

WEED MANAGEMENT PLAN
VULCAN SOUTH COAL MINE
Tenure number: ML700073

December 2024

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Appendix A List of environmental weeds





1 Introduction

Vulcan South (VS) is an open pit and highwall mining operation being undertaken by Vitrinite Pty Ltd (Vitrinite). VS is located within the Bowen Basin, Queensland, and falls within the jurisdiction of the Isaac Regional Council (IRC).

The Queensland State Environmental Authority (EA) P-EA-100265081 requires a weed management plan to be developed prior to commencement of mining activities and implemented for the duration of the Project.

The Commonwealth's EPBC2023/09708 approval conditions for VS requires this Weed Management Plan (WMP) to be implemented until the approval expiry date (31 December 2055).

1.1 Context

The Project will be undertaken on mining lease (ML) 700073 and under Environmental Authority (EA) number P-EA-100265081. Queensland Coking Coal Pty Ltd and QLD Coal Aust No. 1 Pty Ltd are the joint holders of this EA, and both companies are owned by Vitrinite. In addition to Vitrinite's obligations under the EA, the *Biosecurity Act 2014* holds Vitrinite responsible for controlling weeds within the ML.

The areas designated as disturbance and avoidance areas (habitat outside the approved disturbance area) by EPBC2023/09708 are shown on **Figure 1-1**.

The layout as approved by the EA is shown on **Figure 1-2**.

1.2 Purpose

This Weed Management Plan (the Plan) describes the objectives, management measures and monitoring program in place to manage weeds on ML 700073 during construction, operation and rehabilitation activities of the VS.

The Plan focuses on weeds that are listed as restricted matters under the *Biosecurity Act 2014*, Isaac Regional Council's invasive species priority list (IRC, 2024), as well as any non-native plant species with high-risk potential to disrupt the habitat of threatened species of plant or fauna, or the success of native vegetation or grazing pasture rehabilitation.

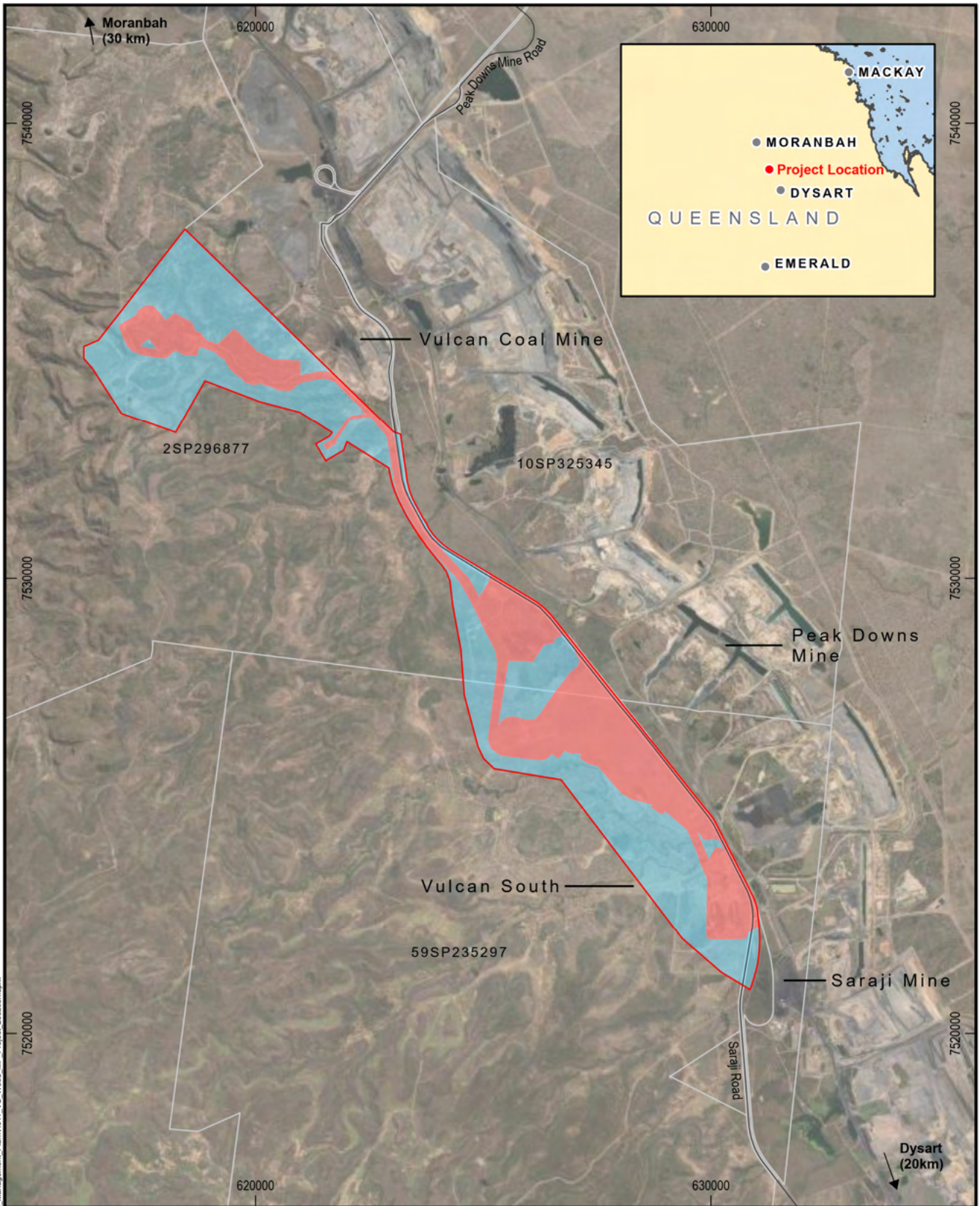
In addition to Vitrinite's corporate responsibility under the *Biosecurity Act*, the Act imposes a **general biosecurity obligation**, known as the GBO, on each person to manage biosecurity risks in their control and prevent biosecurity events from occurring. Everyone must take all reasonable and practical measures to prevent or minimise biosecurity risks, such as those presented by invasive plants and animals.

