Mt Magnet Gold Project – ATT 8 Works Approval: Additional Information

1. Project overview

1.1. Location

Mt Magnet Gold Pty Ltd owns and operates the Mt Magnet Gold mine (MMG) located adjacent to the town of Mount Magnet in the Murchison Region of Western Australia (WA). Tenements are held by Mt Magnet Gold Pty Ltd, a wholly owned subsidiary of Ramelius Resources Ltd.

1.2. Ownership

Ownership and tenement details are in **Table 1**. Only tenements relevant to this works approval application have been provided.

Table 1: *Ownership and authorised representative*

Tenement details		
Tenement	**Holder**	**Expiry date**
M58/194	Mt Magnet Gold Pty Ltd	26/10/2034
G58/003	Mt Magnet Gold Pty Ltd	9/05/2031
Proponent details		
Company name	Mt Magnet Gold Pty Ltd	
ACN/ABN	008 669 556	
Address / postal	Level 13, 58 Mounts Bay Road, Perth WA 6000	
Authorised representative	Name:	[redacted]
	Position	Environment Superintendent
	Phone number	[redacted]
	Email	[redacted]

2. ATT 2 – Premises map

The proposed prescribed premises boundary including GPS coordinates, existing camp, WWTP and associated pipeline; in addition to the proposed wastewater sprayfield is in **Figure 1**.

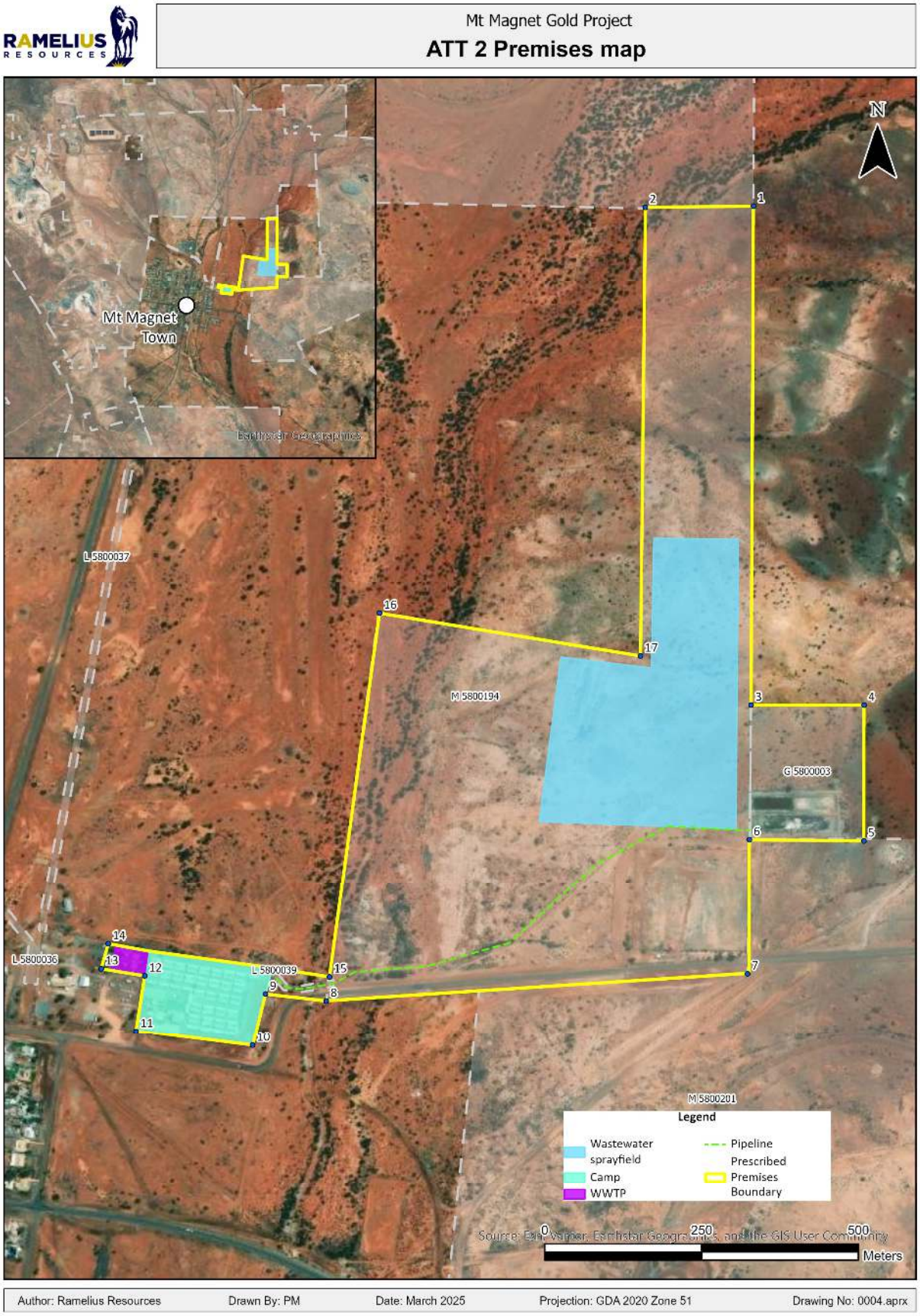


Figure 1: *Premises map – Category 54 WWTP and Wastewater sprayfield*

3. ATT 3B – Proposed activities

3.1. Category 54 – WWTP and wastewater sprayfield

3.1.1. Overview

This works approval application requests approval to construct and operate an effluent (treated sewage) disposal sprayfield (wastewater sprayfield) and associated WWTP.

MMG is upgrading the existing Blackcat SPQ Accommodation Camp (camp) at Mt Magnet. The existing camp is a 220-persons camp and contains an approved WWTP for the treatment of sewage up to 220-persons.

