Licence Amendment

Attachment 3B Supporting Document

Cloudbreak Iron Ore Mine

L8199/2007/2

10 May 2024

100-RP-EN-9784

Rev: 0

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1 INTRODUCTION

1.1 Background

Fortescue Ltd (Fortescue) owns and operates multiple integrated iron ore mines and infrastructure projects in the Pilbara including:

- Chichester Hub (Cloudbreak and Christmas Creek)
- Western Hub (Eliwana and Solomon)
- Iron Bridge Magnetite Project
- Herb Elliott Port
- Fortescue rail network.

Fortescue has a target of zero carbon emissions by 2030 and is implementing a decarbonisation strategy to reduce Scope 1 and Scope 2 emissions from existing and future operations to net zero. Renewable energy projects are being developed to meet energy requirements across the business including solar, wind, green hydrogen, green ammonia, and battery electric solutions to decarbonise the mobile fleet and operational infrastructure.

The location of Fortescue operations in the Pilbara is shown in Figure 1.

Figure 1: Fortescue operations in the Pilbara

Cloudbreak Iron Ore Mine (Cloudbreak) is located approximately 120 km north of Newman, Western Australia within the Hillside and Mulga Downs pastoral leases and approximately 2.5 km north of the Fortescue Marsh, a wetland of national significance. Cloudbreak commenced iron ore production in 2008 and supplies approximately 50 million tonnes per annum (mtpa) of iron ore for shipment to Port Hedland via the Fortescue rail network.

Cloudbreak is approved under Part IV of the *Environmental Protection Act 1986* (EP Act) through Ministerial Statement (MS) 899 and licenced under Part V of the EP Act through Licence number L8199/2007/2. The locations of the Cloudbreak prescribed premises and associated mining tenements are shown in Figure 7 and Figure 8.

1.2 Purpose and scope

Fortescue proposes an amendment to Cloudbreak Licence L8199/2007/2 under s59B of the EP Act. The amendment is required to support the continuation of existing operations and the development of projects that contribute to delivering decarbonisation and diversification business objectives. The licence amendment will enable Fortescue to undertake the following activities within the prescribed premises boundary:

- Tailings deposition in the Brampton In-Pit Tailings Storage Facility (IPTSF) to a maximum elevation of Reduced Level (RL) 426.7 m AHD (metres above height datum) (increase of existing approved maximum elevation of RL 423 m AHD).
- Groundwater abstraction and reinjection up to a maximum 175 gigalitres (GL) per annum to align with the Cloudbreak section 45C change to proposal (MS 1010) approved on 9 February 2024 (increase of existing approved 150 mtpa).
- Concrete batching to produce up to 55,000 tonnes of concrete per annum for use by Fortescue projects located outside of the prescribed premises boundary (new approval for prescribed premises Category 77).

1.3 Approvals background

Cloudbreak has environmental approvals under Part IV and Part V of the EP Act and authorisation to take groundwater (abstraction and reinjection) under Section 5C of the *Rights in Water and Irrigation Act 1914* (RIWI Act).

Current environmental approvals for Cloudbreak are summarised in Table 1 below.

Table 1: Environmental Approvals

Legislation	Instrument	Summary
EP Act Part IV	MS 899	Statement that a proposal may be implemented. Date of Approval: 5 June 2012. Cloudbreak Life of Mine, Pilbara: The proposal includes the existing Cloudbreak iron ore mine and proposed expansion. The existing mine includes open pit strip mining, backfilling of pits, progressive rehabilitation and ore processing. The expansion includes increasing ore production, development of new pits and permanent waste landforms, the development of new infrastructure, additional dewatering and water disposal activities, an upgrade of the ore processing facility.
	MS 962	Statement to amend conditions applying to a proposal. Date of approval: 18 March 2014. Cloudbreak Life of Mine Project: The Cloudbreak iron ore mine project includes open pit strip mining, development of new pits and permanent waste landforms, backfilling of pits, progressive rehabilitation and ore processing, development of infrastructure, dewatering and water disposal activities.
	MS 1010	Statement that a proposal may be implemented. Date of approval: 4 August 2015. Increase in abstraction and reinjection at Cloudbreak mine: Increase in the volume of groundwater abstraction from 100 Gigalitres per annum (GL/a) to 150 GL/a and reinjection from 95 GL/a to 150 GL/a at the existing Cloudbreak Life of Mine proposal (described in Ministerial Statement No. 899 and amended by Statement 962). Section 45C Change to proposal. Date of approval: 9 February 2024. Attachment 1: Increase the existing groundwater and reinjection abstraction limit at the Cloudbreak mine from 150 GL/a to 175 GL/a.

EP Act Part V	L8199/2007/2	Cloudbreak Iron Ore Mine. Date of amendment: 21 July 2023. Expiry date: 3 February 2032. Prescribed premises category description (assessed production / design capacity): Category 5: Processing or beneficiation of metallic or non-metallic ore (50,000,000 tonnes per Annual Period). Category 6: Mine dewatering (Maximum of 150,000,000 tonnes per Annual Period (reinjected)) Category 52: Electric power generation (50.6 megawatts) Category 54: Sewage facility (812 cubic metres per day) Category 57: Used tyre storage (2,000 tyres) Category 64: Class II putrescible landfill site (10,000 tonnes per Annual Period) Category 73: Bulk storage of chemicals, etc. (7,700.5 cubic metres)
RIWI Act Section 5C	GWL166200(13) GWL166354(12) GWL177836(5)	Groundwater Licences. Issue date: 4 February 2022. Expiry date: 5 October 2026. Licence allocation: 150,000,000 kilolitres per annum Aquifer: Pilbara Hamersley - Fortescue / Fractured Rock.

1.4 Prescribed Premises

The Cloudbreak Licence L8199/2007/2 includes seven prescribed premises categories under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations). Environmental risks associated with the prescribed premises categories have been assessed as part of the original and subsequent works approvals and licence amendments.