Whilst non-human factors, such as movement of animals, water flow and wind, can be major vectors for the spread of weed seeds, mining activities including land disturbance and the movement of soils, vehicles and people between areas can promote weed invasion or spread.

The GBO requires all Vitrinite employees, contractors and visitors to take responsible and practical measures to minimise the biosecurity risks posed by their actions while working or visiting the VS. All persons must:

- minimise the likelihood of causing a 'biosecurity event';
- limit the consequences if such an event is caused by preventing or minimising the harmful effects a risk could have; and
- not do anything that might make any harmful effects worse.





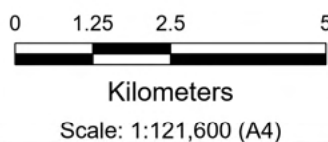
Path: S:\Projects\0011_VCP_Stage2\ArcGIS\ProjectFiles\Project\Weed_Management_Plan\0011_VS_Weed_MP_Project_Location.aprx

Legend

- Road
- Cadastral Boundary
- Project Area (ML 700073)
- Disturbance Footprint
- Avoidance Area

Source: Population centres - Queensland, State of Queensland (Department of Resources) 2020; QLD Roads and Tracks, State of Queensland (Department of Resources) 2021; Cadastral data weekly - whole of State Queensland, State of Queensland (Department of Resources) 2022; Vulcan South and Vulcan Coal Mine Datasets, Vitrinite & M&E I Serve 2022-2024; Imagery - Geosciences Australia, Esri, GEBCO, Garmin, NaturalVue, Earthstar Geographics.