The camp will increase to 450-persons. The WWTP will be upgraded to manage the increased sewage generated from the camp upgrade.

Effluent from the WWTP is currently discharged to evaporation ponds registered by the *Department of Water and Environmental Regulation* (DWER) R2438/2017/1. Under R2438, the approved premises production or design capacity is 80 m^3 / day.

Due to the increase in the camp size, the WWTP will be upgraded to operate from 80 m^3 / day to 120 m^3 / day which triggers licencing under prescribed premises category 54. Effluent from the WWTP will be discharged to the new wastewater sprayfield. The existing evaporation ponds listed under R2438/2017/1 will remain operational and continue to receive effluent as per the approved registration.

MMG may consider constructing new evaporation ponds in a similar location at a later date. This will be managed by a separate works application and or amendment.

Prescribed premises category associated with this works approval application is in **Table 2**.

Table 2: *Works approval application – requested prescribed premises category*

Prescribed premises category				
Category	**Category description**	**Production or design capacity**	**DWER R2438 approved premises or design capacity**	**Actual production / design capacity**
54	Sewage facility: premises a) on which sewage is treated (excluding septic tanks) or b) from which treated sewage is discharged onto land or into waters.	100 m^3 or more per day	80 m^3 / day	120 m^3 / day

3.1.2. WWTP

A WWTP is required for the on-site processing of sewage waste from the camp. The WWTP comprises a treatment system, storage facilities and a dedicated disposal area (wastewater spray-field) connected via a HDPE pipeline.

The WWTP will be upgraded to operate from 80 m^3 / day to 120 m^3 / day, treating the equivalent of 250 L of wastewater per person per day (for a maximum camp occupancy of up to 450 persons).

The Coerco Chemical, Process and Water storage tanks to be used for the WWTP are suitable for use in direct sunlight with ambient temperatures as high as 60 degrees. All raw materials are quality grade linear low-density polyethylene certified to AS/NZS4020:2002 and AS2070 Part 1 and Part 8 for food contact and all tanks are manufactured in guidance to Australian Tank Standard AS/NZS 4766:2006.

A proposed works schedule is in Section 3.1.5. A six-month period for time limited operations is requested that would commence at completion of construction.

Prior to the end of the TLO period, a new licence application will be prepared and submitted for the new prescribed premises category 54 and associated premises boundary. This licence application will remain separate to the MMG licence L5529 which authorises prescribed premises categories not relevant to this application and has a separate premises boundary.

