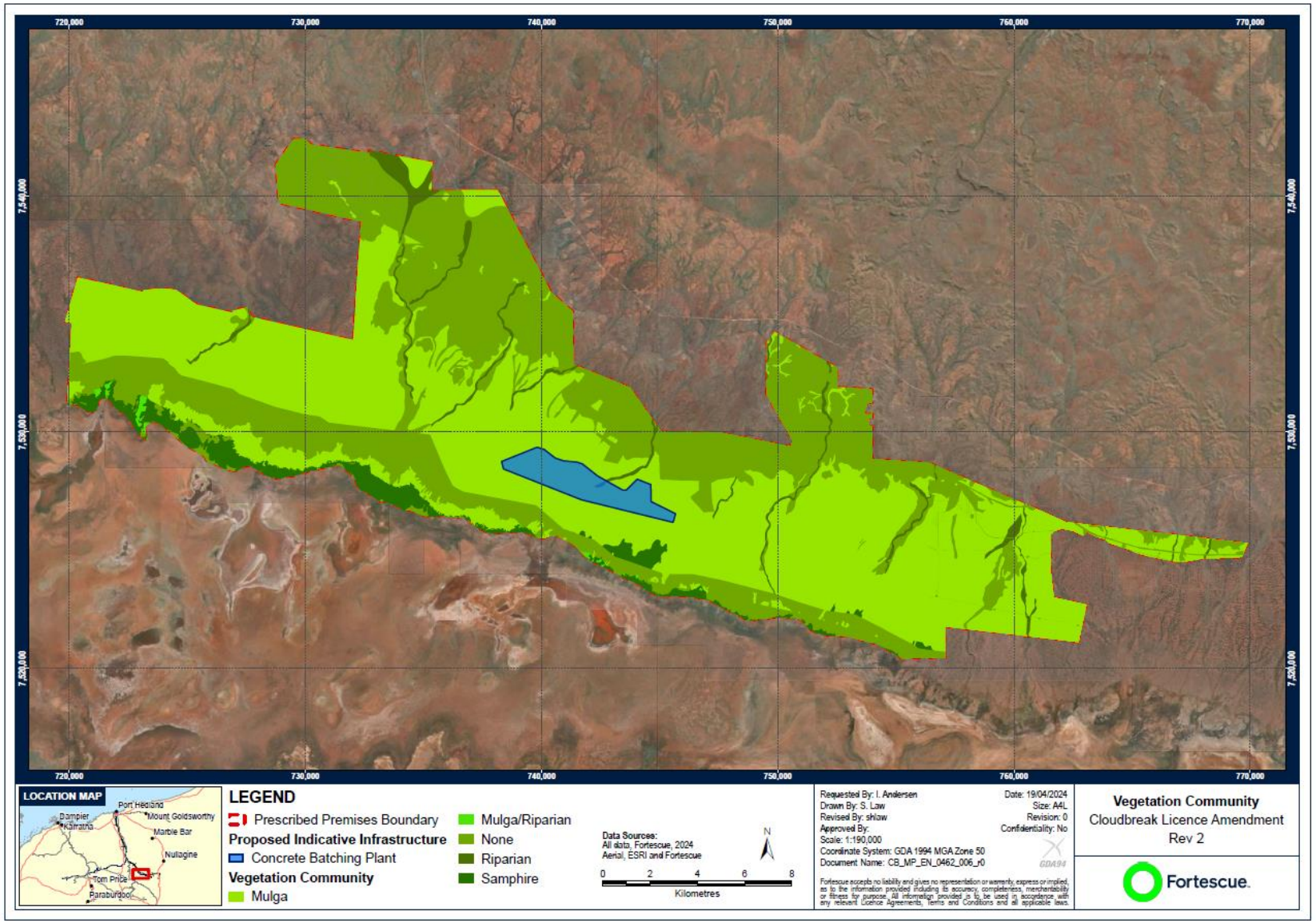
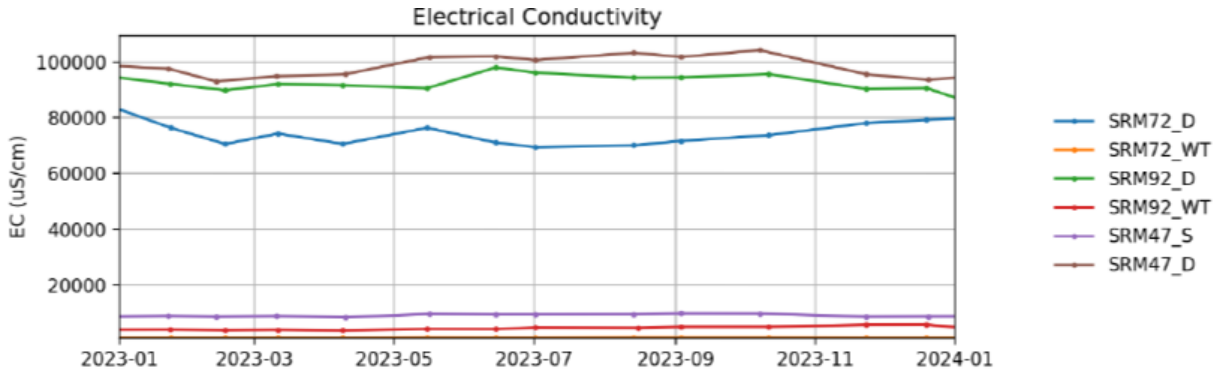
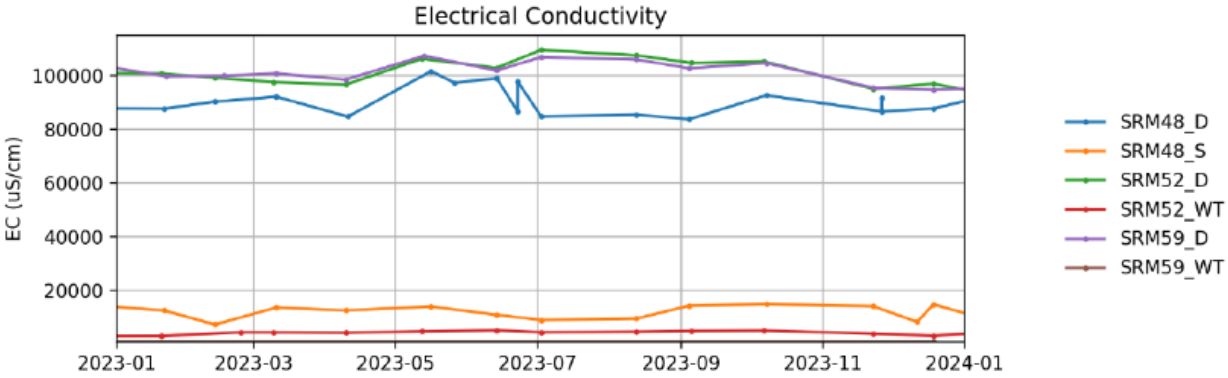