Table 2 shows the categories relevant to this licence amendment and the proposed changes in **bold text**.

Table 2: Prescribed Premises Categories

Prescribed Premises Category	Existing production or design capacity	Proposed change	New production or design capacity
Category 6 Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore	Maximum of 150,000,000 tonnes (150 GL) per Annual Period (reinjected)	**Increase of 25,000,000 tonnes (25 GL) per annual period (reinjected)**	**~~150,000,000~~ 175,000,000 tonnes (175 GL) per Annual Period (reinjected)**
Category 77 Concrete Batching or cement products manufacturing	Not a category under current Cloudbreak Licence L8199/2007/2	**New prescribed premises category added to Cloudbreak Licence L8199/2007/2**	**55,000 tonnes per annum**

1.5 Stakeholder Consultation

Fortescue engages with relevant internal and external stakeholders regarding Cloudbreak operations on an ongoing basis to meet the following objectives:

- Inform stakeholders about potential risks and impacts to the environment and social values and describe the outcomes of consultations to the Proposal.
- Establish relationships with key stakeholders that enable ongoing dialogue through the implementation and regulation of the Cloudbreak mine life.

Formal stakeholder engagement was not undertaken specifically for this licence amendment application based on the scope of the changes, with consultation completed for the approved Cloudbreak section 45C change to proposal (MS 1010) considered adequate.

1.6 Applicant details

The applicant and occupier of the premises for this licence application is:

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Australian Company Number: 002 594 872
Australian Business Number: 57 002 594 872

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2 PROPOSED LICENCE AMENDMENTS

Fortescue requests an amendment to the existing Cloudbreak Iron Ore Mine Licence L8199/2007/2 to support ongoing operations and decarbonisation objectives. The proposed changes include:

- Proposed revision to *Table 2: Containment infrastructure* to increase the Brampton IPTSF maximum tailings elevation at deposition point from the existing RL 423 m AHD to the proposed RL 426.7 m AHD to realise additional remaining TSF capacity (Section 3).

- 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 facilitate continued mining operations and alignment with EPA approval of the Cloudbreak Section 45C change to proposal (MS 1010) on 9 February 2024 (Section 4).

- Addition of a new Category 77 (Concrete batching or cements products manufacturing) to the operating licence under *Table 1: Production or design capacity limits*), to allow for the construction and operation of a concrete batching plant (CBP) within the Cloudbreak prescribed premises boundary. Up to 55,000 tonnes per annum (tpa) of concrete will be produced from the proposed CBP for use on Fortescue projects as required (outside of the Cloudbreak prescribed premises boundary) including but not limited to the Pilbara Energy Connect (PEC) project (Section 5).

3 BRAMPTON IN-PIT TSF MAXIMUM TAILINGS ELEVATION

3.1 Background

The Brampton IPTSF is the primary storage facility for tailings produced from Cloudbreak operations (up to 50 mtpa) approved under Licence L8199/2007/2. The location of the Brampton IPTSF is shown in Figure 9. Fortescue was originally permitted to deposit tailings via a single open-ended disposal point (spigot) positioned on the western side of the haul ramp. Subsequent tailings deposition modelling indicated that if deposition continued from a single point, the Brampton IPTSF would reach maximum capacity (elevation of RL 423 m AHD) before the estimated end of design life. A Licence amendment approved on 21 July 2023 allows for an increase in the life of the Brampton IPTSF and provides operational flexibility by permitting the installation of additional spigots to enable tailings deposition to be rotated through multiple open-ended disposal points without an overall volumetric change.

The Brampton IPTSF is currently receiving tailings through a single operational spigot. Using data from July 2023, maximum capacity was projected to be reached in August 2024 (approximate) if deposition continued using a single spigot to the currently approved maximum tailings elevation of RL 423.0 m AHD (assuming a tailings density of 1.11 t/m^3). This was based on a remaining volume of approximately 32.3 Mm^3 (inclusive of ponded water), which equates to an approximate capacity of 35.9 Mt, and factors in the maximum allowable tailings elevation and the tailings rate of rise.

A bathymetric survey of the Brampton IPTSF was conducted in August 2023 to determine the volume of deposited tailings and ponded water and reconcile settled tailings densities and achieved subaqueous (below water) beach slopes. Information from the bathymetric survey has been used for updated deposition modelling to evaluate the accuracy of the August 2024 maximum capacity date and provide a clearer representation of the remaining capacity within the IPTSF. Deposition modelling included assessment of the predicted tailings deposition from a single spigot and from multiple spigots, taking into consideration the required storm storage and freeboard requirements.

3.2 Proposal

Fortescue proposes to optimise tailings storage for Cloudbreak operations by realising additional remaining capacity within the Brampton IPTSF. This will be achieved by increasing the elevation of the existing single spigot (Spigot 1) used for tailings deposition and raising the maximum tailings elevation from RL 423.0 m AHD to RL 426.7 m AHD (0.3 m below the pit crest). This approach (Scenario 1) has been selected based on the latest deposition modelling undertaken by Fortescue and is predicted to utilise approximately 73% of remaining capacity within the IPTSF and provide storage capacity up to October 2027, without requiring the use of additional spigots.

No changes to emissions and discharge locations are required as tailings will be contained within the existing approved pit and spatial area. All existing management controls to minimise any potential environmental risks associated with tailings emissions and discharges are still applicable and relevant for this proposed amendment.

The requested amendment to Table 2 of L8199/2007/2 is highlighted in **bold text** in Table 3.

