



Appendix K
Environmental
Assessment Report

SEDGMAN

Queensland Resources Common User Facility Environmental Assessment Report

The State of Queensland acting through Queensland Treasury

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1 Introduction

1.1 Project Background

The Queensland Government plans to develop the Queensland Resources Common User Facility (QRCUF) (Figure 1-1) to support demonstration scale trials of processing methods and technologies for critical minerals and rare earth elements (the Project). The Project is specifically investigating vanadium processing at the facility, with the potential to process other mineral and rare earths in the future.



Figure 1-1: Mineral processing facility site layout (extract from drawing no. B071-D1-0002_04)

The objective in developing the QRCUF is to accelerate the development of commercial projects, promote investment in advanced mineral manufacturing opportunities, enable development of supply chain and supporting industries, and to position Queensland's resources industry for sustainable growth over the next 30 years.

1.2 Report Scope and Purpose

The purpose of the report is to provide an understanding of the environmental management and mitigation incorporated into the design and operation of the site. It is recognised that the proposed development is likely to trigger a number of Environmentally Relevant Activities, including ERA 8 (Chemical Storage), however application for ERAs has been deferred until sufficient supporting information is available following detailed design development and will be lodged separately to the MCU application. Therefore, the scope of this report is limited to identification and risk assessment of environmental values relevant to the operation of QRCUF at a high level based on an understanding of the basic process and considerations informing the design development.

It should also be noted that detail associated with this report, including incorporated figures, has been compiled based on design information that will continue to be refined following release of this report. However, the approaches and strategies guiding development of detailed plans and supporting information are unlikely to change, and it is this that has been focused on while preparing this report.

2 Proposed Operation Description

QRCUF is intended to be a flexible, modern, efficient, and environmentally responsible mineral processing demonstration facility capable of processing a variety of ores to extract and produce high purity critical mineral chemical products. It will be designed with a focus initially on processing ores to produce high purity chemical products of vanadium, with future allowance for additional functionality for cobalt, molybdenum-rhenium, and rare earth elements (REE). Processing of other ores and materials may be accommodated over time.

QRCUF will be based in Townsville at 109 Penelope Road, Stuart (described as Lot 14 on SP 338024) within the Cleveland Bay Industrial Park (Figure 2-1).

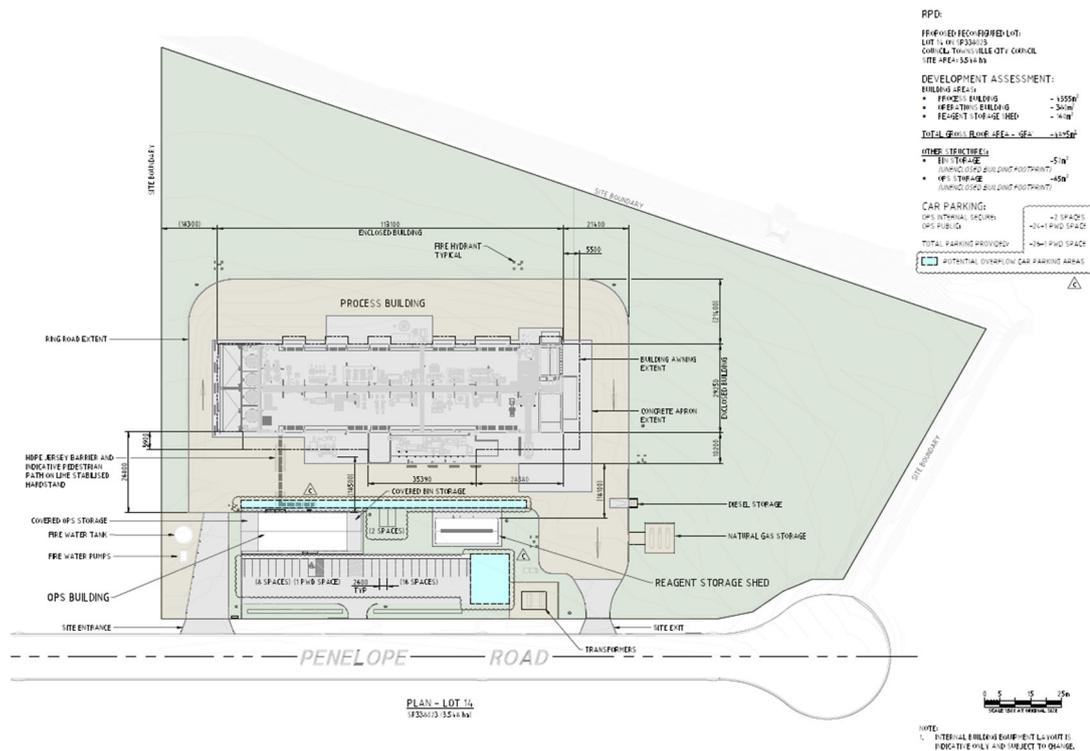


Figure 2-1: Project area allocation (extract from drawing no. B071-D1-01-0002_01 Rev C)

The high level process will include the following basic steps (Figure 2-2):

- Ore material is delivered to site via truck and stored in an enclosed area of the facility
- A front-end loader will retrieve the ore from the stockpile and load it into a hopper that will feed a conveyor
- The conveyor feeds the material into a scrubber as the first step of the metal separation process. Oversized material will be discharged, and the remaining material will continue through the process where it will go through classification, dewatering, flotation and finally concentrate thickening and filtering. Tailings will be collected through this stage, thickened and sent to tailing storage
- The metal extraction phase includes concentrate dryer and roasting, regrind, leaching, neutralisation and solvent extraction. Off-gas is created during drying and roasting, and also during the leaching process. The off gas is sent to a gas scrubbing system
- The product then enters the hydro purification stage to remove impurities
- The product then enters the thermal purification process, where the product is precipitated out of solution, dried, and roasted. Off-gas is produced during drying and roasting. The off gas is sent to a gas scrubbing system

- Throughout the process waste product is collected and sent to effluent treatment. Effluent treatment produces solid and liquid waste. Waste product is sent to waste storage where it is collected by a licensed waste contractor for disposal.

The purpose of this generic description is to identify, for reference, discharges (off-gas and waste products) to provide context for this report.



Figure 2-2: Basic mineral recovery process

3 Environmental Values

3.1 Surrounding Land Uses

QRCUF is located within a medium impact industry precinct of the Townsville State Development Area (SDA) in the Stuart locality of Townsville. The northern and western sides of the facility land are directly adjacent to an SDA environmental management precinct and the entire industrial complex falls within the Ross Great Barrier Reef catchment boundary (Queensland Government, 2024).

Sensitive receptors are shown in Figure 3-1, with residential properties located approximately 770 m west, south-west of the facility land border and a caravan park approximately 545 m south-west (Queensland Government, 2024).



Figure 3-1: Land use surrounding the QRCUF.

Adapted from Queensland Globe, by Queensland Government, 2024.

3.2 Climate and Meteorology

The nearest meteorological monitoring station to the proposed site operated by the Bureau of Meteorology (BOM) is the Townsville Aero Automatic Weather station (AWS), located approximately 11 km to the northwest (BOM, 2024). This station (Station ID 032040) was commissioned in 1940 and has long-term meteorological data for the following parameters:

- Temperature (°C)
- Rainfall (mm)
- Relative humidity (%)
- Wind speed (m/s) and wind direction (degrees)

Mean maximum temperatures range from 25.2°C in winter to 31.6°C in summer, while mean minimum temperatures range from 13.8°C in winter to 24.3°C in summer. Maximum temperatures above 44°C and minimum temperatures less than 1.1°C have been recorded (BOM, 2024).

Rainfall is relatively high in summer, reducing over autumn into winter. February has the highest monthly rainfall average of approximately 300 mm. September has the lowest average monthly rainfall of approximately 10 mm (BOM, 2024).

Morning humidity levels range from an average of around 60% in mid spring to around 75% in late summer. Afternoon humidity levels are lower, at around 55% in mid spring and 67% in late summer (BOM, 2024).

During autumn, winds occur most frequently from the southeast, with winds from the east and south occurring at a lower frequency. During winter, winds occur most frequently from between the east and south. During spring stronger winds predominantly come from the east-northeast, with winds between the east occurring at a lower frequency (BOM, 2024).

3.3 Air Quality

The nearest air quality monitoring station to the site is located approximately 8.5 km to the north of the site (SLR, 2024a). Key air quality parameters measured at this site include particulates (PM_{2.5}; PM₁₀), NO₂, SO₂ and Total Suspended Particulates (TSP) (including lead, copper, zinc, nickel, arsenic, and cadmium).

The nearest monitoring station considered to be representative of background air quality at the neighbouring receptors is the North Ward Air Quality Monitoring Station, located approximately 8.5km north of the site (SLR, 2024a). Key air quality parameters monitored at this station included particulate matter (PM₁₀ and PM_{2.5}), NO₂ and SO₂. In the absence of O₃ monitoring conducted at North Ward, 1-hour average O₃ monitoring conducted at Deception Bay AQMS were reviewed to estimate background concentrations.

70th percentile values for 24-hour average PM_{2.5} and 1-hour average NO₂, SO₂ and O₃ measured for the 2022 calendar year were adopted as site-representative background air quality concentrations. Background annual average concentrations were based on average of North Ward data reported for 2022 calendar year.