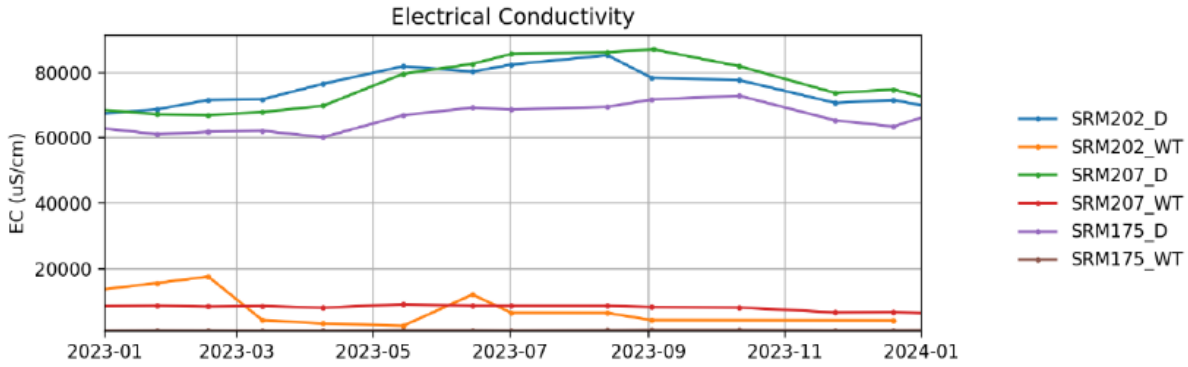
Figure 11: Vegetation communities mapped at the site. Location of concrete batching plant shown



Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM72_D	415.472	Oakover Formation
SRM72_WT	415.06	Alluvial Aquifer (TA/TD)
SRM92_D	417.298	Oakover Formation
SRM92_WT	417.05	Alluvial Aquifer (TA/TD)
SRM47_S	416.441	Alluvial Aquifer (TA/TD)
SRM47_D	416.639	Oakover Formation