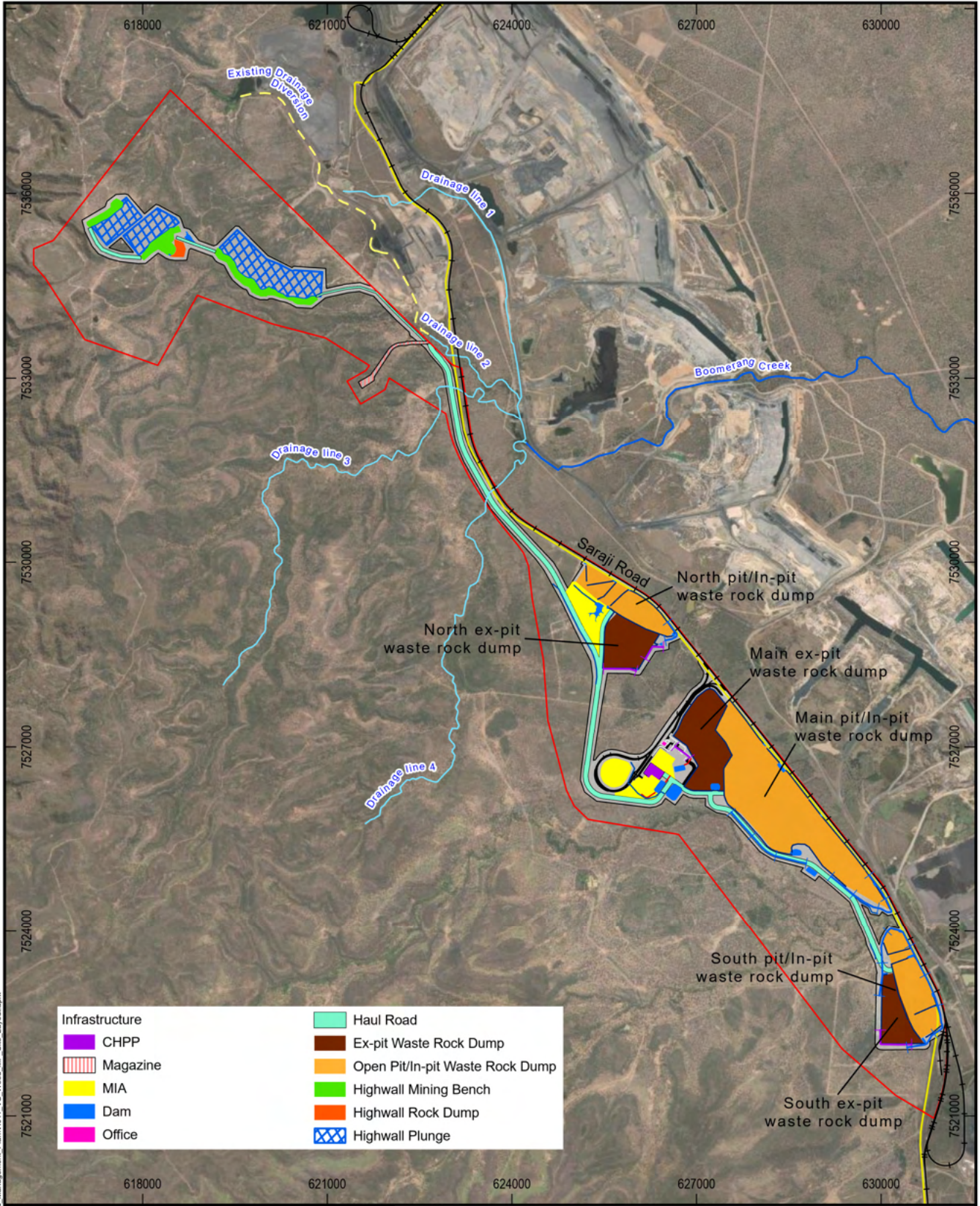
**Vulcan South
Project Location**



19/12/2024

Datum: GDA2020
Projection: MGA55

FIGURE 1-1



Infrastructure	
	CHPP
	Magazine
	MIA
	Dam
	Office
	Haul Road
	Ex-pit Waste Rock Dump
	Open Pit/In-pit Waste Rock Dump
	Highwall Mining Bench
	Highwall Rock Dump
	Highwall Plunge

Legend	
	Railway
	Road
	Rail Loop and Mine Roads
	Mine Access Road
	Flood Levee
	Diversion Bund
	Diversion Drain
	Mine Water Drain
	Surface Water Drain
Local Drainage Features	
	Drainage Features
	Drainage Diversion
	Watercourse
	Project Area (ML 700073)
	Disturbance Footprint

Source: QLD roads and tracks - State of Queensland (Department of Resources) 2021; Rail network - QLD - State of Queensland (Department of Resources) 2024; Watercourse lines - QLD - State of Queensland (Department of Resources) 2024; Infrastructure - Vitrinite, WRM and METSERVE 2022-2024; Imagery - Earthstar Geographics, Maxar.

Vulcan South

Approved Disturbance Layout

Kilometers

Scale: 1:90,000 (A4)

19/12/2024

Datum: GDA2020
Projection: MGA55

FIGURE 1-2

Path: S:\Projects\00111_VCP_Stage2\GeoSIS\ProjectFiles\Projects\Wood_Management_Plan\00111_VS_Weed_MP_Site_Layout.aprx



2 Regulatory Environment, Guidelines and Agreements

Vitrinite’s statutory obligations under the *Environmental Protection Act 2019* pertaining to weed management are contained within the Vulcan South EA conditions, and the PRCP Schedule. The *Biosecurity Act 2014* is Queensland’s primary legislation for management of invasive plants.