Table 3: Containment infrastructure

Storage vessel or compound	Material	Requirements
TSFs	Tailings	• 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; and • Visual markers installed at the deposition ramp for freeboard monitoring. <u>Brampton In-Pit TSF</u> • Maximum operating level of Reduced Level 418.1 m; and • Maximum tailings elevation at deposition point Reduced Level ~~423 m~~ **<u>426.7 m</u>**. Tailings Deposition Pipeline • Multiple disposal points; and • Deposition pipe extended at least 10-15 m away from the northern boundary wall. Tailings Delivery Pipelines • Constructed of HDPE and/or steel; • All pipeline routes to follow existing road networks and pipeline corridors, where possible; • Flow meters installed at the start and near the end of the deposition pipelines (or as close to the end as operationally possible); and • Pressure sensors installed along deposition pipelines.

3.3 Deposition modelling

3.3.1 Summary

Deposition modelling was undertaken to quantify the remaining capacity of the Brampton IPTSF based on information gained from the bathymetric survey, including how subaqueous beach slope and achieved settled densities have altered since 2021. Modelling involved the evaluation of the current deposition scenario and three alternative scenarios to determine the most viable method to safely extend the life of the Brampton IPTSF. A summary of the modelling scenarios is provided in Table 4.

- Base case (Spigot 1 only) - continue operation of the existing spigot (Spigot 1) until the current maximum tailings elevation level of RL 423.0 m AHD is reached. The base case scenario utilises approximately 49% of remaining capacity, providing storage up to September 2026.

- Scenario 1 (Spigot 1 with maximum tailings level increase) - increase elevation of Spigot 1 by 3.7 m and raise maximum tailings elevation from RL 423.0 m AHD to RL 426.7 m AHD. Scenario 1 utilises approximately 73% of remaining capacity, providing storage up to October 2027.

- Scenario 2 (Spigot 1 with maximum tailings level increase and Spigot 2) - increase elevation of Spigot 1, add a second spigot (Spigot 2) and raise maximum tailings elevation to RL 426.7 m AHD. Scenario 2 utilises approximately 96% of remaining capacity, providing storage up to July 2030.

- Scenario 3 (Spigot 1 with maximum tailings level increase, Spigot 2 and Spigot 3) - increase elevation of Spigot 1, add a second spigot (Spigot 2) and raise maximum tailings elevation to RL 426.7 m AHD. Add a third spigot (Spigot 3) with maximum tailings elevation of RL 425.0 m AHD (to maintain storm storage). Scenario 3 utilises approximately 100% of remaining capacity, providing storage up to March 2031.

Spigot locations are shown in Figure 2. Spigot 4 is no longer required based on the revised beach profiles and densities associated with the updated deposition modelling.

Table 4: Summary of modelling scenarios and anticipated TSF capacity

Modelling scenario	Volume (m^3)	Tonnage (t)	Available capacity utilised (%)	Indicative Brampton IPTSF capacity date
Base Case	17,075,384	22,872,835	49	September 2026
Scenario 1	**25,495,597**	**34,561,263**	**73**	**October 2027**
Scenario 2	33,414,188	45,767,636	96	July 2030
Scenario 3	34,706,970	47,619,606	100	March 2031

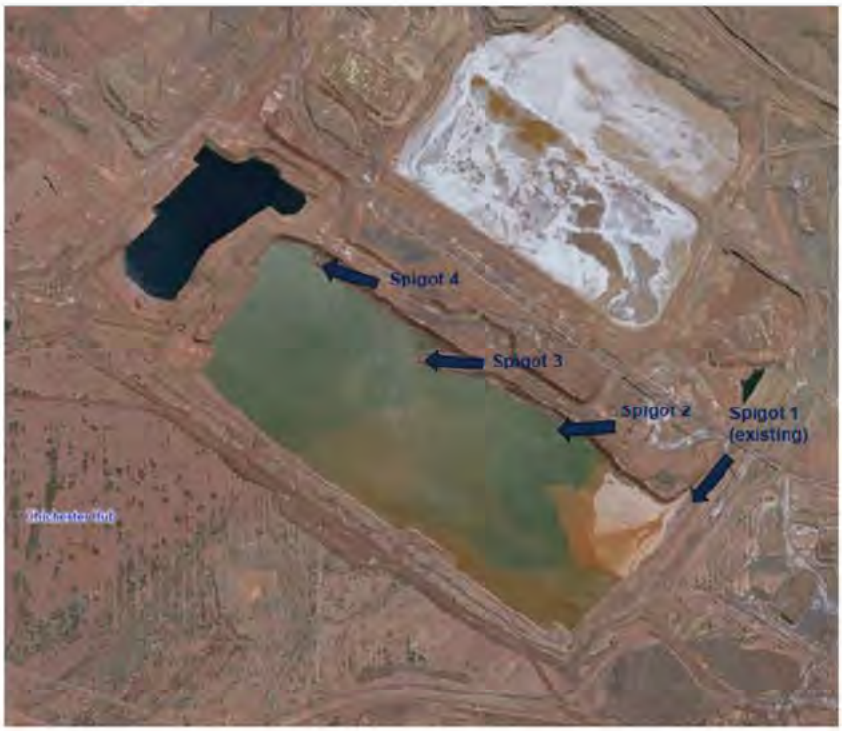

Figure 2: Brampton IPTSF spigot locations

3.3.2 Modelling criteria

Deposition modelling undertaken by Fortescue to quantify the remaining capacity of the Brampton IPTSF was based on the key modelling criteria provided in Table 5.

Table 5: Key modelling criteria

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

3.3.3 Base case – Spigot 1

The Base case scenario models the continued deposition of tailings using the existing single spigot (Spigot 1) until the current maximum tailings elevation level is reached (RL 423.0 m AHD).

A total tailings deposition of 17,075,384 m^3 (22,872,835 t) is achieved, with the split between subaerial and subaqueous storage provided in Table 6.

Table 6: Base case subaerial and subaqueous tailings

Subaerial volume (m^3)	Subaqueous volume (m^3)	Subaerial tonnage (t)	Subaqueous tonnage (t)
4,619,745	12,455,639	6,929,617	15,943,218

The Base case scenario results in approximately 49% of the remaining overall capacity being used, with this capacity reached by September 2026.