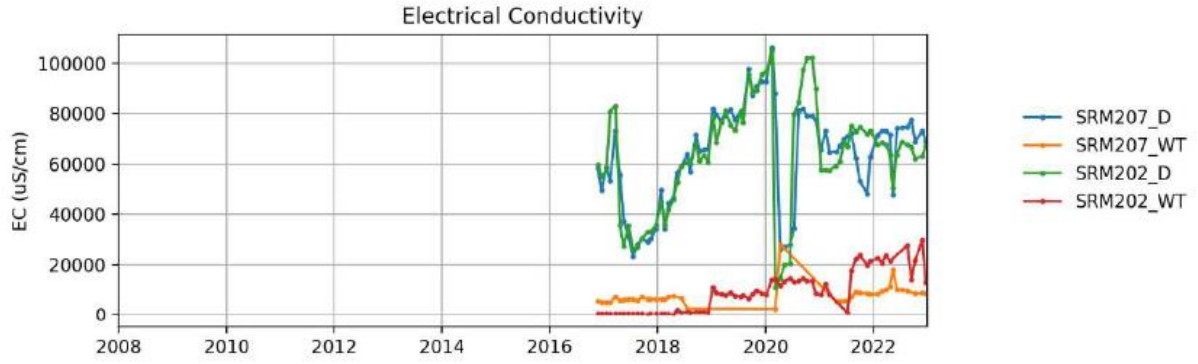
Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM48_D	418.118	Oakover Formation
SRM48_S	417.897	Alluvial Aquifer (TA/TD)
SRM52_D	418.412	Oakover Formation
SRM52_WT	417.951	Alluvial Aquifer (TA/TD)
SRM59_D	421.077	Oakover Formation
SRM59_WT	420.606	Alluvial Aquifer (TA/TD)



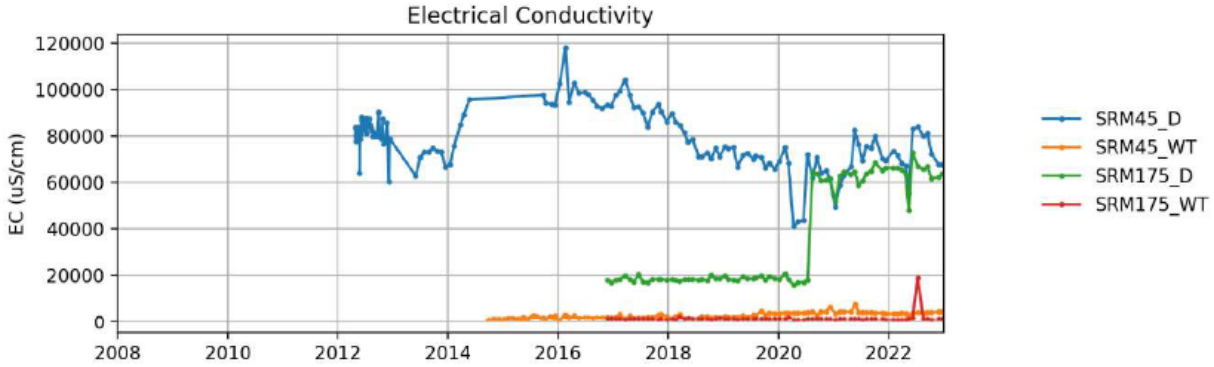
Representative plot for: Zone B - West

Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM202_D	416.897	Oakover Formation
SRM202_WT	416.257	Alluvial Aquifer (TA/TD)
SRM207_D	415.434	Oakover Formation
SRM207_WT	415.059	Alluvial Aquifer (TA/TD)
SRM175_D	416.89	Oakover Formation
SRM175_WT	416.62	Alluvial Aquifer (TA/TD)

Figure 12 2023 electrical conductivity for deep and shallow aquifer in saline reinjection areas (FMG, 2023)