Other pollutants (NO₂, SO₂ and TSP) are below acceptable air quality limits (SLR, 2024a).

3.4 Noise

Available baseline noise monitoring information for the site is described as 38 dBA during the day, 40 dBA in the evening period and 35 dBA at nighttime (SLR, 2024b).

Acoustic quality in the area of the site is currently considered below the *Environmental Protection (Noise)* acoustic quality objectives.

Table 3-1 EPP (Noise) Acoustic quality objectives

Sensitive Receptor	Time of day	Acoustic Quality Objectives			Environmental Value
		L _{Aeq,adj,1hr}	L _{A10,adj,1hr}	L _{A1,adj,1hr}	
Residence (for outdoors)	Daytime and evening	50	55	65	Health and wellbeing
Residence (for indoors)	Daytime and evening	35	40	45	Health and wellbeing
	Nighttime	30	35	40	Health and wellbeing, in relation to the ability to sleep

Baseline noise monitoring at the site was undertaken by SLR as part of noise modelling undertaken for the project. The results were described as 38 dBA during the day, 40 dBA during the evening and 35 dBA during the night (SLR, 2024b). This aligned with acoustic monitoring previously undertaken by SEG in 2023 (SLR, 2024b).

3.5 Flora and Vegetation

The site is completely cleared (Figure 3-2) (Queensland Government, 2024). The nearest mapped vegetation is approximately 120 m to the north of the site and associated with the watercourse (Figure 3-2). This vegetation is recognised as regional ecosystem 11.3.25b and belongs to the Brigalow Belt bioregion (11) (Queensland Government, 2024). This vegetation group includes alluvial systems (3), with the specific ecosystem type being *Eucalyptus tereticornis* or *E.camaldulensis* woodland vegetation (25b) (Queensland Government, 2024). This ecosystem type characteristically fringes drainage lines (Queensland Government, 2024).

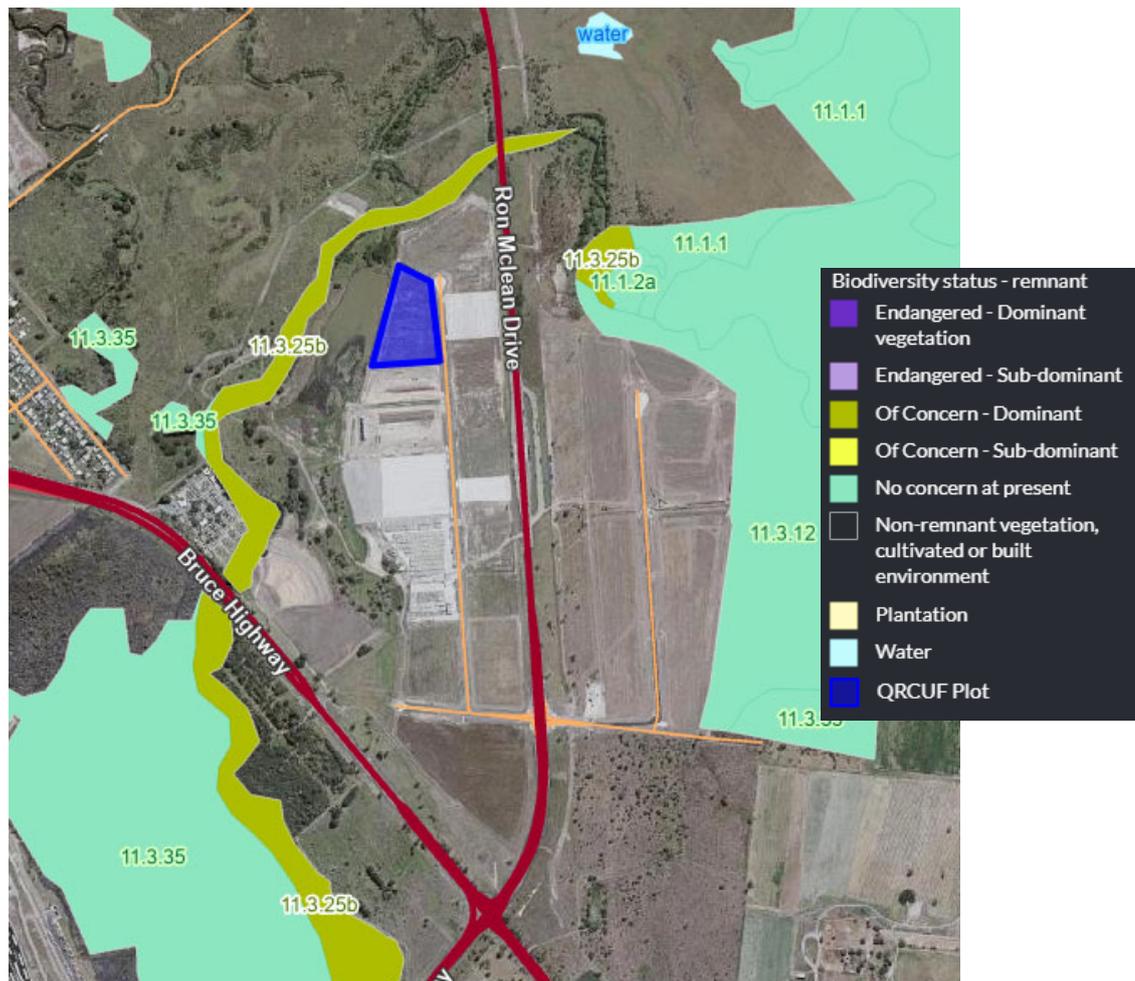


Figure 3-2: Flora and vegetation surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

3.6 Biodiversity and Conservation Values

There are no biodiversity or conservation values mapped as occurring on the site. The site is completely cleared and falls within a large Regulated Vegetation Management (RVM) Category X area (Figure 3-3). The site is not considered to hold any specific biodiversity or conservation significant values.

Category R vegetation exists approximately 120 m to the north and the west of the facility along the watercourse, with overlaid areas of essential habitat for protected wildlife (Figure 3-3) (Queensland Government, 2024). Much of this land is classified as category A or B areas that is least concern (Figure 3-3) (Queensland Government, 2024). Areas of endangered or vulnerable wildlife habitat are also associated with the watercourse to the

north of the site (Figure 3-4) (Department of State Development, Infrastructure, Local Government and Planning, 2024).

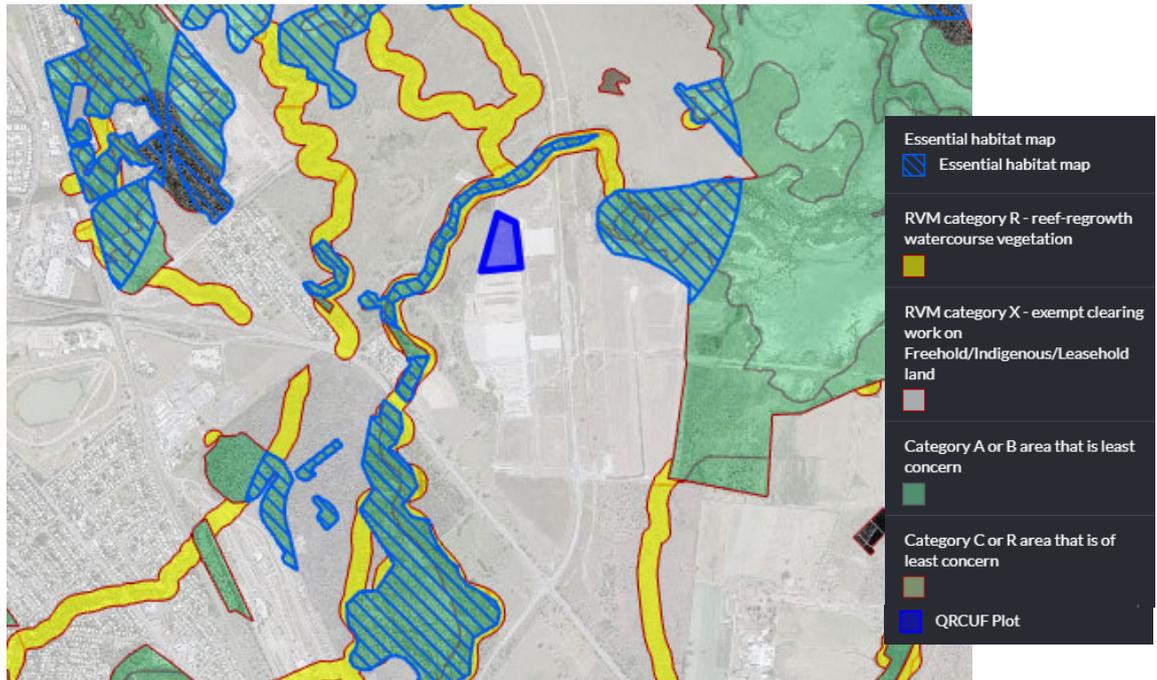


Figure 3-3: Conservation values surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