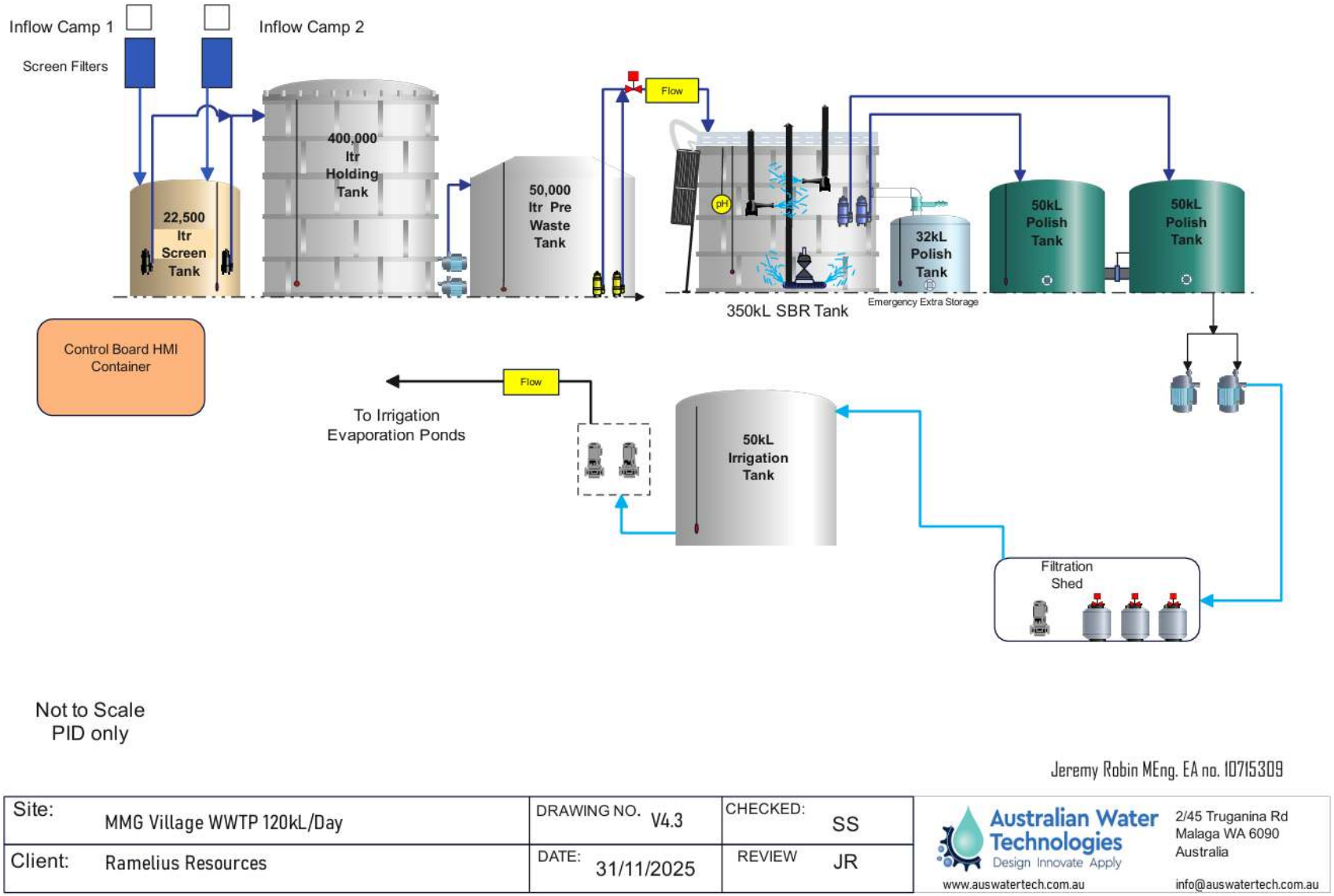


***Figure 2**: WWTP schematic*

3.1.3. *Wastewater sprayfield*

The sprayfield will comprise a total irrigated area of 9.0 hectares (ha), divided into 6 duty / rest irrigation blocks, each approximately 1.5 ha in area. Each block will be managed to facilitate even distribution. A conceptual design for the sprayfield and blocks is in **Figure 3**.

The sprayfield system maximum hydraulic flow rate will be 120,000 L / day. The irrigation method is via low-pressure 'wobbler sprinklers' operating at approximately 1.0 bar. Sprinklers will be installed in 12 m x 12 m rows / grids. This configuration minimises aerosol formation and wind drift while providing uniform application.

The wastewater sprayfield will comprise a 6-ft perimeter chain-wire fence with appropriate visible signage to deter access.

Both the sprayfield perimeter and each block will contain containment bunding approximately >1m high. On the disposal side of the bunding, a v-drain will be constructed to eliminate the potential for effluent migration should the unlikely event of ponding occur.

Four 36 kL wet weather storage tanks will be installed at the sprayfield to contain up to 2-days effluent storage in the event of equipment/ infrastructure malfunction or failure, and or during extreme wet weather events when irrigation would be ceased.

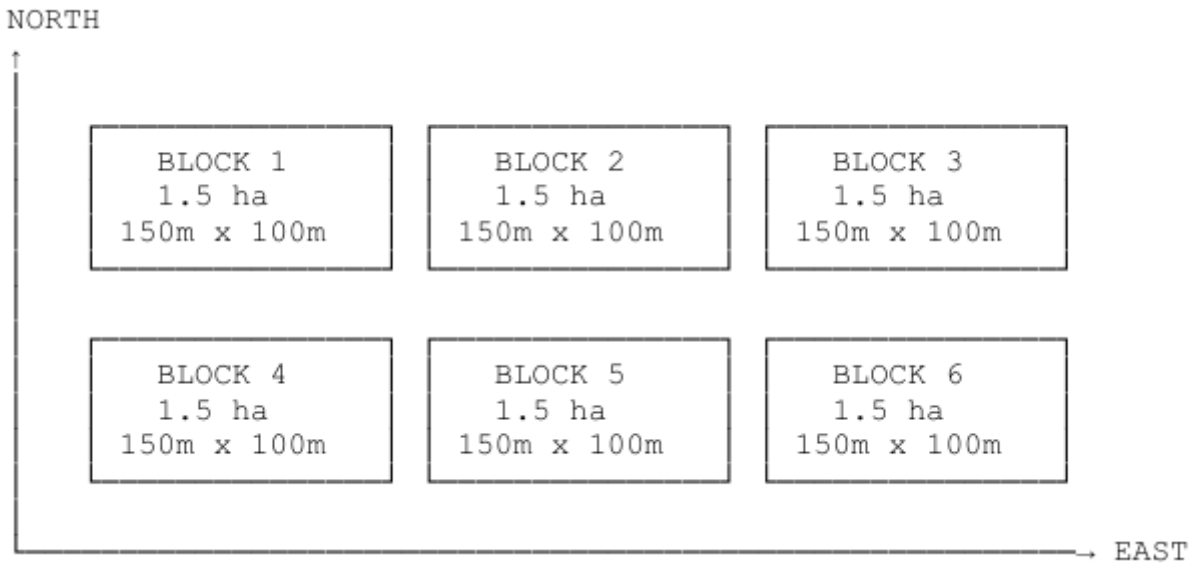


Figure 3: *Proposed wastewater sprayfield configuration*

3.1.4. *Pipeline*

There is an existing pipeline from the current / approved WWTP to the evaporation ponds registered under R2438/2017/1. The pipeline consists of HDPE pipe situated within earthen v-drains for secondary containment.

Telemetry / volumetric meters are installed and will be used to monitor compliance with daily / annual volumes of effluent discharged from the sprayfield, as well as to detect malfunctions or failures with the system. Daily inspections are carried out on the pipeline for visual integrity and identification of any required maintenance issues.

3.1.5. *Works schedule*

A proposed work schedule is in **Table 3**

Table 3: *Proposed works schedule*

Works schedule			
Infrastructure	**Construction**	**Commissioning**	**Time-limited operations**
WWTP upgrade and wastewater sprayfield	March – April 2026	May 2026	Six-month period from completion of construction / operation and submission of ECR.

4. ATT 5 – Other approvals and consultation documentation

4.1. Relevant approvals

Approvals relevant to this works approval application are in **Table 4**.