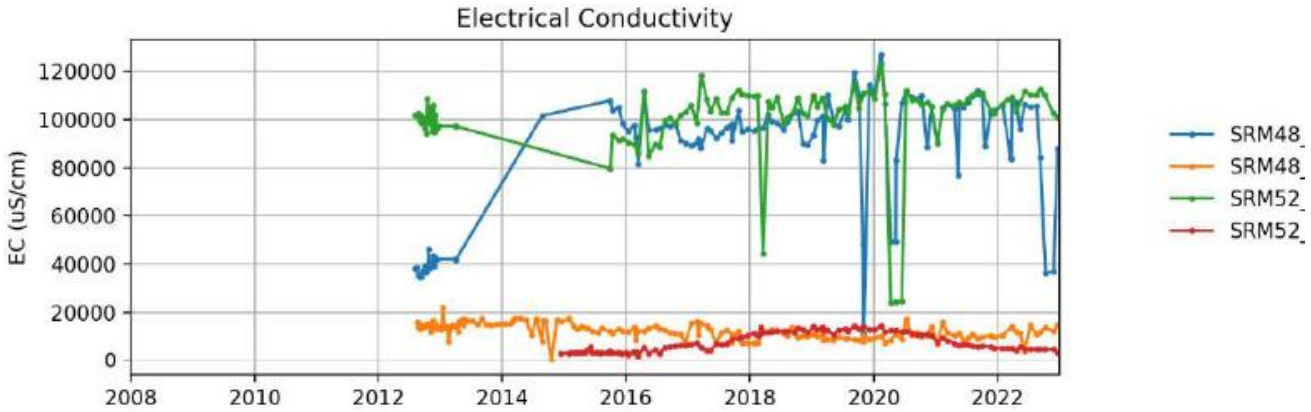


Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM207_D	415.434	Oakover Formation
SRM207_WT	415.059	Alluvial Aquifer (TA/TD)
SRM202_D	416.897	Oakover Formation
SRM202_WT	416.257	Alluvial Aquifer (TA/TD)



Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM45_D	417.839	Oakover Formation
SRM45_WT	417.68	Alluvial Aquifer (TA/TD)
SRM175_D	416.89	Oakover Formation
SRM175_WT	416.62	Alluvial Aquifer (TA/TD)

Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM92_D	417.298	Oakover Formation
SRM92_WT	417.05	Alluvial Aquifer (TA/TD)
SRM72_D	415.472	Oakover Formation
SRM72_WT	415.06	Alluvial Aquifer (TA/TD)



Sample Point	Top of Casing (mAHD)	Screened Aquifer
SRM48_D	418.118	Oakover Formation
SRM48_S	417.897	Alluvial Aquifer (TA/TD)
SRM52_D	418.412	Oakover Formation
SRM52_WT	417.951	Alluvial Aquifer (TA/TD)

Figure 13 Historical electrical conductivity for deep and shallow aquifer in saline reinjection areas (FMG, 2022)