The Commonwealth Government has included conditions associated with weed management to protect matters of national significance. 32 invasive plant species are classed as Weeds of National Significance (WoNS) by the Australian Government. While this classification does not introduce additional restrictions, it acts to coordinate management across states.

The Queensland Government guideline documentation assists landholders manage their obligations under the *Biosecurity Act 2014*, supplemented by the *Isaac Region Biosecurity Plan* issued by the local government authority, Isaac Regional Council.

The Vulcan South ML overlies an operational pastoral lease, with Vitrinite required to have a Conduct and Compensation Agreement in place with the landholder. These are summarised below.

2.1 Environmental Protection Act 2019

2.1.1 Environmental Authority Requirements

The EA contains a condition (G9) that specifies the preparation of a weed management plan, and describes the information to be contained within this plan (**Table 2-1**). In addition, condition G9 requires, for all mining activities, that all vehicles and equipment be used in a manner which prevents the spread of weeds. Vitrinite is bound by the *Environment Protection Act 1994* to adhere to all conditions of its EA.

Table 2-1 Conditions of the EA pertaining to weed management

Condition number	Condition	Section in this Plan
G9	Weed Management <i>A weed management plan must be developed prior to the commencement of authorised activities and implemented for ML700073 for the duration of authorised activities and must outline:</i>	
	(a) <i>areas of control priority and the methods used to determine such areas</i>	Section 3
	(b) <i>strategies to promote dense pasture cover (to decrease weeds establishment) through reduced disturbance</i>	Section 5.1.7
	(c) <i>monitoring methodologies that document the spread of weeds and any new outbreaks</i>	Section 5.6
	(d) <i>methods for the control of weeds that include best practice management</i>	Section 5.2 Section 5.3
	(e) <i>stringent wash-down and inspection procedures for both machinery involved in clearing/construction activities and those operating outside of designated roads during mine operation</i>	Section 5.1 Section 5.4
	(f) <i>truck wash procedure to reduce weed infestations</i>	Section 5.1 Section 5.4
	(g) <i>protocol for an annual weed inspection</i>	Section 5.6.3 Section 5.6.4
	(h) <i>promotion of the awareness of weed management issues at the site.</i>	Section 5.4

2.1.2 Progressive Rehabilitation and Closure Plan and Schedule

The approved Vulcan South Progressive Rehabilitation and Closure (PRC) Plan METServe (2024c) describes, among other aspects of mine rehabilitation, management measures pertaining to weed management. While these weed management measures contained within the rehabilitation planning section of the PRC Plan are not legally binding,



conditions within the PRCP Schedule (the second component of the PRC Plan) must be complied with under sections 431B and 431C of the *Environment Protection Act 1994*. Successful compliance with the PRCP Schedule is generally contingent on adherence to the management commitments made within the rehabilitation planning section of the PRC Plan.

The PRCP P-EA-100265081 Schedule compliance requirements for weeds are shown in Table 2-2.

Table 2-2 PRCP-P-EA-100265081 Schedule compliance weed density requirements

Milestone criteria reference	Milestone criteria
RM6.2	Rehabilitated areas have:
RM7.1	(a) $\leq 0.2\%$ cover of <i>Parthenium hysterophorus</i> AND
RM8.1	(b) $\leq 0.1\%$ cover of <i>Harrisia martini</i> AND
RM9.10	(c) any other weeds listed under the <i>Biosecurity Act</i> are to be present in densities of < 1
RM10.9	individual per hectare as confirmed by an appropriately qualified person (AQP) from annual monitoring.

As there is a temporal overlap between the rehabilitation and operational phases of the VS, it is appropriate for any weed management measures adopted for rehabilitation to be implemented through all phases of the VS.