***Table 4**: Relevant approvals*

Approvals relevant to this works approval application		
Agency	**Approval**	**Relevance**
DWER	Works approval	This works approval application is for prescribed category 54. A new licence application will be submitted prior to the end of the TLO period. This licence application will be separate to that approved for the MMG i.e., L5529. MMG has undertaken consultation with DWER regarding appropriate approval pathways for the upgraded WWTP and wastewater sprayfield. This application contains a new prescribed premises boundary for the WWTP upgrade, wastewater sprayfield and associated pipeline.
	L5529	No change to the existing licence and prescribed premises categories listed under the L5529. No change to the existing prescribed premises boundary under L5529.
	Clearing permit	MMG maintains CPS 7445-2 and CPS 11093-1. A clearing permit is not required for this activity. It will be managed as a low-impact activity under s.1 *EP (Clearing of Native Vegetation) Regulations 2004*. Any clearing required for the installation of the perimeter fence and containment bunds will be in accordance with the exemption that allows clearing up to 10 hectares per financial year per authority area (M58/194 and G58/003) for clearing regulated under the *Mining Act 1978*. MMG will implement clearing avoidance measures such as positioning of access tracks and fences throughs areas of sparse to no vegetation. Clearing is not anticipated for the installation of the irrigation system and will be limited to construction of the earthen bunds. Vegetation will be retained over the entire irrigation area as far as reasonably practicable.
DMPE	Mining Proposal and MCP	MMG is undertaking a site-wide review of the MCP. This will include closure implementation

Approvals relevant to this works approval application		
		requirements for decommissioning and rehabilitation of the WWTP and sprayfield. MMG operates the project under several mining proposals / MDCP.
DOH	WWTP application	All relevant approval documentation has been submitted to DOH for the construction and operation of the WWTP upgrade and wastewater sprayfield.
Shire	Building permit	All relevant approval documentation including building permits, have been submitted to the Shire of Mt Magnet and will be obtained prior to any works on the WWTP upgrade. A building permit is not required to construct the wastewater sprayfield. MMG is in discussion with the Mt Magnet Shire with regard to any required permits/approvals and will ensure these are obtained, if necessary, prior to works commencing.

4.2. Consultation

Consultation is ongoing with relevant principal stakeholders and will continue through the construction and operation phases.

Principal stakeholders include:

- *Department of Water and Environmental Regulation*
- *Department of Mines, Petroleum and Exploration*
- Local government – Mt Magnet Shire
- *Department of Health*
- *Traditional Owners – Badimia Group*
- *Pastoral lease holders*
- *Community*

MMG is focused on developing relationships and maintaining regular communication with stakeholders. Initial feedback received from the stakeholders during this period indicates support for the new disposal system, camp upgrade and WWTP upgrade.

MMG is undertaking initial consultation with the Shire of Mt Magnet for the shared used of treated water for purposes including irrigation of town gardens and sports ovals. This aims to reduce the reliance on more valuable potable sources of irrigation water and strengthen the collaboration between the two parties. This consultation is ongoing and any relevant approvals/ agreements will be obtained prior to commencement.

Consultation is undertaken with stakeholders so that they are informed, with any concerns and interests addressed. MMG maintains a register of stakeholders, this is periodically reviewed, to ensure relevant parties are identified, and to consider requests from other parties that declare an interest and ask to be consulted.

All records are maintained within Ramelius' document management system i.e., INX.

5. ATT 6A – Emissions and discharges

5.1. Wastewater

The sprayfield system maximum design basis and site load expected due to the site accommodation capacity and nominated occupancy potential for the wastewater sprayfield is in **Table 3**. Conservative nutrient application rates consistent with WA arid-zone best practice have been adopted.

Table 5: *Maximum capacity and normal expected site load design details for the wastewater sprayfield*

Works schedule	
Design detail	**Maximum design basis**
Hydraulic flow rate	120,000 L/day
EP rating	450 + persons
Hydraulic allowance pp/day	265 L/pp/day
Hydraulic application rate	1.3 mm/m²/day
Effluent disposal area nominated	9 ha
Phosphorus applicate rate	9.7 kg/ha/yr
Nitrogen application rate	73 kg/ha/yr
Phosphorus output	2 mg/L
Total nitrogen output	15 mg/L
Phosphorus loading per/ha	87.6 kg
Nitrogen loading per/ha	657 kg

Effluent discharge to the sprayfield will be managed to allow discharge to infiltrate or evaporate and prevent surface ponding or runoff. The evapotranspiration at the site is approximately 3,600 mm per annum or 3.6 m/yr. Typical rainfall in Mt Magnet is 230-250 mm/yr. The combined irrigation across the entire sprayfield is 1.3 mm per day or 475 mm per annum; application depth per event is approx. 8 mm. This loading rate is well within typical soil infiltration capacities for arid and semi-arid regions. The actual migration of effluent water into the sub-soil structure will be minimal and provide limited benefit to the vegetation growing in the sprayfield. The potential for ponding and runoff is also minimal.

Irrigation duration will be 8-hours per 24-hour period and will optimise peak evaporation rates / time i.e., during daylight hours. One irrigation block will be operated per day with each block irrigated once every 6-days. Minimum rest period per block will be 5-days. The sprayfield is phosphorus-limited, and the provided area is sufficient to sustainably manage nutrient loads.

The wastewater sprayfield is located approximately 800 m from the main town centre. The main alluvial channel is located 500 m west. The entire area is underlain by inert ultramafic bedrock, and a thin sandy clay loam topsoil layer.

There is minimal to very sparse vegetation within the proposed sprayfield area (**Figure 4**-**Figure 7**). Vegetation across the Mt Magnet area in general has been heavily degraded from historical pastoral use i.e., over-grazing and exploration/mining activity.

The area will be managed as a low-impact activity as per *Schedule 1, Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Clearing will be limited as far as reasonably practicable, only to that required to install the perimeter fence where the fenceline intersects existing shrubs etc, containment bunds and access track(s). Clearing will be in accordance with the exemption that allows clearing up to 10 hectares per financial year per authority area (M58/194 and G58/003) for clearing regulated under the *Mining Act 1978*. Clearing avoidance measures will be implemented such as positioning of access tracks and fences throughs areas of sparse to no vegetation, where clearing would not be necessary.

Install of the sprinkler systems themselves will not require clearing of native vegetation. Any disturbance will be via driving vehicles or other mechanised equipment through vegetation as required when avoidance is not possible, that is, not along existing tracks as per s.1 *EP (Clearing of Native Vegetation) Regulations 2004*. Vegetation will be retained over the entire irrigation area as far as reasonably practicable.