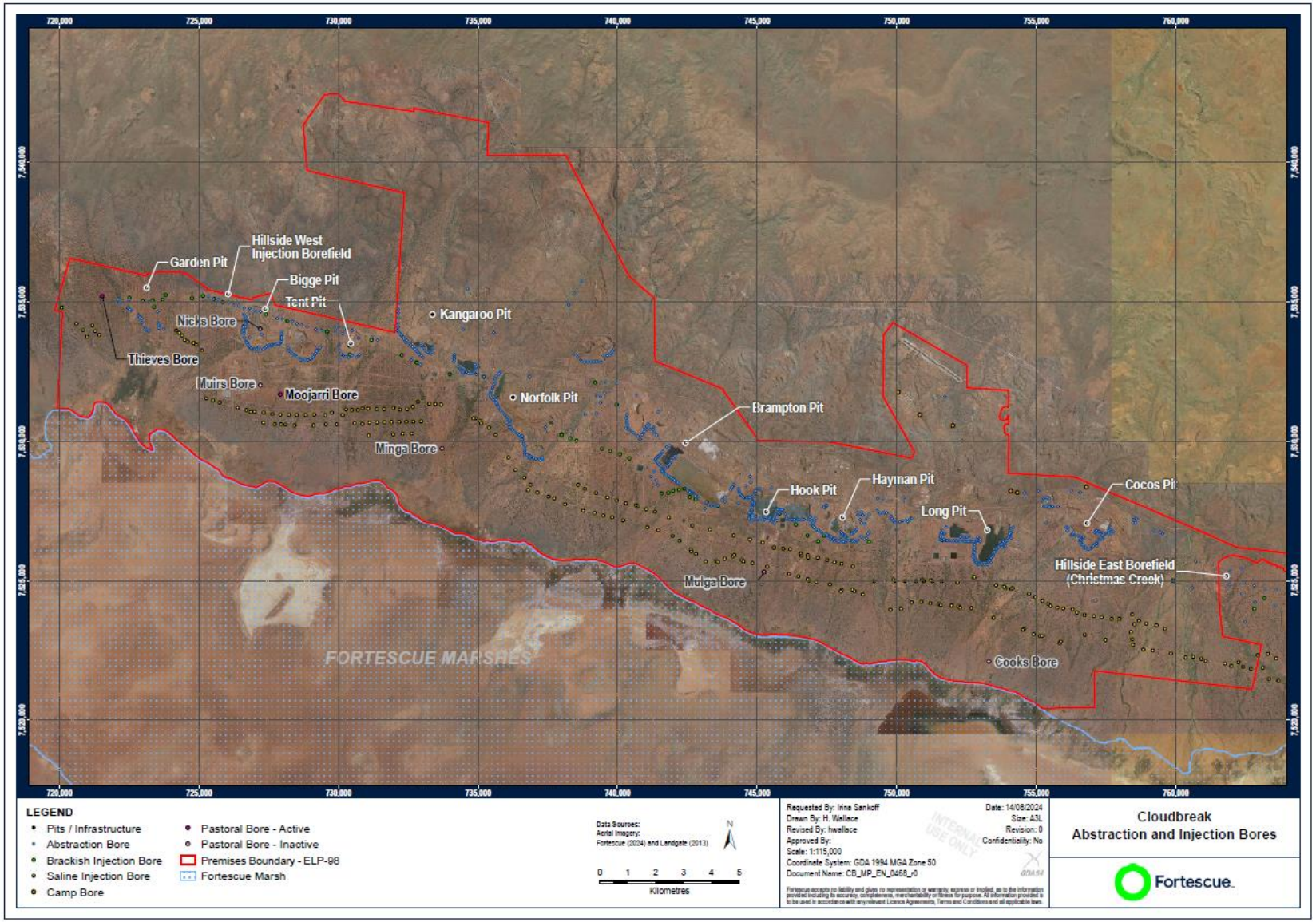


Figure 14 Pastoral bore locations

Appendix 3: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Cover page / prescribed premises boundary	Fortescue requests revision of the prescribed premises tenements to include: • Exploration Lease: E45/6960; • Miscellaneous Licence: L46/99 and L46/211; and • Mining Lease: M46/542.	Tenements E45/6960 and M46/542 are already within FMG's prescribed premises boundary and will be included on the licence. Amending the licence to include L46/99 and L46/211 would represent a significant expansion to the prescribed premises boundary. DWER recommends these tenements be included as part of a separate licence amendment (if prescribed activities are intended to take place within these additional tenements).
	Fortescue requests correction of administrative error on licence cover which includes duplication of L46/48 and mining lease M46/409.	The administrative errors have been corrected.
Condition 8	Fortescue requests removal of the constructed bores from the infrastructure column of Table 5. Bore requested for removal are: • SRP340, SRP342, SRP344, SRP348, SRP349, SPR350, SRP359 (for which an environmental compliance report was submitted on 21 December 2023 and compliance confirmation received by DWER on 26 February 2024); and • SRP319, SRP321, SRP322R, SRP323, SRP324, SRP325, SRP326, SRP327 (compliance documentation submitted to the department on 29 July 2024 – assessed by DWER as compliant, pending letter send out at time of writing).	The department has reviewed the compliance reports for these bores and determined the construction requirements have been met. These bores will be removed from the construction condition. For on-going operation of the bores via condition 12 Table 8, the department suggested the following amendment: *"Injection into the Oakover aquifer only at locations as depicted in the Maps titled The location of the brackish and saline water emission points in Schedule 1 of this Licence* *Downhole flow control valves, flow meters, pressure gauges must be operational"* The department queried the acceptability of this amendment with Fortescue, who responded with the following suggested wording: "Injection into the Oakover aquifer only **for Saline Injection Bores, and the Marra Mamba formation for Brackish**

Condition	Summary of Licence Holder's comment	Department's response
		Injection Bores only at locations depicted in the Maps titled *The location of the brackish and saline water emission points* in Schedule 1 of this Licence. **When connected to an active injection line,** downhole flow control valves, flow meters, pressure gauges must be maintained ~~**and remain operational**~~." Given that the current groundwater operating strategy specifies brackish reinjection into the Marra Mamba formation, the department considers the modified wording suggested by Fortescue provides additional clarity and will update the licence.