The following are weed management commitments contained within the PRC Plan which are generally incorporated across the VS approvals including this WMP:

- Section 5.1: One of the rehabilitation objectives for ‘Low intensity cattle grazing’ and ‘Native eco-systems riparian’ and ‘Native eco-systems non-riparian’ is that “Weeds listed under the Queensland *Biosecurity Act 2014* are not to exceed densities typically present in unmined, grazed landscapes within the ML and neighbouring areas.” This is to be assessed using “percentage cover within a 10 m × 50 m plot”, as measured “between February and April, every two years for ten years after planting”.
- Section 5.1: One rehabilitation completion criterion is that “Rehabilitated areas have $\leq 0.2\%$ cover of *Parthenium hysterophorus* AND rehabilitated areas have $\leq 0.1\%$ cover of *Harrisia martinii* AND any other weeds listed under the *Biosecurity Act* are to be present in densities of < 1 individual per hectare”.
- Section 6.3.1: One revegetation objective is “to limit invasion by declared weed species to levels that are similar to those on site prior to mining or representative of adjacent areas”.
- Section 6.3.4: “Stockpiles are to be monitored annually for weeds and control measures implemented as appropriate”.
- Section 8: To reduce the risk posed by vehicles contaminated with weed seed, there are to be “strict vehicle wash-down practices for vehicles entering the site from contaminated areas [and an] annual weed monitoring program, to allow the early detection and treatment of new weed infestations”.
- Section 9.1.7: “Percentage cover of declared weeds... to be measured within a 10 m × 50 m belt transect installed within rehabilitation areas... The entire belt transect is to be searched, and all species of forbs and grasses contained within it are to be recorded. Percentage ground cover of each species is to be estimated to the nearest 0.1%, with 0.1% cover being equivalent to 0.5 m² total cover within the transect. From this data, milestone criteria pertaining the grass species richness and weed cover can be assessed”. “Field surveys are to be undertaken in the late wet season (February-May), to coincide with maximum growth of grasses and forbs. Permanent monitoring sites are to be installed within all rehabilitation areas, and each end of each transect is to be marked with a star picket. An average of one monitoring site is to be installed per 10 ha of rehabilitated land.”
- Section 10.3 (milestone criteria listed in the PRCP schedule and thereby constituting a condition of the VS): “Rehabilitated areas have $\leq 0.2\%$ cover of *Parthenium hysterophorus* AND $\leq 0.1\%$ cover of *Harrisia martini* AND any other weeds listed under the *Biosecurity Act* are to be present in densities of < 1 individual per hectare, as confirmed by an appropriately qualified person from annual monitoring.”



2.2 Biosecurity Act 2014

The *Biosecurity Act 2014* is the Queensland Government’s principal instrument for governing the management of weeds and other invasive species along with the *Biosecurity Regulation 2016*.

Schedule 1 and Schedule 2 of the *Biosecurity Act 2014* list species that are prohibited or restricted matters, respectively.

Prohibited matters are not found in Queensland but, if they were to enter, would have serious environmental, economic or lifestyle impacts. Under section 36 of the *Biosecurity Act 2014*, if a person becomes aware of the presence of a prohibited matter in a place they occupy or control, the person must advise an inspector without delay. Furthermore, the person must not take any action reasonably likely to exacerbate, and must take any action reasonably likely to minimise, the biosecurity risk posed by the prohibited matter.

Business Queensland provides information on prohibited invasive plants at [Prohibited invasive plants | Business Queensland](#).

Restricted matters are currently present and perhaps widespread in the state, but reduction, control or containment is required to prevent adverse impacts. Schedule 2, Part 2 ‘Restricted matter – invasive biosecurity matter’ lists all restricted matter invasive plants and Category number(s) allocated for each species:

- Category 2: the invasive plant must be reported within 24 hours to **Biosecurity Queensland** on 13 25 23.
- Category 3: the invasive plant must not be distributed either by sale of gift, or released into the environment.
- Category 4: the invasive plant must not be moved.
- Category 5: the invasive plant must not be kept.

As introduced in **Section 1.2** of this Plan, Section 23 of the *Biosecurity Act 2014* imposes a general biosecurity obligation, known as the GBO, on each person to manage biosecurity risks in their control and prevent biosecurity events from occurring. Everyone must take all reasonable and practical measures to prevent or minimise biosecurity risks, such as those presented by invasive plants and animals. All persons working at the VS are required to be aware of their GBO and be guided by the content of this Plan with regards to restricted invasive plants.

Section 53 of the *Biosecurity Act 2014* outlines that a local governments must have a biosecurity plan for invasive biosecurity matter for its local government area, and the plan may include provision for each of the following:

- (a) achievable objectives under the plan;
- (b) strategies, activities and responsibilities for achieving the objectives;
- (c) strategies to inform the local community about the content of the plan and achievement of its objectives;
- (d) monitoring implementation of the plan and evaluating its effectiveness;
- (e) other matters the local government considers appropriate for management of invasive biosecurity matter for its local government area.