To prevent runoff each block will comprise a perimeter bund approximately 1 m in height to contain any potential runoff. A secondary containment bund approximately 1 m in height will also be constructed around the entire perimeter of the wastewater sprayfield. The sprayfield will be constructed outside the flood plain level and will not be prone to inundation.

To prevent ponding the design basis uses low application depths per wetting event, split-cycle irrigation and rotational blocks, periodic resting of blocks and low-pressure wobbler sprinklers. Irrigation will be suspended during heavy rainfall or high winds.

Ongoing monitoring of effluent discharge quality and groundwater quality and levels will be conducted in accordance with AS/NZS 5667.10 for wastewater sampling and AS/NZS 5667.11 for groundwater sampling.

Regular inspections of the WWTP and discharge infrastructure (i.e., vegetation stress, ponding, and runoff) will be conducted, and maintenance performed where any equipment is found to be faulty or any leaks are detected.

6. ATT 6B – Waste

6.1. Treated sewage

Approximately 120 m^3/day of effluent (treated sewage) will be discharged to land via the wastewater sprayfield from the camp WWTP. The sprayfield will be surrounded by a perimeter bund in addition to secondary bunding around each block. It will be constructed outside the flood plain level and will not be prone to inundation.

The emissions points include 12m x 12m spaced rows of sprinklers. Where the treated sewage is discharged to the wastewater sprayfield from the emission points, it will be done so in accordance with the licence.

The disposal area has been sited over land that is flat, such that run-off is limited. Vegetation will be retained as far as reasonably practicable to assist with nutrient uptake. The size of the disposal area has been calculated to allow in situ soils to accommodate anticipated nutrient loads. The depth to groundwater within the disposal area has been reviewed to assess the risk of infiltration and contamination of local groundwater resources.

Due to the high evaporation rates, low annual rainfall totals, low irrigation volumes per day over the entire area, and depth to groundwater resources, the risk to water resources is negligible.

Pumps and pipework will be selected, installed, and maintained as per the suppliers' specifications. Monitoring of wastewater discharge to land will be undertaken as per **Table 6**.

Table 6: *Monitoring of emissions to land*

Monitoring of wastewater sprayfield				
Emissions point	**Parameter**	**Units**	**Averaging period**	**Frequency**
WWTP discharge point	Volumetric flow rate (cumulative)	m^3 / day	Monthly	Continuous
	pH	pH	Spot sample	Quarterly
	Total suspended solids	mg/L		
	Biochemical oxygen demand			
	Total nitrogen			

Monitoring of wastewater sprayfield				
	Total phosphorus			
	E.coli	cfu/100 mL		

7. ATT 7 – Siting and location

7.1. Siting context

Mt Magnet is located within the Murchison Bioregion of WA. The project area is located within the further divided Eastern Murchison subregion.

The landscape of the Murchison Bioregion comprises low hills, mesas of duricrust separated by flat colluvium and alluvial plains (Commonwealth Government, 2020). It is dominated by the Archaean (over 2500 million years ago) granite greenstone terrain of the Yilgarn Craton.

Alluvial soils and sands mantle the granitic and greenstone units of the Yilgarn Craton. These soils are shallow, sandy and infertile. Underlying the soils in low areas is a red-brown siliceous hard pan. The soils in the eastern half of the bioregion are typically red sands, calcareous red earth soil, duplex soil and clays. There are 41 vegetation associations (hummock grasslands, succulent steppe or low woodlands). The bioregion is rich and diverse in both its flora and fauna, but most species are wide ranging and usually occur in adjoining regions.

The Eastern Murchison subregion comprises the northern parts of the craton's Southern Cross and Eastern Goldfields Terrains and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. Salt Lake systems are associated with the occluded paleodrainage system. Broad plains of red-brown soils and breakaway complexes as well as red sandplains are widespread. Vegetation is dominated by Mulga woodlands and is often rich in ephemerals, hummock grasslands, saltbush shrublands and Samphire shrublands. The Eastern Murchison subregion comprises diverse mulga woodlands, which occur on low greenstone belts. The sand plains have red loamy earths and red deep sands which are found on the sandy banks.

The dominant land uses of the Eastern Murchison subregion include grazing native pastures (85.47%), unallocated crown reserves (11.34%), conservation (1.4%) and mining (1.79%).

The survey area lies within the Murchison Province, which consists of hardpan wash plains and sandplains (with some stony plains, hills, mesas and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils include red loamy earths, red sandy earths, red shallow loams, red deep sands and red-brown hardpan shallow loams (with some red shallow sands and red shallow sandy duplexes). Vegetation comprises of mulga shrublands with spinifex grasslands (and some bowgada shrublands, eucalypt woodlands and halophytic shrublands).

There are no permanent/ perennial inland waters or drainage lines within the broader area. There are several minor ephemeral drainage lines occurring to the west of the proposed sprayfield.

7.2. Specified ecosystems

A detailed flora and vegetation survey and a basic fauna assessment was conducted in 2024 for the area surrounding the proposed sprayfield. Eleven vegetation types were identified. These vegetation types were identified within five landform types and comprised of three major vegetation groups, which were represented by a total of 28 families, 49 genera and 100 taxa. Six species of introduced flora were observed.

Based on the vegetation condition rating scale specified in the *Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a), vegetation was rated as 'completely degraded' to 'very good'. Disturbances across the area were a result of previous mining/exploration and pastoral land use.

Field surveys identified no Threatened Flora or Threatened Ecological Communities listed under the *Western Australian Biodiversity Conservation (BC) Act 2016* or *Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999* were identified within the broader area.