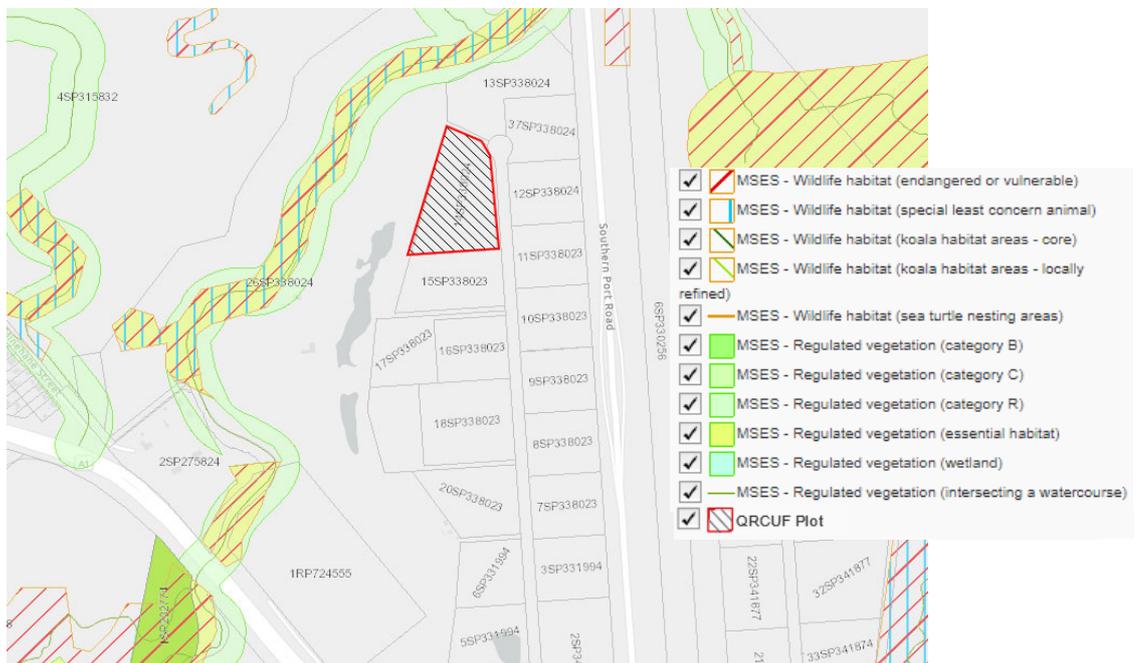


Figure 3-4: Vegetation matters of state environmental significance surrounding QRCUF.

Adapted from State Planning Policy Interactive Mapping System, State Development, Infrastructure, Local Government and Planning, 2024.

Matters of national environmental significance have been identified as having the potential to occur on, or near, the site (Department of Climate Change, Energy, the Environment and Water, 2024) (Appendix A). However, due to the cleared and developed nature of the site there is little habit value for these species.

3.7 Fauna

All habitat and fauna values were removed from the site as part of earthworks and construction activities during development of the industrial park. The nearest area of fauna habitat value is likely to be eucalyptus woodland associated with the waterway approximately 120 m to the north of the site. There is no protected, mapped fauna within a 500 m radius of the site (Figure 3-5) (Queensland Government, 2024).

Animal records within a 2 km radius of the western side of the site is dominated by bird species, with two species of frog mapped at the adjacent caravan park (Queensland Government, 2024) (Figure 3-5).

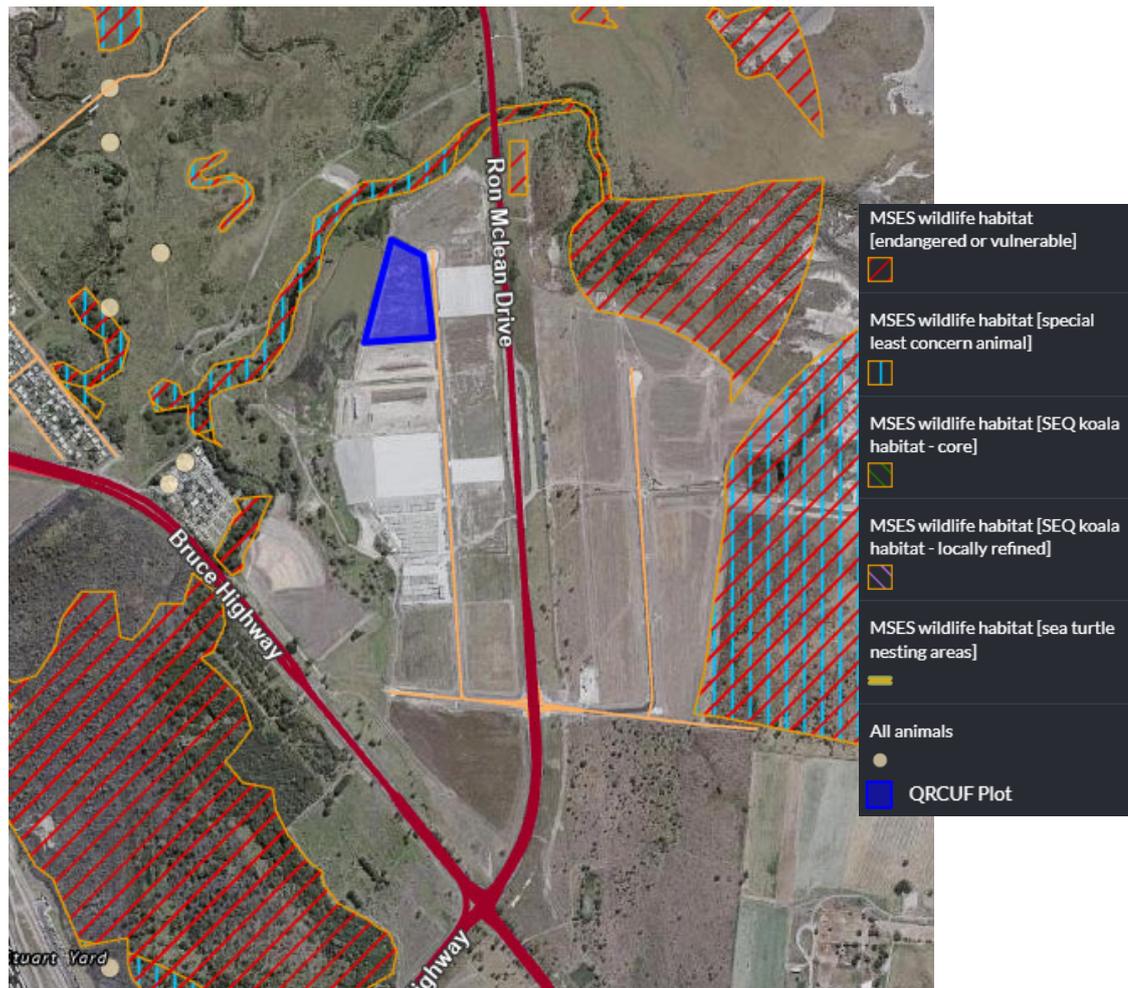


Figure 3-5: Fauna and fauna values surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

3.8 Wetlands and Waterways

There are no wetlands or waterways within the site boundary (Queensland Government, 2024). The nearest waterway, Stuart Creek, runs to the west and north of the site, and is approximately 120 m at the nearest point to the site (Queensland Government, 2024) (Figure 3-6). On the eastern side of the site, there is approximately 450,000 m² of Palustrine wetland habitat (between 1-50%) (Queensland Government, 2024) (Figure 3-6). Approximately 3.5 km to the east are the coastal wetlands that interface the Great Barrier Reef.

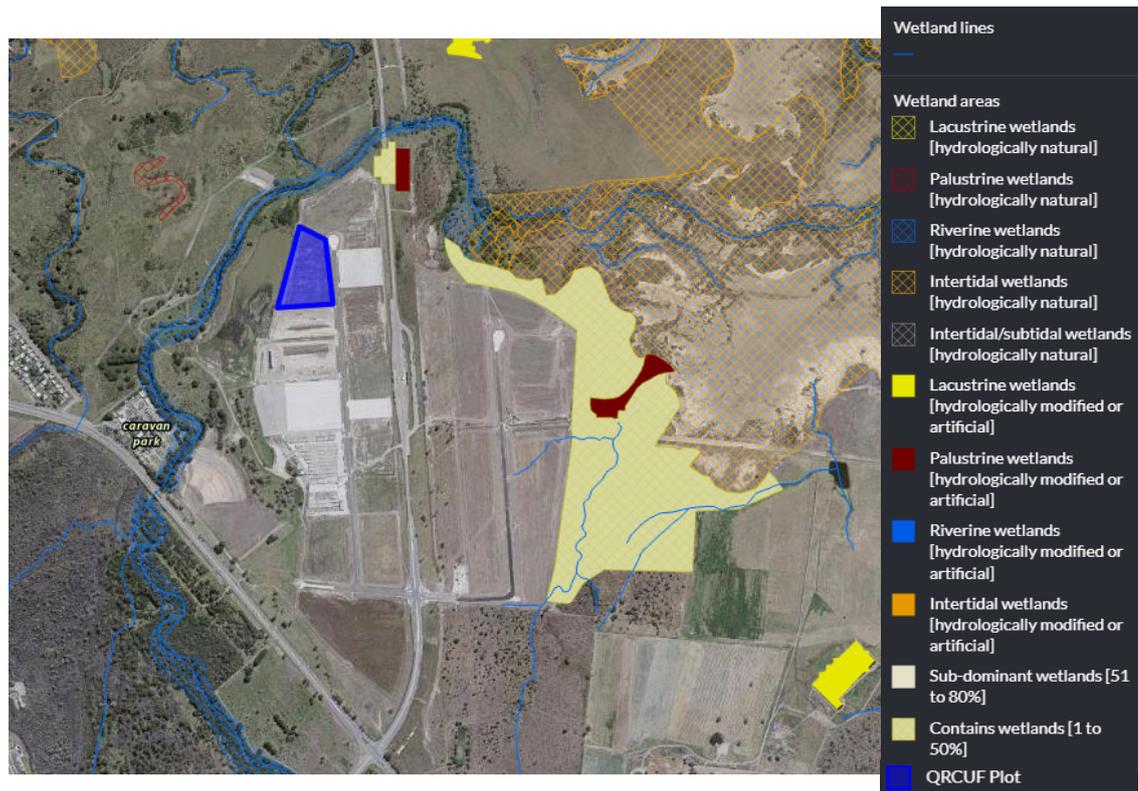


Figure 3-6: Wetlands and waterways surrounding QRCUF.
Adapted from Queensland Globe, Queensland Government, 2024.