The modelled Brampton IPTSF surface and pond under the Base case scenario is provided in Figure 3.

Figure 3: Base case model surface and pond

3.3.4 Scenario 1 – Spigot 1 with level increase

Scenario 1 models the deposition of tailings using the existing single spigot (Spigot 1) with an increased elevation of 3.7 m and a raised maximum tailings elevation (RL 426.7 m AHD).

A total tailings deposition of 25,495,597 m^3 (34,561,263 t) is achieved, with the split between subaerial and subaqueous storage provided in Table 7.

Table 7: Scenario 1 subaerial and subaqueous tailings

Subaerial volume (m^3)	Subaqueous volume (m^3)	Subaerial tonnage (t)	Subaqueous tonnage (t)
8,758,628	16,736,969	13,137,942	21,423,321

Scenario 1 results in approximately 73% of the remaining overall capacity being used, with this capacity reached by October 2027. The increased elevation of the spigot results in a capacity increase of 24% over the Base case scenario.

The modelled Brampton IPTSF surface and pond under Scenario 1 is provided in Figure 4.

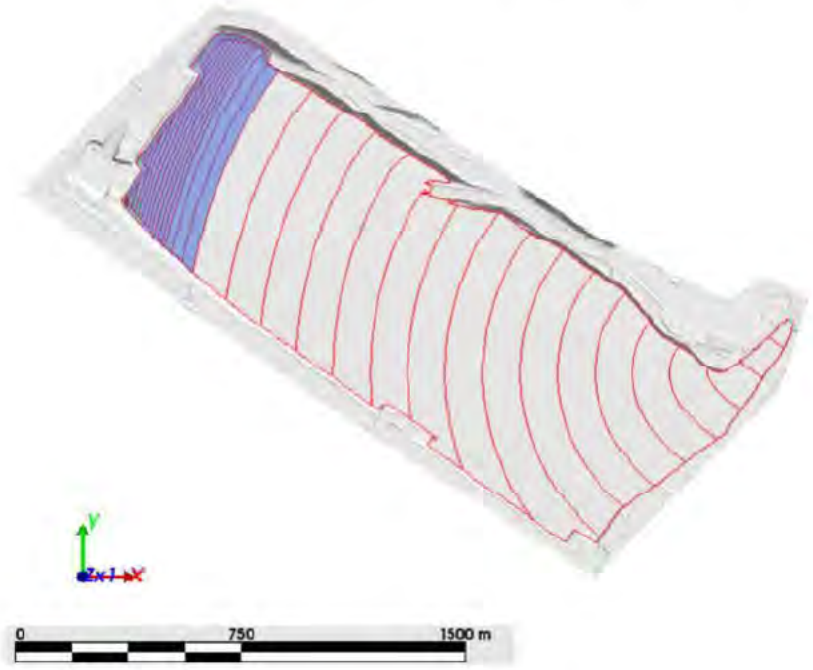

Figure 4: Scenario 1 model surface and pond

3.3.5 Scenario 2 – Spigot 1 with level increase and Spigot 2

Scenario 2 models the deposition of tailings using the existing single spigot (Spigot 1) with an increased elevation of 3.7 m, the addition of a second spigot (Spigot 2) and a raised maximum tailings elevation (RL 426.7 m AHD).

A total tailings deposition of 33,414,188 m^3 (45,767,636 t) is achieved, with the split between subaerial and subaqueous storage provided in Table 8.

Table 8: Scenario 2 subaerial and subaqueous tailings

Subaerial volume (m^3)	Subaqueous volume (m^3)	Subaerial tonnage (t)	Subaqueous tonnage (t)
13,624,884	19,789,304	20,437,326	25,330,310

Scenario 2 results in approximately 96% of the remaining overall capacity being used, with this capacity reached by July 2030. The inclusion of the additional spigot results in a capacity increase of 23% over Scenario 1.

The modelled Brampton IPTSF surface and pond under Scenario 2 is provided in Figure 5.

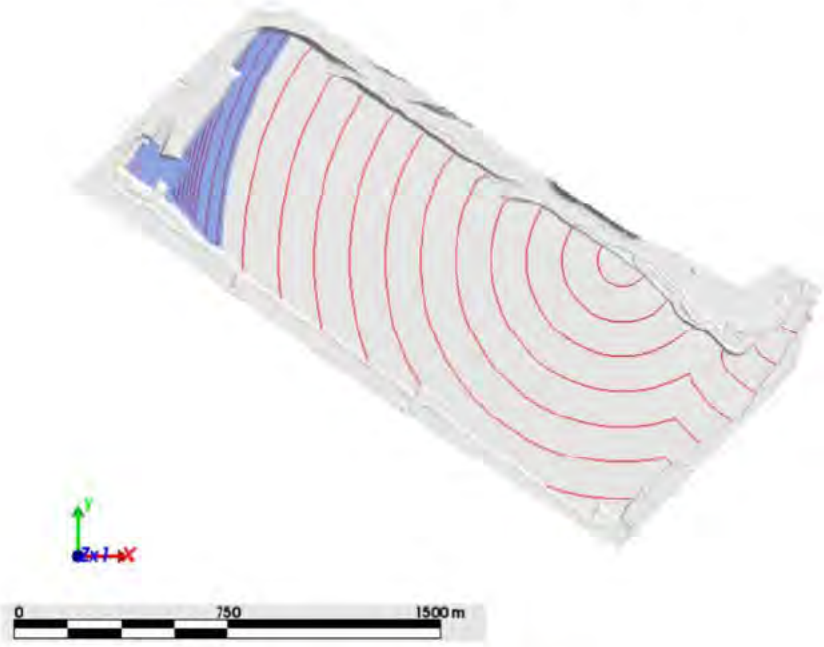

Figure 5: Scenario 2 model surface and pond

3.3.6 Scenario 3 – Spigot 1 with level increase, Spigot 2 and Spigot 3

Scenario 3 models the deposition of tailings using the existing single spigot (Spigot 1) with an increased elevation of 3.7 m, the addition of a second spigot (Spigot 2) and a raised maximum tailings elevation (RL 426.7 m AHD). A third spigot (Spigot 3) is added with a maximum elevation of RL 425.0 m AHD to maintain storm storage.