Field surveys identified no Priority Ecological Communities. There was no evidence of conservation significant fauna observed. There are no Ramsar wetlands of international importance or sites listed in the *Directory of Important Wetlands* (DIWA), wetlands identified as nationally important, nor any proposed or gazetted conservation reserves within the broader area.

The construction and operation of the proposed sprayfield will be managed as a low-impact activity as per s.1 *EP (Clearing of Native Vegetation) Regulations 2004*. Any clearing will be limited to that required to construct the perimeter fence, access track(s) and containment bunds. There will be no clearing required to install the irrigation system (i.e., sprinklers). Any clearing will remain exempt under the *Mining Act 1978*, that is, clearing up to 10 ha per FY per authority area (M58/194 and G58/003).

Typical vegetation ensembles for the sprayfield area in **Figure 4** to **Figure 7**.

Figure 4: *Typical vegetation – Photo facing north – wastewater sprayfield*

Figure 5: *Typical vegetation – Photo facing south – wastewater sprayfield*

Figure 6: *Typical vegetation – Photo facing east – wastewater sprayfield*

Figure 7: *Typical vegetation – Photo facing west – wastewater sprayfield*

7.3. Aboriginal and other heritage sites

A preliminary site inspection has been undertaken to identify heritage sites of archaeological and ethnographic importance. There are no registered Aboriginal heritage places within area specified, listed under the DPLH Register.

One AHS is located 550 m south of the proposed sprayfield area and will not be impacted (DPLH ID 4452). A second AHS is located 550 m northwest (DPLH ID 4453) and will not be impacted.

No known registered or unregistered European heritage sites are located within the proposed sprayfield area.

A detailed heritage avoidance survey is planned as an additional precautionary measure prior to construction works and will be a condition of approval prior to works commencing.

7.4. Groundwater and surface water

Mount Magnet is located 330 km east of Geraldton in the uppermost headwaters of the internally draining Salt River catchment and immediately south of the southeast corner of the Murchison.

Rainfall patterns are highly variable. Most rainfall typically occurs in the first half of the year, with maximum mean monthly rainfalls in February and June-July. Evaporation is more consistent and more strongly seasonal, with very high rates in the summer months.

The camp is located at the northeast outskirts of Mt Magnet township which is situated in an up lying valley. The main creek line which bisects the town rises in breakaway country 11 km to the north. The spray-field is located east of a minor tributary which joins the main creek south of the town.

Groundwater in the area ranges from 20 to 75 m below ground level (m bgl). There is negligible risk of effluent discharged via the sprinklers migrating to the local groundwater as most of the discharged effluent will either be taken up by existing vegetation or evaporate (from the high evaporation rates and temperatures).

Groundwater quality is saline to hypersaline with EC ranging from 2,000 µS/cm to >20,000 µS/cm. pH is neutral to circa alkaline and ranges from 7.8 to 8.5. TDS ranges from 1,200 to 9,000 mg/L. Any adverse impact to groundwater quality from the operation of the sprayfield is not expected.