3.9 Topography and Drainage

The site is within the Ross drainage basin, with the Mount Stuart range to the west and Mount Muntalunga to the south-east (Figure 3-7) (Queensland Government, 2024).

In accordance with the Queensland Urban Drainage Manual (QUDM) test in determining the lawful point of discharge (LPOD), the LPOD for the Project has been defined as:

- The open drain at the rear (western) of site (Easement P in Lot 26 on SP338024)
- The open drain along the northern boundary (Easement R in Lot 26 on SP338024)

Currently, the site is free draining in a western direction towards the easement along the western boundary and discharging into the existing basin at the rear property (west). There is a Ø600 RCP located on the western boundary to facilitate discharge to the easement for any future potential underground network.

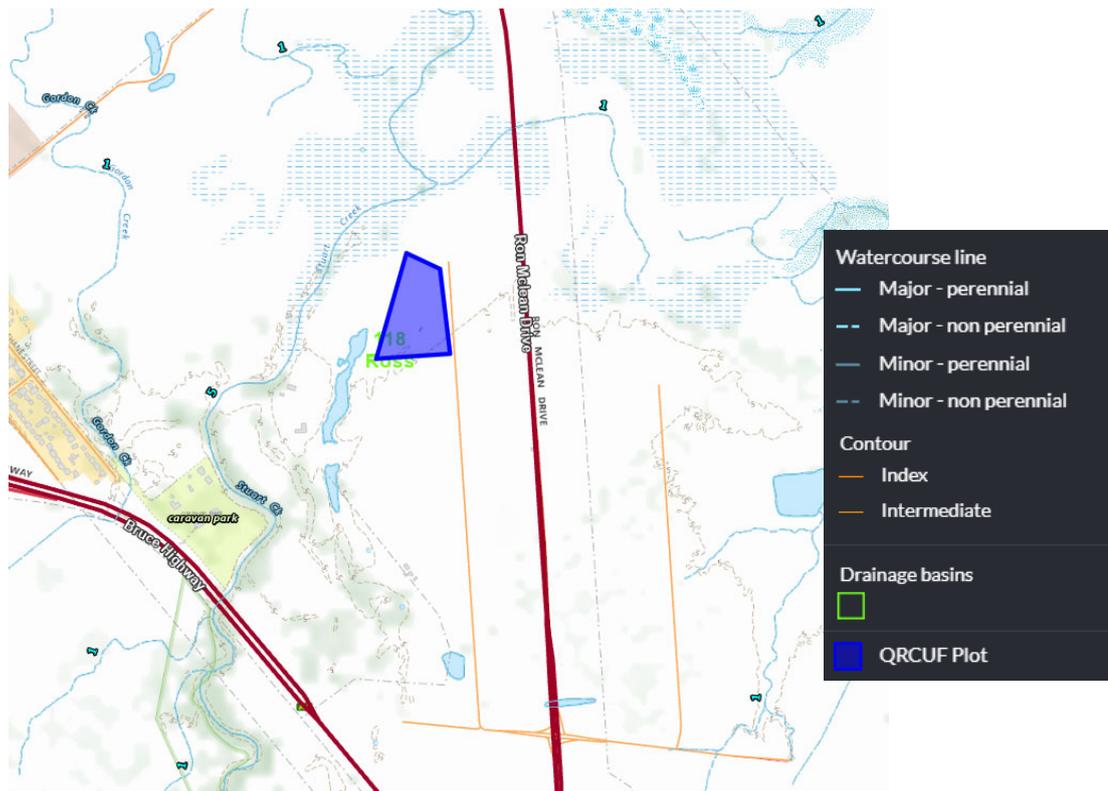


Figure 3-7: Topography and drainage surrounding QRCUF.
Adapted from Queensland Globe, Queensland Government, 2024.

3.10 Regional Geology and Soils

The regional surface geology of the site is within the Regional Townsville Hinterland surface geology area. The geology type of the site is mapped as Quaternary alluvial deposition (Qa-QLD) (Figure 3-8) (Queensland Government, 2024).

The soil at the site is classified as vertosol (Figure 3-9) (Queensland Government, 2024). Overlaying natural soils is imported fill that was brought to site during development of the industrial park. Depth of fill ranges between approximately 0.8 m and 1.25 m (PGI, 2024).

The site is not listed on the *Environmental Management Register* or the *Contaminated Land Register* (Appendix B).

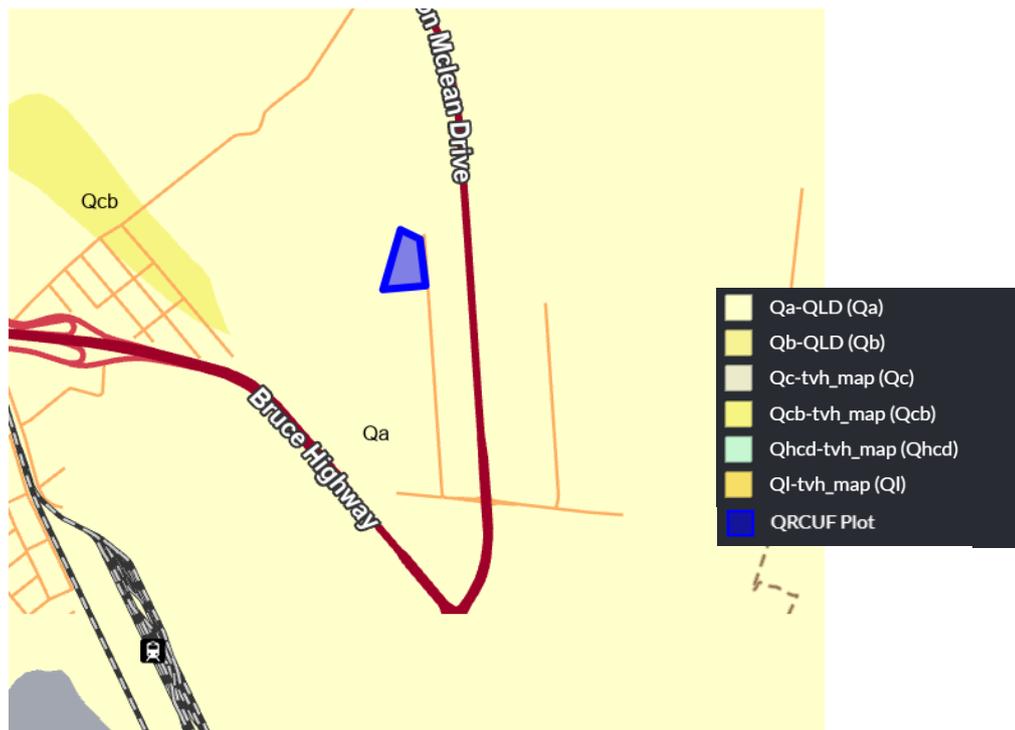


Figure 3-8: Regional surface geology of the area surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