Appendix 4: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	☐				
Licence	☒	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☐	Current licence number:			
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☒	Current licence number:	L8199/2007/2		
		Relevant works approval number:		N/A	☐
Registration	☐	Current works approval number:		None	☒
Date application received		10 May 2024			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Chichester Metals Pty Ltd			
Premises name		Cloudbreak Iron Ore Mine			

Premises location	Mining Tenements M45/1126 (expiry 10 Jan 2027), M46/401, M46/404, M46/405, M46/356, M46/402, M46/410, M46/411, M46/357, M46/409, M46/453, M45/1128, M46/449, M46/452, M46/451, M46/454, M46/450, M45/1084, M45/1140, M45/1139, M45/1102 (2027), M45/1105 (2027), M45/1124 (2027), M45/1103, M45/1106 (2027), M45/1125, M45/1104, M45/1107, L46/48 (2027), L46/49 (2027), M45/1082, 45/1083 (2027), M45/1127, M45/1138, M45/1263, M45/1303, M46/403, M46/406, M46/407, M46/408, M46/409, M46/412, M46/413, M46/414, L46/52, L46/99, L46/46, L46/96, L46/64, L45/152, L46/47, L46/48, L46/51, L46/57, L46/62, L46/130 and Exploration Leases E45/2498, E46/590, E46/612, E45/2499, E45/2652, E45/2497
Local Government Authority	Shire of Ashburton and Shire of East Pilbara
Application documents	
HPCM file reference number:	DER2013/001073-2~9
Key application documents (additional to application form):	Attachment 1C – Authorisation to act as representative Attachment 3B – Figures Attachment 3B – Supporting Document Attachment 5 – Other approvals and consultation documentation Attachment 7 – Siting and location Attachment 10 – Fee calculator
Scope of application/assessment	
Summary of proposed activities or changes to existing operations.	Licence amendment • Category 5: revision of *Table 2 Containment infrastructure* to increase Brampton in-pit TSF maximum tailings elevation at deposition point from the existing RL 423 mAHD to the proposed 426.7 m AHD to release additional remaining TSF capacity; • Category 6: proposed change to *Table 1: Production or design capacity limits* for prescribed premises category 6 (mine dewatering) to increase the existing maximum groundwater reinjection limit from 150 GL/annum to the proposed 175 GL/annum (to align with EPA approval of the Cloudbreak Section 45C change to proposal [MS1010] on 9 February 2024] • Category 77: addition of this category to allow concrete batching/cements products manufacturing, up to 55,000 tonnes per annum for use on Fortescue projects as required, including outside the prescribed premises boundary.

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed / assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: processing or beneficiation of metallic or non-metallic ore	50,000,000 (assessed) tonnes per annual period	No changes to production/design capacity
Category 6: mine dewatering	150 GL per annual period	175 GL per annual period
Category 77: concrete batching or cement products manufacturing	55,000 tonnes per annual period	New category

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☒ No ☐	Ministerial statement No: MS 1010 Attachment 1 to MS 1010 – increase the existing groundwater and reinjection abstraction limit at the Cloudbreak mine from 150 GL/a to 175 GL/a – approved 9 February 2024 Managed under Part V ☐ Assessed (partially) under Part IV ☒
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☒ No ☐	Ministerial statement No: MS 1010 Attachment 1 to MS 1010 – increase the existing groundwater and reinjection abstraction limit at the Cloudbreak mine from 150 GL/a to 175 GL/a <u>Applicant also holds:</u> MS 899: Cloud break life of mine – approved 5 June 2012 MS962: Cloud break life of mine (statement to amend conditions) – approved 18 March 2014
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☒ No ☐	EPBC for life of mine expansion, but not relevant to this proposal.

		Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☐ General lease ☐ Expiry: Mining lease / tenement ☒ Expiry: A number of mining tenements specified checked and were active and registered with Chichester. Will request applicant confirm expiry for each of the tenements (either as RFI in or draft instrument). Other evidence ☐ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☐ N/A ☒	Approval: Planning approvals exempt under the *Mining Act 1978*
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	The applicant has indicated that "any clearing will be under MS 899"
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☒ No ☐	Application reference No: Licence/permit No: Groundwater licences: GWL166200(13) (exp 4 Oct 2026) GWL166354(12) (exp 4 Oct 2026) GWL177836(5) (exp 4 Oct 2026) Licence allocation: 150 GL per annum Aquifer: Pilbara Hamersley - Fortescue / Fractured Rock.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: Pilbara Surface Water Area & Pilbara Groundwater Area Type: RIWI Act Has Regulatory Services (Water) been consulted? Yes ☐ No ☐ N/A ☐ Regional office: North West

Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☐ N/A ☒
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Mining Act 1978* *Dangerous Goods Safety Act 2004*
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	Classification: N/A Date of classification: N/A