A total tailings deposition of 34,706,970 m^3 (47,619,606 t) is achieved, with the split between subaerial and subaqueous storage provided in Table 9.

Table 9: Scenario 3 subaerial and subaqueous tailings

Subaerial volume (m^3)	Subaqueous volume (m^3)	Subaerial tonnage (t)	Subaqueous tonnage (t)
14,521,286	20,185,684	21,781,929	25,837,677

Scenario 3 results in approximately 100% of the remaining overall capacity being used, with this capacity reached by March 2031. The inclusion of the additional spigot results in a capacity increase of 4% over Scenario 2.

The modelled Brampton IPTSF surface and pond under Scenario 3 is provided in Figure 6.

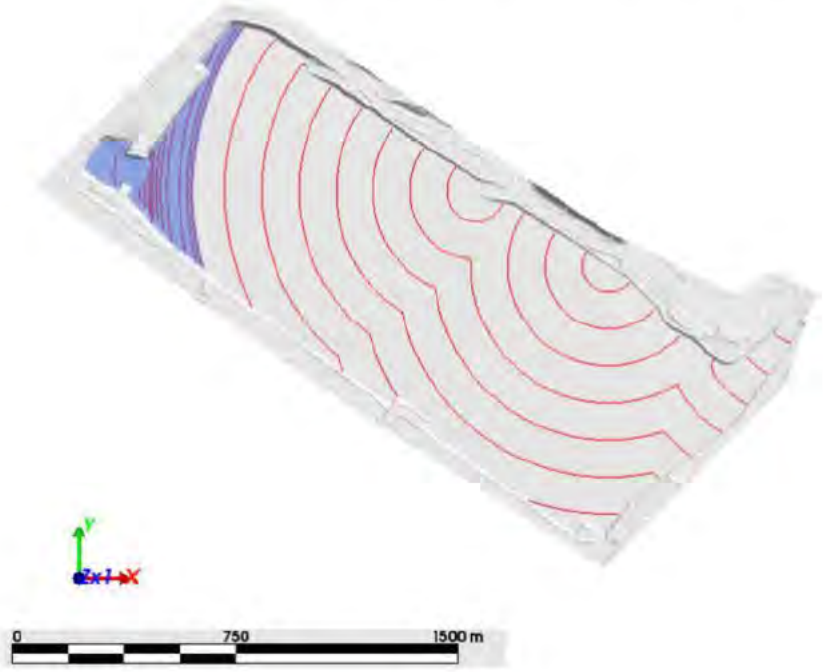

Figure 6: Scenario 3 model surface and pond

4 GROUNDWATER ABSTRACTION AND REINJECTION

4.1 Background

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 injection under a Managed Aquifer Recharge (MAR) scheme.

Fortescue is authorised to abstract and reinject up to 150 GL/annum of groundwater at Cloudbreak under Prescribed Premises Category 6 in the current Cloudbreak Licence L8199/2007/2. An increase to the annual reinjection limit of 25 GL/annum (to 175 GL/annum) is proposed to facilitate dewatering of new mining pits, and existing mining pits where a cessation of dewatering resulted in a rebound of groundwater levels into the mine void. Extensive studies have been conducted to sufficiently conclude that the proposed increase in groundwater abstraction to support safe and sustainable mining operations can be undertaken without additional environmental risk.

Fortescue can abstract and reinject up to 175 GL/annum of groundwater at Cloudbreak under the EP Act 1986. The increase from the previously authorised extent of 150 GL/annum was approved by the EPA through a section 45C change to proposal on 9 February 2024, as described in MS 1010 Attachment 1, Table 2. A temporary cessation of mine dewatering of inactive mining pits was approved on 6 June 2019 under MS 899 Attachment 6. Monitoring and management of groundwater level changes from the injection of surplus water is required under MS 962 Conditions 7-1 and 7-2.

Fortescue can abstract and reinject up to 150 GL/annum at Cloudbreak under section 5C of the RIWI Act through licences to take water GWL166200(13), GWL166354(12) and GWL177836(5) issued by the Department of Water and Environmental Regulation (DWER). A water licencing amendment will be submitted to increase the abstraction and reinjection limits to align with the approved Cloudbreak section 45C change to proposal (MS 1010) and the proposed Cloudbreak Licence L8199/2007/2 amendment.

4.2 Proposal

Fortescue proposes to amend the production or design capacity of prescribed premises category 6 mine dewatering at Cloudbreak from 150 GL/annum to 175 GL/annum. The increase of 25 GL/annum enables safe and sustainable groundwater management aligned with the approved Cloudbreak section 45C change to proposal approving groundwater abstraction and reinjection up to 175 GL/annum (MS 1010).

The groundwater is to be abstracted from new and existing mining pits and injected back into the Oakover aquifer through the MAR program to maintain water levels at the Fortescue

Marsh. The MAR program has been implemented for the last 10 years and during this time there have been no consistent Level 1 or Level 2 drawdown or mounding exceedances at the key marsh monitoring bores (excluding exceedances after high rainfall events that are not directly attributed to Cloudbreak mining operations).

The proposed increase in the abstraction limit will have minimal groundwater drawdown (<1 m) at the fringe of the Fortescue Marsh as predicted by groundwater modelling and shown in Figure 10. Any potential drawdown from increased abstraction is expected to be offset by the reinjection of abstracted water back into the Oakover aquifer. Existing approved abstraction and reinjection infrastructure will be utilised to reduce the risk of additional potential environmental impacts.

4.3 Potential Environmental impacts

The Environmental Protection Agency (EPA) recognised 14 environmental factors arranged under five themes (Sea, Land, Water, Air and People) to provide a systematic approach for the environmental impact assessment undertaken to support the approval granted.