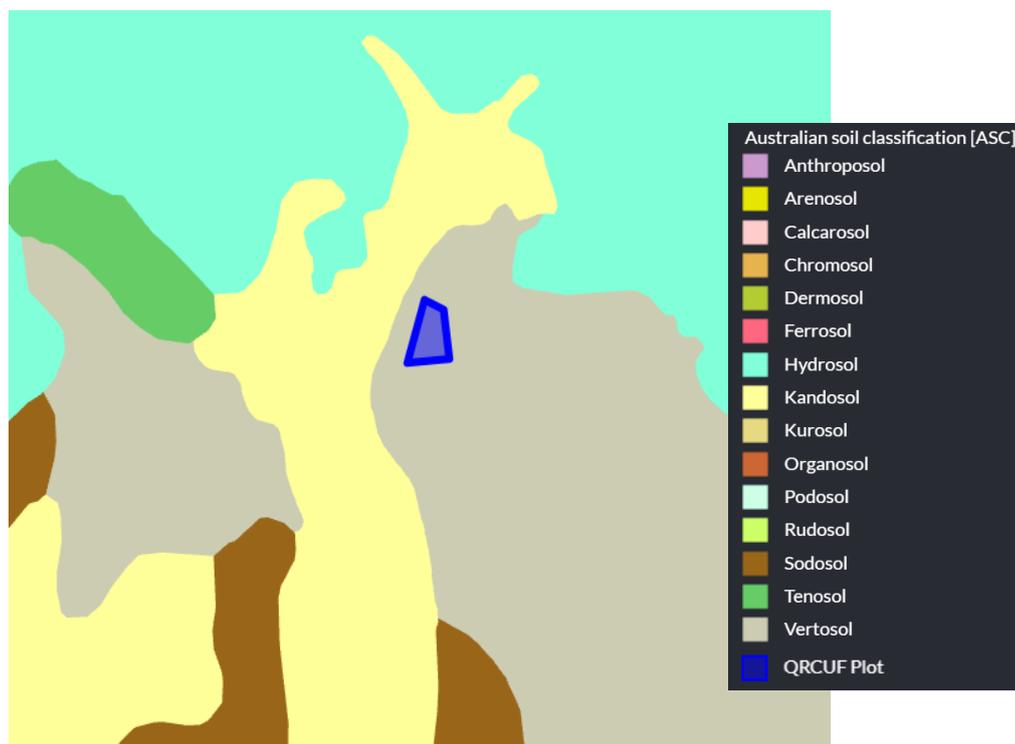


Figure 3-9: Australian Soil Classification surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

3.11 Groundwater

3.11.1 Registered Groundwater Bore Search

A groundwater bore search was conducted for the site and surrounding area. Only one registered groundwater bore is located within 1 km of the site (RN 186008, sub-artesian) which lies approximately 570 m south-west of the facility at the caravan park (Figure 3-10) (Queensland Government, 2024). The bore report is located in Appendix C.

Depth to groundwater is currently uncertain, however borehole records (BH1, BH2 and BH3) from a recent geotechnical investigation (PGI, 2024) indicated groundwater was encountered at between approximately 2.5 m and 3.5 m below ground level. This should be considered indicative only as no groundwater monitoring wells have been installed at the site.



Figure 3-10: Registered groundwater bores surrounding QRCUF.

Adapted from Queensland Globe, Queensland Government, 2024.

3.11.2 Groundwater Dependent Ecosystems

There are no known Groundwater Dependent Ecosystems (GDEs) on the QRCUF land or in the surrounding area (Queensland Government, 2024). The nearest GDE is greater than 4 km east of the facility (Queensland Government, 2024).

3.12 Heritage

The site area falls within the Gudjuda Reference Group Aboriginal Corporation boundary which is Registered Native Title under Bindal People #2 (Figure 3-11) (Queensland Government, 2024). A cultural heritage management plan exists for the Townsville Port

Access Road which sits between the site and Ron Mclean Drive (Figure 3-11) (Queensland Government, 2024). There are no known cultural or European heritage values on, or in close proximity to, the site (within 1.8 km) (Department of State Development, Infrastructure, Local Government and Planning, 2024).

However, under the Duty of Care Guidelines (2023), the QRCUF facility is assumed to be defined as a Category 4 area based on the understanding that the land has previously been subject to significant ground disturbance (cleared and filled) (DSDSATSIP, 2004). Activity in Category 4 areas are generally unlikely to harm Aboriginal cultural heritage (DSDSATSIP, 2004). However, under the guidelines it is recognised that despite being a previously disturbed area, certain features of the area may have residual cultural heritage significance (DSDSATSIP, 2004).

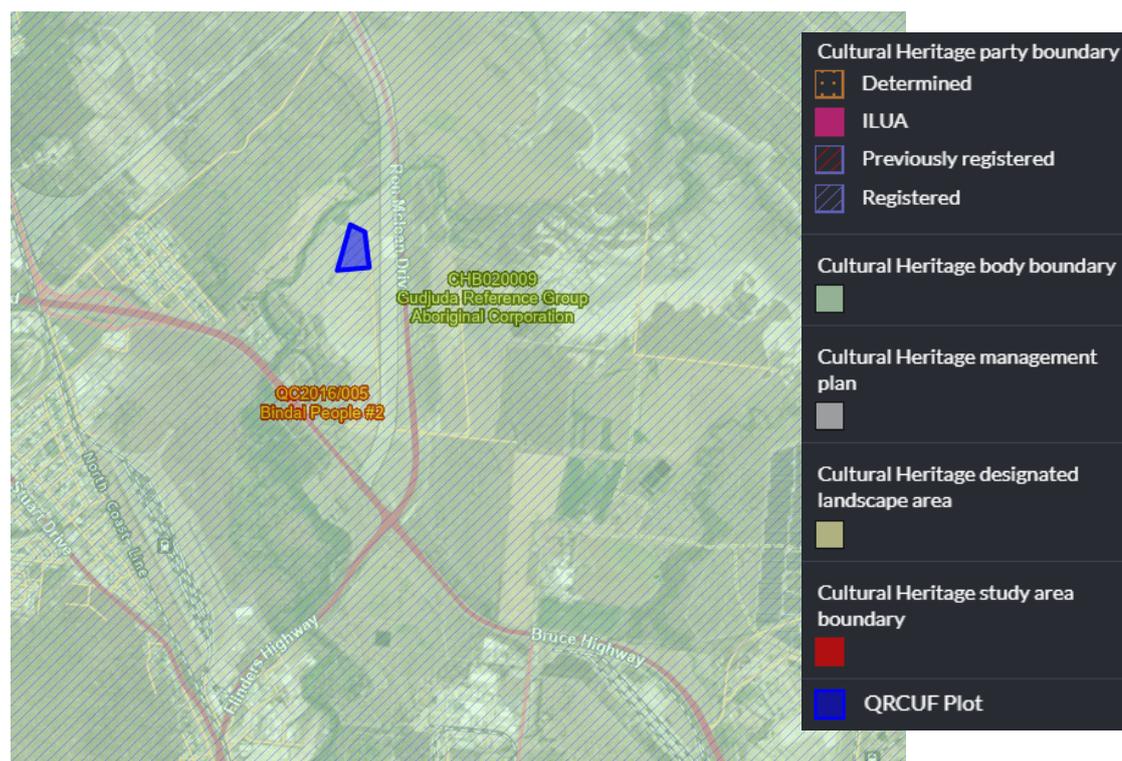


Figure 3-11: Cultural heritage values surrounding QCRUF.

Adapted from Queensland Globe, Queensland Government, 2024.

3.13 Hazards and Bushfire

The western half of the facility is at risk to medium storm tide inundation (Department of State Development, Infrastructure, Local Government and Planning, 2024) (Figure 3-12). Directly adjacent to the north, north-west corner of the facility there is also some erosion prone area and risk of high storm tide inundation (Department of State Development, Infrastructure, Local Government and Planning, 2024) (Figure 3-12). The facility and surrounding land are overlaid by flood hazard area – Level 1, according to the Queensland floodplain assessment (Department of State Development, Infrastructure, Local Government and Planning, 2024) (Figure 3-12).

The land surrounding Stuart Creek has a high potential bushfire intensity (Department of State Development, Infrastructure, Local Government and Planning, 2024) (Figure 3-12).

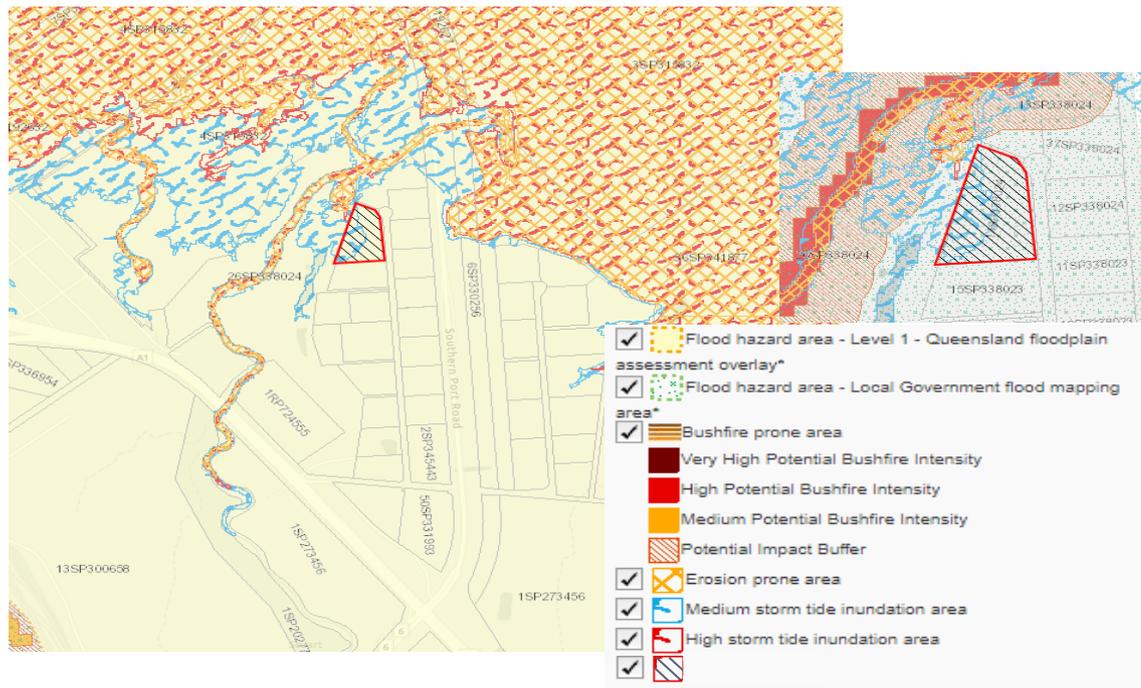


Figure 3-12: Hazards and bushfire risk surrounding QRCUF.