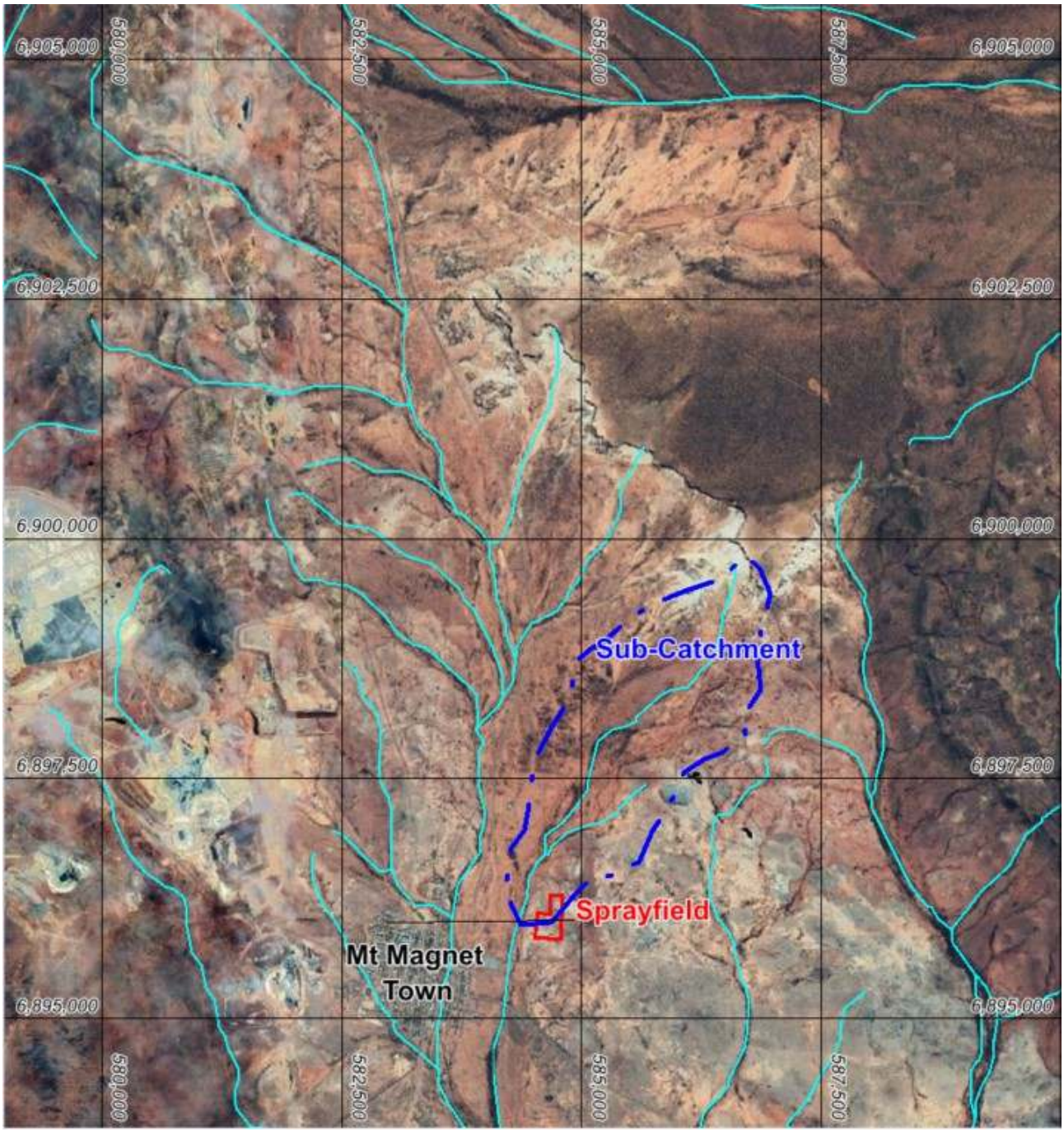
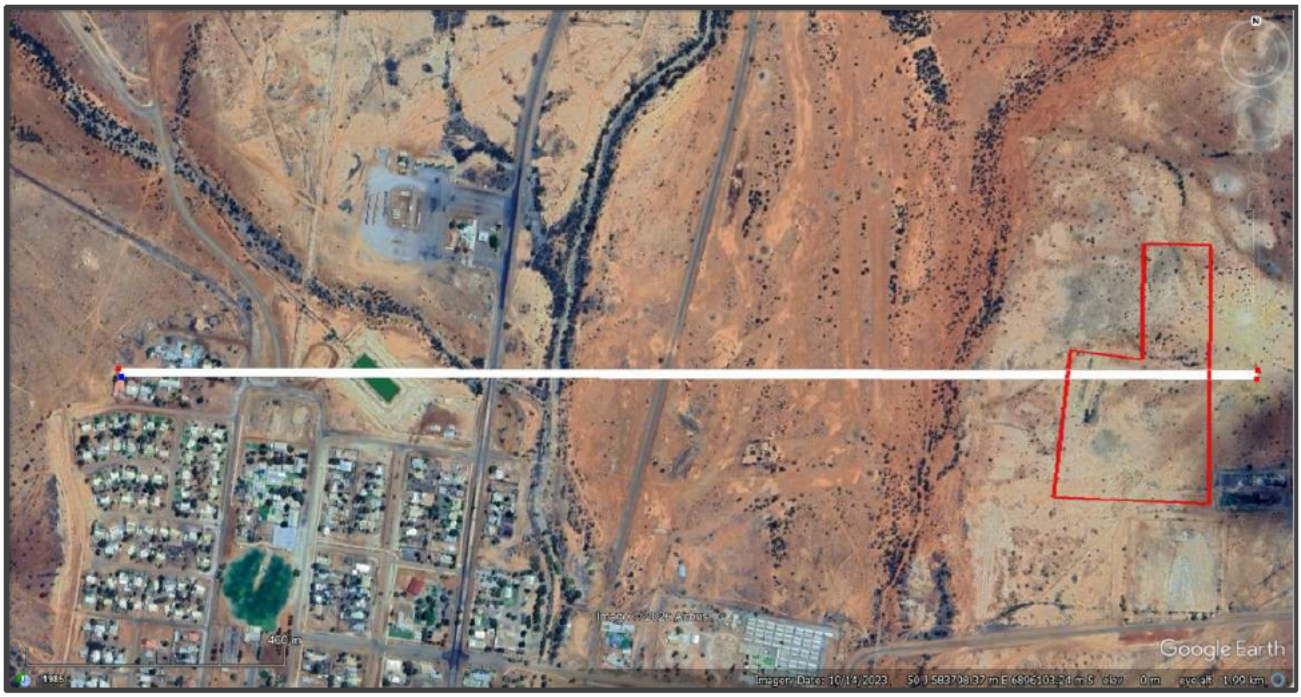


Figure 8: *Sprayfield catchment*

The main creek flood plain extends across to the eastern tributary, such that continuous sheet flow between the two creek-lines could occur under extreme flood conditions **Figure 8** . The ground elevation along the cross-section line (west to east across the north side of the town) is **Figure 9**.

The flood plain is at an elevation of 426 m AHD in that section line. The lower western side of the spray-field sits 1.5 m above the flood plain level and will not be prone to inundation. Perimeter bunding will provide a further contingency against any stormwater ingress.