The environmental factors relevant to the proposed 25 GL increase in groundwater abstraction and reinjection are:

- Impacts to flora and vegetation (biological diversity and ecological integrity).
- Impacts to inland waters (groundwater quality).

4.4 Impacts to flora and vegetation

The EPA *Flora and Vegetation* factor under the *Land* theme has the objective "*To protect flora and vegetation so that biological diversity and ecological integrity are maintained".*

The Cloudbreak Vegetation Health Monitoring and Management Plan (100-PL-EN-0019) required under MS 899 Condition 6 is being implemented to minimise potential impacts to flora and vegetation. Vegetation health monitoring has been undertaken since August 2011 and shows there have been no significant changes to vegetation health from the operational abstraction and reinjection of groundwater or groundwater management activities.

Changes to conservation significant vegetation communities are not predicted to occur as the health of these communities is not dependent on access to the Oakover aquifer and any potential groundwater drawdown is likely to have negligible impact.

4.5 Impacts to groundwater quantity and quality

The EPAs *Inland Waters* factor under the *Water* theme has the objective "*To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*".

No additional detrimental impacts to groundwater quality and quantity are expected to occur from increasing abstraction and reinjection from 150 GL/annum to 175 GL/annum based on groundwater modelling completed to support the Cloudbreak section 45C change to proposal approved on 9 February 2024 (MS 1010). The modelling predicts minimal drawdown across all monitoring locations and no mounding of the water table above baseline conditions.

Water levels at the Fortescue Marsh will continue to be monitored through the MAR program to efficiently manage saline reinjection and maintain water levels that prevent any potential drawdown or mounding impacts.

4.5.1 Groundwater level drawdown and mounding

Groundwater modelling conducted to support the increase in abstraction and reinjection limit indicates that the water table drawdown for 2021 to 2025 will be within the drawdown outlined in the original Cloudbreak Environmental Review Document (ERD) assessment. Minimal drawdown (<1 m) is predicted at the Fortescue Marsh fringe, which is within natural seasonal variations.

Predictive hydrographs from the monitoring bores used in the modelling indicate limited drawdown across all monitoring locations, with water levels following a natural rise and fall in line with rainfall recharge and losses by evaporation. Any predicted drawdown is expected to be offset through reinjection of abstracted water from dewatering of new and existing mine pits into the Oakover aquifer.

Since the inception and operation of the MAR program at the Cloudbreak Mine (approximately 13 years) there have been no Class 1 or Class 2 water table triggers as a result of mining operations. The only exceedances of note at the Fortescue Marsh fringe have been associated with direct recharge to the water table when the Fortescue Marsh is inundated with water from significant rainfall events.

Groundwater injection at Cloudbreak is predicted to offset groundwater drawdown without water table mounding occurring. Based on the current injection strategy and experience with the MAR scheme, over-pressurisation of the Oakover aquifer and inundation of vegetation roots is not expected.

4.6 Summary

Management of groundwater abstraction and reinjection at Cloudbreak is based on extensive studies undertaken to understand the potential impact of mine dewatering on the surrounding environment. Groundwater modelling indicates that the proposed increase in mine dewatering from 150 GL/annum to 175 GL/annum to support safe and sustainable mining operations and align with the approved Section 45C change to proposal (MS 1010), will not increase the risk of environmental impact above the level already identified and currently being managed.

5 CONCRETE BATCHING

5.1 Background

Fortescue is progressing several green energy initiatives as part of a company-wide decarbonisation strategy including the construction and operation of solar farms, wind farms, transmission lines, substations and battery installations to help meet the energy requirements of operations.

Decarbonisation projects located near Cloudbreak will require a concrete batch plant (CBP) to supply concrete for construction purposes.

5.2 Proposal

Fortescue proposes to include a new Prescribed Premises Category 77 in the amended Cloudbreak Licence L8199/2007/2 to permit concrete batching and supply of concrete for the Cloudbreak Mine and outside the Cloudbreak Mine prescribed premises boundary for other Fortescue projects (as required). The proposed CBP will be constructed and operated within mining tenements M45/1125, M45/1124, M46/411, M46/410 as required, and has the capacity to produce up to 55,000 tonnes of concrete per annum for use by Fortescue projects outside of the prescribed premises boundary. The proposed location of the Cloudbreak CBP is shown in Figure 9.

Fortescue requests provision in the licence to facilitate minor variations to CBP design and operation if changes to infrastructure and processes are immaterial and do not increase the environmental, health, and public amenity risk.

5.3 Concrete Batching Plant

The Cloudbreak CBP will be a mobile batch plant with an indicative maximum capacity of 60 cubic metres per hour, producing up to 55,000 tonnes of concrete per annum. The CBP will use a computer-controlled batching system (CommandAlkon or similar) and have the capability to record batching quantities.

The CBP will be designed, constructed, and operated in accordance with the requirements of the *Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998*.

5.3.1 Design

Key components of the CBP infrastructure include:

- Self-contained batch plant with vertical cement silo, horizontal cement silo, cement weigh hopper and twin aggregate weigh bins

- Aggregate, admixtures, sand (stockpiles)
- Wedge pit
- Chiller plant
- Wash out pit
- Workshop and Laboratory
- Generator and reticulated power
- Fuel storage
- Communications
- Batch room
- Site administration office and ablutions

5.3.2 Operation

Operation of the Cloudbreak CBP will require key inputs of water, power, and fuel and involve weighing, loading, and mixing of materials to produce a homogenous concrete output.