Adapted from State Planning Policy Interactive Mapping System, State Development, Infrastructure, Local Government and Planning, 2024.

4 Risk Assessment

A risk-based approach was implemented to determine the potential environmental impacts associated with the Project.

This approach was adopted as it provided a framework to drive discussion with the engineering and design teams in identifying management and mitigation opportunities to incorporate into the site and process design. The framework also allows a record of how potential environmental impacts associated with site operations and subsequent management and mitigation opportunities were determined.

Environmental risks associated with the construction phase of this Project will be short term and can be adequately managed through a construction phase environmental management plan. The purpose of this document is to consider the potential environmental impacts associated with the final design and operation of the Project within the Cleveland Bay Industrial Park.

4.1 Risk Evaluation Process

An environmental risk evaluation was undertaken to assess the potential or realised effects of the Project within the Cleveland Bay Industrial Park, referred to as 'Key Environmental Values' (KEV). KEVs were broadly classified into four groups – land, air, water and social (Table 4-1). There are several environmental factors associated with each KEV.

The outcomes of the evaluation are used to identify the need for specific environmental management measures within the design and operation of the Project. Management measures may include a range of design and environmental management programs, procedures or initiatives. The evaluation process also allows a repeatable mechanism for evaluating the effectiveness of management measures that are proposed to be adopted, identification of areas for improvement, or draws attention to areas that have insufficient management in place.

Table 4-1: Project area KEVs and identifiable environmental factors

KEV	Environmental factors
Land	Soils, flora and vegetation, weeds and pests, fauna, flooding, sedimentation and erosion, waste generation
Air	Noise, dust, emissions, odour, lighting
Water	Surface water, groundwater, aquatic ecology/wetlands, sedimentation, and erosion
Social	Traffic, Indigenous heritage, European heritage

Each stage within the Environmental Management Framework process is defined below:

1. Identify KEVs and the various environmental factors that sit within each. This is achieved by an assessment on State and Commonwealth environment registers and databases, as well as on the ground studies, reports, and observations, including the work undertaken by technical specialists involved with the Project.
2. Determine an effective Management Objective and Management Target for each of the environmental factors of the KEVs.
3. Compile a list of project-specific activities undertaken as part of project delivery.
4. Undertake an unmitigated risk evaluation to identify the environmental effects that may arise from each activity, and determine the potential that exists for the activity to impact on the proponent's ability to meet the defined management objectives:
 - The initial evaluation does not consider any design and environmental procedures, programs, initiatives, or other controls to avoid, minimise or mitigate environmental impacts that may be common practise in this type of project. This is known as an

unmitigated Environmental Risk Evaluation and is what might occur in the absence of any controls.

5. Identify and design environmental management measures (control measures) to avoid, minimise or mitigate each risk.
6. A residual risk evaluation is conducted.
7. Identify improvement opportunities, where required, and re-evaluate these risks through the adaptive management process:
 - This final step is used as part of the continual improvement cycle. The risk assessment is a live document and should be re-visited as knowledge improves. Reductions in risk profiles should be investigated when the risk of an incident occurring is still considered unacceptable. Opportunities also exist for improvements if risks are considered acceptable but are not as low as reasonably practical.
 - This step has not been undertaken at this stage.

It should also be noted that the risk evaluation does not necessarily consider the scale of the impact, only the likelihood of whether an impact will occur.

4.2 Management Objectives

To effectively evaluate and manage the potential or realised impacts on KEVs, management objectives (Table 4-2) for the Project have been developed for each of the KEVs environmental factors. These management objectives have been developed to the scale of the project and can be revisited. They have been developed in order to provide guidance with respect to management and mitigation opportunities.

Table 4-2: Management objectives associated with the design and operation of the Project

Environmental value	Environmental factors	Management objective
Land	Soil	Minimise the risk of contamination to soils below the site, and offsite movement of contaminants.
Land	Flora and fauna	Minimise the risk of impacts (i.e. indirect) to flora and fauna off the site.
Land	Weeds and pests	Minimise the risk of weeds and pests escaping to surrounding areas.
Land	Flooding	Minimise the risk of increased flooding associated with increased hardstand area.
Land	Sedimentation and erosion	Minimise the risk of sedimentation and erosion.
Land	Waste generation	Identify ways to reduce waste where possible and ensure it is correctly disposed to avoid contamination to land.
Air	Noise	To maintain noise levels below regulated limits for nearby sensitive receptors.
Air	Dust	Minimise the generation of dust during operational activities.
Air	Emissions	To limit emissions to air to below allowable emission limits.
Air	Lighting	To minimise light spread offsite.
Water	Surface water	To manage surface water to limit the risk off pollutants moving offsite.
Water	Groundwater	To minimise the risk of impacts to groundwater, especially through the pollutants entering the groundwater.
Water	Aquatic ecology / wetlands	To protect nearby wetlands and waterways from discharges from site.
Water	Sedimentation and erosion	Design the site to minimise the risk of sediment leaving the site or surface water management increasing the potential for erosion to occur.
Social	Tourism	Minimise impact to nearby caravan park.
Social	Amenity	Minimise impact to nearby sensitive receptors (residential properties and caravan park).
Social	Waste generation	Ensure waste is managed to minimise the risk to environmental receptors and in accordance with conditions of approval.
Social	Indigenous heritage	The site is a developed industrial estate. Heritage is not considered to be an applicable factor.

Environmental value	Environmental factors	Management objective
Social	European heritage	The site is developed industrial estate. Heritage is not considered to be an applicable factor.

4.3 Risk Assessment Outcomes

The risk assessment identified several risks associated with the operation of the site. The most significant unmitigated risks (high, very high, extreme) include potential impacts to soil, noise, dust, emissions to atmosphere, surface water, groundwater, and light pollution. Following the identification of management and mitigation opportunities the risk rate for all of these were reduced.

There were limited examples (e.g., surface water) where the risk rating did not change. Management and mitigation typically reduce either the consequence or the likelihood of an event occurring. Sometimes, and this is typically an artifact of the risk matrix being used, a change in the consequence or likelihood may not be sufficient alone to alter the risk rating. The risk assessment drives development of management and mitigation controls and should be considered in the context of the site and operation. In all cases, management and mitigation was identified that reduced either the consequence or the likelihood rating. This detail is just as important to considered as the overall risk rating.

4.3.1 Surrounding Land uses

The nearby sensitive receptors (caravan park and residential properties) have the potential to be impacted by several aspects of the project including noise, reduction in air quality and visual amenity.

Future adjacent industrial developments, and their workers, also the potential to be impacted by the Project.

4.3.2 Climate and Meteorology

Potential impacts to climate were not specifically considered as part of this assessment. However, engineering and design are actively identifying ways to incorporate sustainability considerations into the project.

4.3.3 Air Quality

SLR's (2024a) air quality impact assessment for sensitive receptors of the proposed QRCUF facility predicted air quality characteristics were assessed for compliance against the following legislation and guidelines:

- Townsville City Plan (City of Townsville 2020) – Table 6.2.1.3
- *Queensland Environmental Protection Act 1994*
- *Queensland Environmental Protection (Air) Policy 2019*
- Queensland Odour Impact Assessment Guideline
- Guidelines for Separation Distances

Emissions associated with the operation of the facility include gaseous (exhaust gases), particulate (dust) and odour (SLR, 2024a).

Exhaust gases are produced as part of the process and include carbon dioxide (CO₂), ammonia (NH₃), oxides of nitrogen (NO_x) and sulfur oxides (SO_x). Without mitigation exhaust gases are expected to exceed regulatory limits (SLR, 2024a).

Sources of particulate matter include material storage and handling activities at the stockpile, vehicle movements around site, emissions from other handling activities and wind erosion from the stockpile (SLR, 2024a). Without mitigation particulate, or dust, emissions may not necessarily impact nearby sensitive receptors but are likely to cause a nuisance or health and safety impact to workers on site (SLR, 2024a).

Potential odour generation at the site is most likely associated with sulphur oxides (SO_x) and ammonia (NH₃). Without mitigation, the potential odour impact significance on the high sensitivity receptors (residential areas) was deemed to be of moderate magnitude (impact is predicted to possible cause statutory objectives/standards to be exceeded) (SLR, 2024a).

Design and emission information was provided and incorporated into dispersion modelling. Dispersion modelling of emissions from the Development site showed that predicted impacts at all existing residential receptors and potential future industrial receptors are well below the relevant criteria for all pollutants assessed (SLR, 2024a).

4.3.4 Noise

A noise model was developed in order to predict representative industrial and operational activities at the proposed development to assess potential noise emission onto surrounding noise sensitive receptors to confirm acceptable noise levels are achieved against the adopted EPP Noise 2019 Acoustic Quality Objectives (referenced to the EP Act 1994). In satisfying the requirements of the EPP Noise, it is considered the Townsville City Plan and Development Scheme for the Townsville State Development Area will also be satisfied. (SLR 2024b).