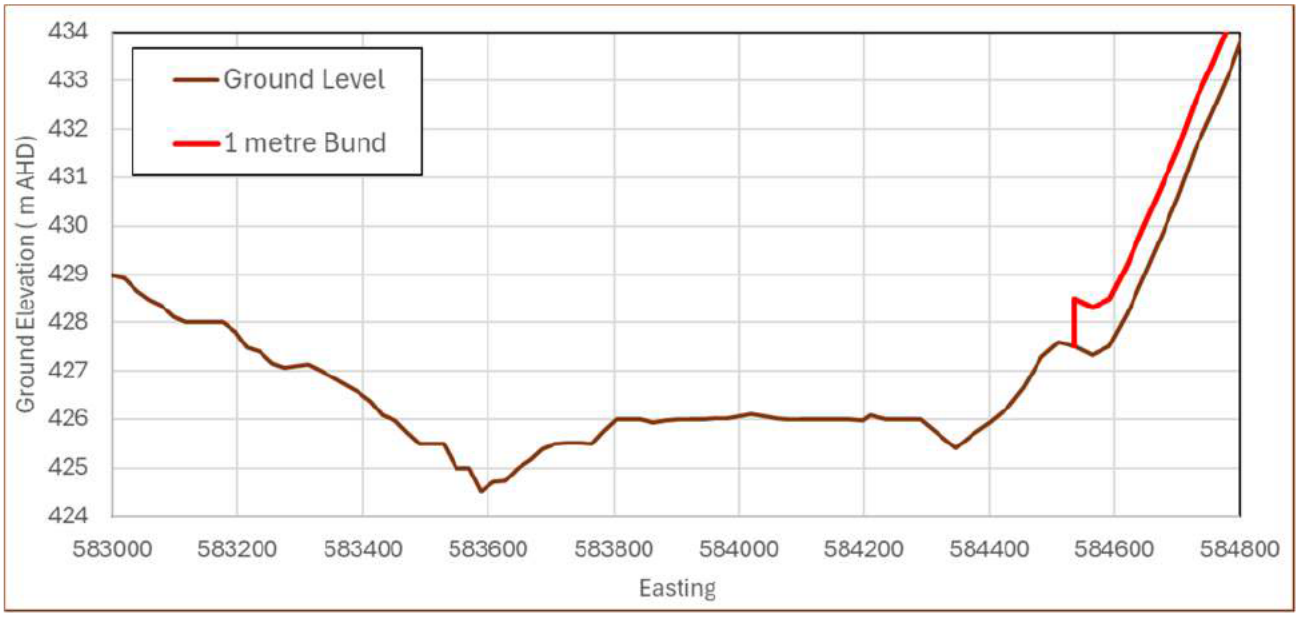


Figure 9: *Ground elevation – sprayfield*

7.5. Wind

Prevailing wind for Mt Magnet, measured from the Mt Magnet aerodrome weather station (station ID 007600), trends south-southwest/ southwest in most weather scenarios. Short term variations are possible depending on fronts and daily weather conditions.

Wind speeds tend to be higher on average in summer compared with some other seasons. Observational/forecast data shows winds from southerly / south-easterly to south-westerly directions during summer weather patterns. Surface winds may also be influenced by inland heating and high-pressure ridges typical of the inland WA climate in summer (**Figure 10**).

Wind directions become more variable in winter, with a wider spread in prevailing sectors. Regional assessments suggest that there's a noticeable increase in north-west quadrant winds during winter at similar stations. In inland WA winters, frontal systems and mid-latitude westerlies can occasionally drive winds from a broader set of directions rather than a single dominant vector (**Figure 10**).

Irrigation during windy conditions will be avoided. Spray timing and scheduling will be included as part of the operational controls. This includes spraying during low-wind conditions, avoidance of spraying during extreme heat and or dry periods that increase drift risk and use of early morning applications when winds are usually calmer.

Application rates have considered soil infiltration capacity to avoid ponding, and the system will comprise low pressure sprinklers to reduce droplet drift. A buffer no spray-zone / set back will be adopted around the perimeter of the sprayfield and will be approximately 10-20 m wide to reduce potential spray drift.

Site set out of the sprinklers will involve orientation of spray lines parallel to the prevailing wind direction, so most of the spray falls into the intended area. The use of smaller and rotational rest blocks as abovementioned in Section 3.1.3, will eliminate cross-field drift.

The perimeter fence will also act to slow wind near the spray zone. Routine visual monitoring will be undertaken to identify any potential runoff, ponding and or windblown drift outside of the sprayfield perimeter.

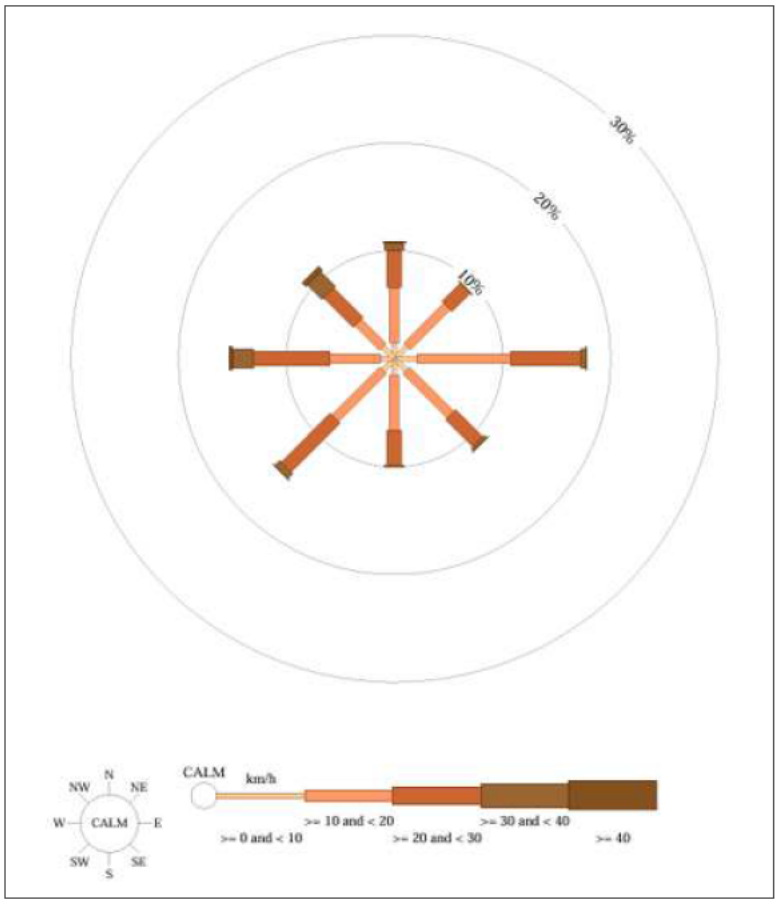


***Figure 10**: Annual wind rose (3 pm observations, 1995-2025) – Mt Magnet aerodrome weather station (ID 007600)*