The key processes associated with the CBP will include the following functional areas:

- Aggregate storage and cooling
- Concrete batching
- Chilled water supply
- Cement supply and transfer
- Waste and water management
- Site services
- Admixture storage and delivery
- Water supply
- Fuel supply
- Power generation

Dry materials required for concrete production will be sourced from offsite, with cement transported to the CBP using Road Tanker vessels and Prime Mover and aggregate and sand sourced from local quarries within the Pilbara region (to be determined by the selected contractor). Materials will be transported by a Front-End Loader (FEL) from their designated storage location 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 RIWI Act and 5C groundwater licencing 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 Cloudbreak power supply & 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 sound enclosed.

There is sufficient capacity within the current Cloudbreak Licence L8199/2007/2 for the expected peak power and fuel requirements of the proposed CBP under prescribed premises Category 52 Electric power generation (50.6 megawatts) and Category 73 Bulk storage of chemicals (7,700.5 cubic metres).

6 SITING AND LOCATION

The activities proposed in this licence amendment will be undertaken within the existing Cloudbreak Licence L8199/2007/2 prescribed premises boundary. Local environmentally sensitive receptors and aspects were assessed based on *Guidance Statement: Environmental Siting* (DWER 2016) and are shown in Figure 11.

An assessment of the potential sources, pathways and receptors and corresponding management measures to minimise environmental harm has been completed. The potential environmental impacts from the proposed activities are not expected to differ from those identified in previous licence amendments, consistent with the vegetation communities, conservation significant flora and fauna habitat and land system maps shown in Figures 12 to 14.

6.1 Sensitive Receptors

There are no known sensitive land uses within the vicinity of the prescribed premises boundary. The nearest sensitive receptors are Marillana Homestead and Bamboo Springs, located approximately 31.5 km and 34.8 km away respectively. The closest town is Newman, located approximately 120 km from the Prescribed Premises Boundary.

The location of environmentally sensitive receptors and aspects in the vicinity of the prescribed premises boundary are shown in Table 10. The siting and location assessment has determined the proposed activities to be controlled, low risk and remote regarding the proximity to sensitive receptors.

Table 10: Environmentally sensitive receptors and aspects

Type / classification	Description	Location	Additional controls
Environmentally Sensitive Areas[1]	ESA 3672	Outside the prescribed premises boundary (~3.3 km from proposed activities) Refer to Figure 11	None proposed
Threatened Ecological Communities	Ethel Gorge aquifer stygobiont community	Outside the prescribed premises boundary (~118.6 km from proposed activities) Refer to Figure 11	None proposed

Threatened Ecological Communities	Themeda grasslands on cracking clays (Hamersley Station, Pilbara)	Outside the prescribed premises boundary (~150 km from proposed activities)	None proposed
Threatened and/or priority fauna	Night Parrot (Pezoporus occidentalis)	Within the prescribed premises boundary Refer to Figure 13	None proposed
Threatened and/or priority flora	Themeda sp. Hamersley Station (Priority 3)	Within the prescribed premises boundary Refer to Figure 13	None proposed
Threatened and/or priority flora	Goodenia sp. East Pilbara (Priority 3)	Within the prescribed premises boundary Refer to Figure 13	None proposed
Aboriginal and other heritage sites [2]	GOV DAA Places	Outside and within the prescribed premises boundary	None proposed
Public drinking water source areas [3]	Priority 1 PDWSA	Outside the prescribed premises boundary (~83.9 km from proposed activities)	None proposed
Rivers, lakes, oceans, and other surface water bodies	Fortescue River	Outside the prescribed premises boundary (~1.9 km from proposed activities)	None proposed
Acid sulfate soils	Moderate to low risk ASS	Outside the prescribed premises boundary (~120.4 km from proposed activities)	None proposed
Other	Karijini National Park Conservation Reserve	Outside the prescribed premises boundary (>100 km from proposed activities)	None proposed

1 Environmentally Sensitive Areas declared under the Environmental Protection (Environmentally Sensitive) Notice 2005. For further information, refer to DWER's website ("Environmentally Sensitive Areas").

2 Refer to the Department of Planning, Lands and Heritage website for further information about Aboriginal heritage and other heritage sites.

3 Refer to Water Quality Protection Note No.25: Land use compatibility tables for public drinking water source areas for further information.

7 RISK ASSESSMENT

The proposed activities at Cloudbreak detailed in Sections 3 to 5 have been assessed to identify potential environmental impacts from emissions and discharges and the management controls required to minimise risk. The relevant environmental factors are:

- Flora and Vegetation
- Groundwater
- Dust
- Surface water
- Chemicals and Hydrocarbons
- Waste
- Noise

7.1 Flora and vegetation

Potential impacts to flora and vegetation from Cloudbreak activities are managed through the implementation of the Vegetation Health Monitoring and Management Plan (100-PL-EN-1020) in accordance with MS 899 Condition 6.

A series of environmental management objectives have been developed to mitigate potential environmental impacts on vegetation health from Fortescue's activities (exploration, construction, operation, and decommissioning) including:

1. Establishing the potential direct and indirect impacts on conservation significant flora and vegetation within Fortescue controlled sites.
2. Establishing management strategies to minimise potential impacts on conservation significant flora and vegetation.
3. Developing and implementing a vegetation health monitoring program to detect impacts on the conservation values of significant flora and vegetation.

Management measures specified in the Vegetation Health Monitoring and Management Plan (100-PL-EN-1020) to manage direct and indirect risks to flora and vegetation from the proposed activities include:

- Monitoring and management of changes in groundwater levels (groundwater mounding or drawdown) outside of the Mine Development Envelope.

- Designing and locating infrastructure to minimise disruption to natural surface water flows in areas that support conservation significant flora and vegetation.

- Controlling dust emissions to minimise deposition on conservation significant flora and vegetation.

7.2 Groundwater

Potential impacts to groundwater from Cloudbreak activities are managed in accordance with MS 899, MS 962, MS 1010, GWL166200(13), GWL166354(12), GWL177836(5) and the Cloudbreak Groundwater Operating Strategy (CB-PH-HY-0009). An amendment to increase groundwater abstraction and reinjection up to 175 GL/annum will be submitted under Section 5C of the RIWI Act to align with the approved Cloudbreak section 45C change to proposal (MS 1010).