Associated noise activities modelled and assessed were mobile plant (vehicle activities), Internal Plant (Process building operations) and expected mechanical plant (air conditioning and ventilation) (SLR 2024b).

Noise predictions as part of this assessment show that noise intrusive activities from the development are expected to comply with the noise criteria during day, evening, and night periods with the inclusion of noise control recommendations (SLR 2024b).

4.3.5 Flora and Vegetation

It is considered unlikely there will be any significant impacts to flora and vegetation on the site as it is cleared and developed. There is a potential risk to adjacent flora and vegetation as a result of poor weed and pest control during operational activities.

4.3.6 Biodiversity and Conservation Values

It is considered there are no impacts to biodiversity and conservation values as the site is cleared and developed.

4.3.7 Fauna

It is considered there are no direct impacts to fauna as the site is cleared and developed. Some interaction with fauna may occur during operational activities.

4.3.8 Surface water, Wetlands and Waterways

Potential impacts to nearby wetlands and waterways are associated with discharges from site of contaminated surface water, spills or the spread of weeds and pests.

4.3.9 Groundwater

Potential impacts to groundwater are generally associated with spills or leaks of hazardous materials that occur over time.

4.3.10 Heritage

Due to the developed nature of the site, it is not expected there will be any impacts to cultural heritage values.

Table 4-3: Summary of risk assessment outcomes and proposed management and mitigation strategies

Key Environmental Value	Environmental Factor	Site Context	Risk Description	Unmitigated Risk	Management and Mitigation	Risk After Mitigations
Land	Soil	Largely sealed site areas post development. There will be some soft landscaping / grassed area post development, but largely sealed.	Contamination through spills of hazardous materials onsite.	High	<ul style="list-style-type: none"> Design includes appropriately designed and bunded chemical and hazardous material storage, and stormwater/surface water management structures EMP to be prepared to manage operational activities 	Moderate
	Flora and vegetation	Site is already cleared with no flora and vegetation mapped within project boundary so no risk to flora and vegetation within site boundary.	Damage or removal of protected flora and vegetation adjacent to site or impact through spread of weeds or hazardous material spills.	Low	<ul style="list-style-type: none"> EMP will be developed to manage operational activities. This will include flora and vegetation controls however these likely limited to inspecting outside boundary for impacts associated with weeds and pests 	Low
	Weeds and pests	Cleared and largely sealed site.	Spread of weeds or pests that impact native/protected species/ecosystems adjacent to the site.	Low	<ul style="list-style-type: none"> EMP will be developed to manage operational activities. This will include vehicle hygiene, site management of weeds and pests, and waste (i.e., putrescible) management for site 	Low
	Fauna	<p>Cleared site, no fauna habitat or mapped fauna on site.</p> <p>Site near to wetlands and coastal areas e.g., migratory/nesting birds. Ecological information to determine the level of impact is unknown.</p>	<p>Fauna getting entrapped or injured during site activities.</p> <p>Potential for impacts to animal behaviour due to light spill from the site.</p>	Low	<ul style="list-style-type: none"> EMP will be developed to manage operational activities. This will include controls to manage fauna interactions on site in the event they occur If potential impacts to nighttime animal behaviour confirmed, design can incorporate mitigation features 	Low

Key Environmental Value	Environmental Factor	Site Context	Risk Description	Unmitigated Risk	Management and Mitigation	Risk After Mitigations
	Sedimentation and erosion	Site is already cleared, flat and will be largely sealed.	Mud/dirt tracking onto public roads, unauthorised discharge has the potential to erode adjacent banks resulting in sedimentation in the nearby waterway.	Moderate	<ul style="list-style-type: none"> Site design (e.g., civil, stormwater) is being developed to manage potential causes of erosion and sedimentation EMP will be developed for the site to manage operational activities. This will include manage of stockpiles, vehicle hygiene (e.g., dirt) and stormwater 	Low
	Waste generation	Range of wastes generated at the site from general rubbish to hazardous waste products and tailings.	Pollution of land/water, regulatory notice, impacts to fauna.	Very high	<ul style="list-style-type: none"> Site specific waste management strategy is being prepared as part of the design phase. This will be refined into a waste management plan that specifically identifies and describes how each waste stream, including process waste, will be managed 	Moderate
Air	Noise	Noise generated at the site will exceed night-time noise criteria.	Regulatory/permit breach, impacts to sensitive receptors (residential and caravan park).	Very high	<ul style="list-style-type: none"> Noise management is being incorporated into the design (e.g., building materials and structures) to limit the amount of noise leaving the site EMP will be developed to manage operational activities. This will include behavioural expectations, management of noise generating activities and operational hour limitations 	Low

Key Environmental Value	Environmental Factor	Site Context	Risk Description	Unmitigated Risk	Management and Mitigation	Risk After Mitigations
	Dust	Roads and site sealed. Dust generation from stockpiles and plant/equipment and process operations.	Regulatory/permit breach, fauna/flora impacts, impact to people on site.	High	<ul style="list-style-type: none"> Site design incorporates physical and operation procedures to incorporate dust controls EMP will be developed to manage operational activities. This will include dust management and mitigation of specific activities 	Moderate
	Emissions	Emission from process operations.	Regulatory non-conformance. Unmanaged emissions likely to exceed EPP air quality limits.	Extreme	<ul style="list-style-type: none"> Site design incorporates emissions controls (e.g., scrubbers, dust bags) EMP will be developed to manage operational activities. This will include monitoring of emissions points to ensure emissions are within required limits 	Low
Water	Surface water	Largely sealed site, closest waterway is 120m away from site.	Uncontrolled discharges from site may result in negative impact to water quality or increased water flow velocities.	High	<ul style="list-style-type: none"> Design includes appropriately designed and banded chemical and hazardous material storage, and stormwater/surface water management (e.g., capture, retention, and treatment) EMP will be prepared to manage operational activities. This will include surface and stormwater management monitoring 	Low*

Key Environmental Value	Environmental Factor	Site Context	Risk Description	Unmitigated Risk	Management and Mitigation	Risk After Mitigations
	Groundwater	Geotech investigation indicates groundwater is at approximately 2.5-3.2mbelow ground level. This should be considered indicative only. Site will be sealed. No known GDEs.	Spills and/or leaks of hazardous materials has the potential to contaminate groundwater.	High	<ul style="list-style-type: none"> Design includes appropriately designed and bunded chemical and hazardous material storage, and stormwater/surface water management (e.g., capture, retention, and treatment) to minimise the potential for discharge and interaction with groundwater EMP will be prepared to manage operational activities. This will include management and monitoring of mitigation and controls that have the potential to interact/impact groundwater 	Low
Social	Visual amenity	<p>Height of stacks impacting visual amenity of community.</p> <p>Sensitive receptors are near to the site. Lighting from the plant without mitigation can negatively impact the community.</p>	Community complaints about visual amenity.	Low	<ul style="list-style-type: none"> Stacks will be designed in accordance with required restrictions If identified as an actual risk, design can incorporate light mitigation features 	Low

Key Environmental Value	Environmental Factor	Site Context	Risk Description	Unmitigated Risk	Management and Mitigation	Risk After Mitigations
	Odour	Sensitive receptors (Caravan Park 455m) identified within the recommended separation distance of 500m.	Community complaints about amenity or odour / health effects on community and site workers depending on concentration and exposure.	Low	<ul style="list-style-type: none"> Process design incorporates mitigation controls (e.g., scrubbers to reduce the risk of odour associated with emissions) Site specific waste management strategy prepared. This will be refined into a waste management plan that specifically identifies and describes how each waste stream, including putrescible waste, will be managed 	Low
	European and indigenous	Pre-existing cleared site in an established Industrial area. Fill already present.	Damage to Indigenous and non-Indigenous artefacts.	Low	<ul style="list-style-type: none"> CEMP will be developed for operational activities. This will include management strategies in the event site works (post construction) encounter items of cultural heritage 	Low

4.4 Management and Mitigation

Management and mitigation of potential impacts to KEVs has been approached from two opportunity perspectives. Where possible, the first, and primary opportunity, has been to incorporate management and mitigation strategies into design features as part of the site, building and process designs. The second strategy will be to develop an Environmental Management Plan (EMP) to identify and describe management and mitigation strategies targeting behavioural and activity aspects of site operations.

Management and mitigation strategies have been listed in Table 4-3 and will continue to be evolved and refined as the design progresses.

Management and mitigation strategies have also been summarised below.

4.4.1 Surrounding Land Uses

Management of potential impacts to surrounding land uses is principally being addressed in response to specific environmental values, such as air quality, noise, and visual amenity.

4.4.2 Climate and Meteorology

Engineering and design are actively identifying ways to incorporate sustainability considerations into the project. Opportunities being explored include waste reduction strategies and building design (e.g., material choice and structure incorporations) to enable future incorporation of more sustainable energy generation. These will continue to be refined as the project progresses.

4.4.3 Air Quality

Emissions mitigation principally incorporates dust control devices and scrubbers on the process, and dust control strategies during operational activities. Design is continuing to progress on these elements; however, the intent is that regulatory limits will be achieved. Consultation with the suppliers of the scrubbers, for example, has indicated that once discharge limits are known their final scrubber design to be supplied will meet the criteria.