Groundwater abstraction will continue to be undertaken to support mining operations, with reinjection via the injection bores fringing the Marsh to maintain water levels within requirements. The potential impact of the proposed increase in groundwater abstraction and injection at Cloudbreak has been assessed through groundwater studies and modelling and is predicted to be within the existing scope approved under MS 899, MS 962 and MS 1010.

7.3 Surface water

Potential impacts to surface water from Cloudbreak activities are managed through the implementation of the Surface Water Management Plan (100-PL-EN-1015) in accordance with MS 899 Condition 11.

The proposed Cloudbreak CBP has the potential to impact surface water, primarily from stormwater drainage and operational discharges. Specific management measures to control surface water impacts include:

- Locating the CBP away from major surface water bodies to minimise disruption of local surface water flows.

- Using existing stormwater management infrastructure where practicable.

- Installing diversion structures such as bunds, channels and drains to separate and divert clean surface water flows around CBP work areas and stockpiles.

- Establishing erosion controls such as sediment basins, bunding and vegetated batters to reduce surface water sediment and maintain water quality.

- Collecting stormwater drainage, wash-down water and spillages from CBP work areas to designated collection points and sedimentation traps for treatment prior to re-use or

release to the surrounding environment. The concrete load bay and pad area design includes a wedge pit for first flush and washout pit.

- Meeting relevant water quality limits specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000) and *Water quality protection note (WQPN) 68 - Mechanical Equipment Washdown.*

7.4 Dust

Potential impacts of dust emissions from Cloudbreak activities are managed through the implementation of the Dust Management Plan (IO-PL-EN-0001). Management measures to control dust emissions and minimise potential impacts to surrounding land users and the environment include:

- Informing all personnel and contractors working in the project area of their responsibilities concerning dust management.
- Minimising vegetation clearing and vegetation disturbance.
- Developing and implementing dust suppression measures where necessary (e.g., water carts, vehicle speed restrictions) to minimise the potential for dust deposition on vegetation or a reduction in amenity.

The proposed Cloudbreak CBP has the potential to produce dust emissions, primarily from the aggregate storage area (stockpiles). Specific management measures to control dust emissions include:

- 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.

7.5 Chemical and Hydrocarbon Management

Potential impacts of chemicals and hydrocarbons used in Cloudbreak activities are managed through the implementation of the Chemical and Hydrocarbon Management Plan (100-PL-EN-0011), the Chemical and Hydrocarbon Storage Procedure (100-PR-EN-1064) and Environmental Spill Response Procedure (IO-PR-EN-0003).

The proposed Cloudbreak CBP has the potential to release chemicals and hydrocarbons to the environment during storage, handling, transportation, and disposal. Specific management measures to reduce the risk of environmental impacts include:

- 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.

- Using containment measures during maintenance activities to capture chemical and hydrocarbon spills and waste material.

- Disposing of waste chemicals and hydrocarbons and contaminated material to an appropriately licenced facility.

7.6 Waste

Potential impacts of waste generated by Cloudbreak activities are managed through the implementation of the Non-Mineral Waste Management Plan (IO-PL-EN-0003).

The proposed Cloudbreak CBP has the potential to release waste to the environment. Specific management measures to reduce the risk of environmental impacts include:

- Capturing liquid waste from supporting infrastructure such as ablutions facilities in a sealed holding tank. The tank will be emptied via a licenced contractor as required and the liquid waste transported to an approved treatment and disposal site to prevent wastewater discharge on site.

- Containing, storing, transporting, and disposing of solid waste in accordance with the Non-Mineral Waste Management Plan (IO-PL-EN-0003).

- Controlled waste will be managed in accordance with the *Environmental Protection (controlled waste) Regulations 2004*.

7.7 Noise Management

The proposed activities have a negligible risk of environmental noise emissions due to the remote location, therefore management measures are not required under the *Environmental Protection (Noise) Regulations 1997*.

8 REFERENCED DOCUMENTS

Title	Document Number
Surface Water Management Plan	100-PL-EN-1015
Chemical and Hydrocarbon Management Plan	100-PL-EN-0011
Chemical and Hydrocarbon Storage Procedure	100-PR-EN-1064
Environmental Spill Response Procedure	IO-PR-EN-0003
Dust Management Plan	IO-PL-EN-0001
Vegetation Health Monitoring and Management Plan	100-PL-EN-0019
Non-Mineral Waste Management Plan	IO-PL-EN-0003
Groundwater Operating Strategy	CB-PH-HY-0009

DOCUMENT CONTROL

Attachment 3B Supporting Document		
Status	IFU - Issued for Use	10-May-24
Summary of Changes	Fortescue seeks to continue the development and support of Fortescue's activities in the Pilbara by amending the current Cloudbreak Iron Ore Mine Licence L8199/2007/2 under s59B of the EP Act to facilitate the following activities: • Increase in the Brampton In-Pit TSF maximum allowable tailings elevation from RL 423 m AHD to RL 426.7 m AHD. • Increase in groundwater abstraction and reinjection from 150,000,000 tonnes per annum to 175,000,000 tonnes per annum in accordance with the Cloudbreak section 45C approved on 9 February 2024 (MS 1010). • Addition of a new prescribed premises category 77 for concrete batching to produce up to 55,000 tonnes per annum of concrete for Fortescue projects located outside of the prescribed premises boundary.	
Author(s)	[redacted]	
Checked or Squad Review# (if applicable)		
Approved		
Next Review Date (if applicable)		

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Figure 7: Project location

Figure 8: Prescribed premises boundary

Figure 9: Brampton In-Pit TSF and Concrete Batching Plant

Figure 10: Fortescue Marsh monitoring bores and predicted drawdown

Figure 11: Siting and location

Figure 12: Vegetation communities

Figure 13: Conservation significant flora and fauna habitat

Figure 14: Land systems

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