4.4.4 Noise

Noise mitigation strategies include absorptive building materials for sound insulation, shielding of mechanical equipment (e.g., air conditional and other mechanical plant) from sensitive receptors and operational limitations. Modelling undertaken indicates that with these mitigation measures incorporated into the design the facility will meet the required noise limit criteria.

4.4.5 Flora and Vegetation

No specific management and mitigation strategies are proposed as part of site, building and process design. Indirectly, it is expected weed and pest strategies will be developed as part of operational management.

4.4.6 Biodiversity and Conservation Values

No specific management and mitigation strategies are proposed as part of site, building and process design. Indirectly, it is expected weed and pest strategies will be developed as part of operational management.

4.4.7 Fauna

No specific management and mitigation strategies are proposed as part of site, building and process design. Indirectly, it is expected fauna management strategies will be developed as part of operational management in the event interactions occur onsite during operations.

4.4.8 Surface water, Wetlands and Waterways

Potential impacts to nearby wetlands and waterways are associated with discharges from site of contaminated surface water, spills or the spread of weeds and pests.

The Project is designing site specific surface and stormwater management as part of the design. This includes appropriately bunded areas around hazardous materials and a first flush system that will be designed to capture water for treatment prior to discharge from the site. Roof water will be piped underground directly to the treatment system. In order to provide adequate quality treatment, an underground stormwater cartridge filter system is currently proposed near the outlet pipe.

4.4.9 Groundwater

No specific groundwater management and mitigation strategies are being implemented. However, the site will be sealed, surface and stormwater will be managed prior to discharge from the site. Hazardous material stored onsite will be contained in appropriately bunded and managed storage areas.

Operational management strategies will also include appropriate spill response measures.

4.4.10 Heritage

No specific cultural heritage management and mitigation measures are being designed into the site. It is expected an EMP will be prepared for operational activities, this will have a suitable cultural heritage management section.

5 References

Bureau of Meteorology (2024) Bureau of Meteorology website www.bom.gov.au Accessed 15/03/2024. Australian Government, Canberra.

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<http://planning.statedevelopment.qld.gov.au/planning-framework/mapping> Accessed 15/03/2024. Queensland Government, Brisbane.

PGI North Qld (2024) *PGC1822188 QRCUF, Penelope Road CBIP Sedgman – Report on Geotechnical Investigations*. Townsville, Queensland.

SLR (2024a). *Townsville Common User Facility - Air Quality Impact Assessment V2.1*. SLR, Brisbane.

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<https://qldglobe.information.qld.gov.au/> Accessed 15/03/2024. Queensland Government, Brisbane.

Appendix A

Protected Matters Search Tool Results



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 25-Mar-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	46
Listed Migratory Species:	51

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	50
Whales and Other Cetaceans:	2
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	11
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status	Buffer Status
Great Barrier Reef	QLD	Declared property	In buffer area only

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status	Buffer Status
Natural			
Great Barrier Reef	QLD	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity	Buffer Status
Bowling green bay	Within 10km of Ramsar site	In feature area

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat likely to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only
MAMMAL			
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petauroides minor Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Saccolaimus saccolaimus nudicluniatus Bare-rumped Sheath-tailed Bat, Bare-rumped Sheath-tail Bat [66889]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus paedoglauca Mt Stuart Ironbark [56188]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leichhardtia araujacea [91900]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leichhardtia brevifolia listed as Marsdenia brevifolia [91893]	Vulnerable	Species or species habitat may occur within area	In feature area
Myrmecodia beccarii Ant Plant [11852]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Omphalea celata [64586]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Tephrosia leveillei [16946]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only
Varanus mertensi Mertens' Water Monitor, Mertens's Water Monitor [1568]	Endangered	Species or species habitat may occur within area	In feature area

SHARK

Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat may occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In buffer area only
Sousa sahalensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In buffer area only
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area	In buffer area only
Whales and Other Cetaceans [Resource Information]			
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			

Current Scientific Name	Status	Type of Presence	Buffer Status
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat may occur within area	In buffer area only
Sousa sahalensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State	Buffer Status
Cleveland Bay	Fish Habitat Area (A)	QLD	In buffer area only
Cleveland Bay - Magnetic Island	Dugong Protection Area (A)	QLD	In buffer area only
Stuart Creek	Nature Refuge	QLD	In buffer area only

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State	Buffer Status
Burdekin - Townsville Coastal Aggregation	QLD	In feature area

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Stuart Industrial Subdivision	2021/8890		Post-Approval	In buffer area only
WITHDRAWN BEFORE VALIDATION Cleveland Bay	2020/8733		Referral Validation	In feature area

Controlled action

Cleveland Bay Industrial Park	2020/8810	Controlled Action	Post-Approval	In feature area
North Queensland Power Project	2001/412	Controlled Action	Completed	In buffer area only
Townsville Eastern Access Rail Corridor	2021/9003	Controlled Action	Assessment Approach	In buffer area only
Townsville Port Access Project (Road and Rail)	2003/1011	Controlled Action	Post-Approval	In feature area

Not controlled action

Cleveland Bay Purification Plant Outfall Upgrade Project, Townsville, Qld	2016/7821	Not Controlled Action	Completed	In buffer area only
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Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Cleveland Bay WasteWater Treatment Facility and Water Reclamation Facility	2006/2882	Not Controlled Action	Completed	In buffer area only
Construction & operation of new intermodal terminal & freight distribution, Townsville, Qld	2015/7424	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Townsville South to East power line & substation	2006/2626	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
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- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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Appendix B

Environmental Management Register / Contaminated Land Register Results



Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Dye & Durham
Level 6, West Tower, 410 Ann St
Brisbane QLD 4000

Transaction ID: 50852575 EMR Site Id: 19 April 2023
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 14 Plan: SP338024
109 PENELOPE RD
STUART

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Appendix C

Bore RN 186008 Report

Queensland Government
Groundwater Information
Bore Report

Report Date: 01/02/2024 15:49

From Year:

Registered Number	Facility Type	Facility Status	Drilled Date	Office	Shire
186008	Sub-Artesian Facility	Existing	16/05/2018	Ayr	7010 - TOWNSVILLE CITY

Details			Location			
Description			Latitude	19-19-12	Basin	1181
Parish	6000 - NO LONGER USED		Longitude	146-50-16	Sub-area	
Original Name	DOMESTIC		GIS Latitude	-19.32	Lot	2
			GIS Longitude	146.83777778	Plan	SP275824
			Easting	482959		
Driller Name	NEWTON, GILBERT		Northing	7863757	Map Scale	
Drill Company	TOWNSVILLE WATER BORES		Zone	55	Map Series	
Const Method	ROTARY AIR		Accuracy	GPS	Map No	
Bore Line			GPS Accuracy	20	Map Name	
D/O File No	NOR/078805	Polygon	Checked	Yes	Prog Section	
R/O File No		Equipment				
H/O File No		RN of Bore Replaced				
Log Received Date	10/09/2018	Data Owner	DNR			
Roles	Water Supply					

Casing 4 records for RN 186008

Pipe	Date	Rec	Top (m)	Bottom (m)	Material Description	Mat Size (mm)	Size Desc	Outside Diameter (mm)
A	16/05/2018	1	0.00	11.70	Polyvinyl Chloride	5.900	WT - Wall Thickness	125
A	16/05/2018	2	8.20	11.70	Perforated or Slotted Casing	1.000	AP - Aperture Size	125
X	16/05/2018	3	5.00	12.00	Cuttings or other fill between casing and hole wall			200
X	16/05/2018	4	0.00	5.00	Grout			200

Strata Logs 4 records for RN 186008

Report Date: 01/02/2024 15:49

Groundwater Information

GWDB8250

Bore Report

From Year:

Rec	Top (m)	Bottom (m)	Strata Description
1	0.00	5.00	BROWN CLAY
2	5.00	6.00	SANDY CLAY
3	6.00	11.00	COARSE SAND - WATER @ 6 METRES
4	11.00	12.00	COARSE SAND AND STONES

Stratigraphies

0 records for RN 186008

Aquifers

1 records for RN 186008

Rec	Top (m)	Bottom (m)	Lithology	Date	SWL (m)	Flow	Quality	Yield (L/s)	Contr	Cond	Formation Name
1	6.00	11.00	SAND - Sand	16/05/2018	-5.00	N	BRACKISH	2.00	Y	XX	

Pump Tests Part 1

0 records for RN 186008

Pump Tests Part 2

0 records for RN 186008

Bore Conditions

0 records for RN 186008

Elevations

0 records for RN 186008

Water Analysis Part 1

0 records for RN 186008

Water Analysis Part 2

0 records for RN 186008

Water Levels

0 records for RN 186008

Wire Line Logs

0 records for RN 186008

Field Measurements

1 records for RN 186008

Pipe	Date	Depth (m)	Conduct	pH	Temp	NO3 (mg/L)	DO2	Eh (mV)	Alkalinity	Samp Method	Samp Source
------	------	-----------	---------	----	------	------------	-----	---------	------------	-------------	-------------

From Year:

			(uS/cm)	(C)	(mg/L)	(mV)				
A	16/05/2018	12.00	6000	7.8			AI	Air Lifting	GB	Groundwater - from Bore

Special Water Analysis

0 records for RN 186008

From Year:

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