2.3 Local Government

The *Isaac Region Biosecurity Plan 2024-2027* (Isaac Regional Council 2024) fulfils the requirements of Section 53 of the *Biosecurity Act 2014*. It provides a framework to assist landholders, businesses, government and the public in prioritising their pest plant and animal control obligations within the Isaac LGA. The plants and animals listed in the Plan were prioritised based on a risk-based approach. Prohibited and restricted species designated under the *Biosecurity Regulation 2016* and non-declared pest plants and animals considered of risk to the Isaac Region were assessed. These were then prioritised based on: Likelihood of establishment or spread, capacity to manage, current extent, and level of impact (environmental, social and agricultural).

The *Isaac Region Biosecurity Plan 2024-2027* invasive weed priority list is shown in **Table 2-3**.



Table 2-3 Isaac Region Biosecurity Plan 2024-2027 invasive plant priority list

Invasive Plant	Total impact (average)	Invasiveness	Potential Distribution	Total Risk Score*	Risk Category
Parthenium (<i>Parthenium hysterophorus</i>)	3.75	4	4	60	Very high
Parkinsonia (<i>Parkinsonia aculeata</i>)	3.75	4	4	60	Very high
Prickly Acacia (<i>Vachellia nilotica</i>)	3.75	4	4	60	Very high
Castor Oil Plant (<i>Ricinus communis</i>) †	3.75	4	4	60	Very high
Mimosa Bush (<i>Vachellia farnesiana</i>) †	3.5	4	4	56	Very high
Salvinia (<i>Salvinia molesta</i>)	3.25	4	4	52	Very high
Chinee Apple (<i>Ziziphus mauritiana</i>)	3.25	4	4	52	Very high
Rat's Tail Grass (<i>Sporobolus fertilis</i> , <i>S. jacquemontii</i> , <i>S. natalensis</i> , <i>S. pyramidalis</i>)	3	4	4	48	Very high
Hymenachne (<i>Hymenachne amplexicaulis</i>)	3.5	4	4	48	Very high
Mother-of-Millions (<i>Bryophyllum delagoense</i>)	3	4	4	48	Very high
Lantana (<i>Lantana</i> spp.)	3.75	4	3	45	Very high
Bellyache Bush (<i>Jatropha gossipifolia</i>)	3.5	4	3	42	Very high
Feral Leucaena (<i>Leucaena leucocephala</i>) †	2.5	4	4	40	Very high
Water Lettuce (<i>Pistia stratiotes</i>)	3.25	4	3	39	Very high
Harrisia cactus (<i>Harrisia martinii</i> , <i>H. tortuosa</i> , and <i>H. pomanensis</i> syn. <i>Cereus pomanensis</i>)	3.25	2	3	19.5	High
Rubber Vine (<i>Cryptostegia grandiflora</i>)	2.5	3	2	15	High
Broadleaved Pepper Tree (<i>Schinus terebinthifolius</i>)	1.5	3	3	13.5	Medium
Opuntoid Cacti (<i>Austrocylindropuntia</i> , <i>Cylindropuntia</i> and <i>Opuntia</i> species)	2.25	2	3	13.5	Medium
Captain Cook Tree (<i>Cascabela thevetia</i>)	3	2	2	12	Medium
Athel Pine (<i>Tamarix aphylla</i>)	1.5	1	3	4.5	Negligible

*The scoring systems are described in the *Isaac Region Biosecurity Plan 2024-2027* (Isaac Regional Council 2024).

† Not a restricted weed under the *Biodiversity Act 2014*.

All species are classified as restricted matter under the *Biosecurity Act 2014* with the exception of:

- Castor Oil Plant (*Ricinus communis*)
- Feral Leucaena (*Leucaena leucocephala*)
- Mimosa Bush (*Vachellia farnesiana*)

Given Vitrinite is responsible for weeds within the ML during its tenure, it must also be cognisant of monitoring the presence and density of weeds nominated by the IRC. IRC considers resource companies as stakeholders to the *Isaac Region Biosecurity Plan*.



2.4 Mineral Resources Act

Under the *Mineral Resources Act – Land Access Code*, a resource authority holder must (if asked) provide a landholder with a copy of vehicle / machinery clean-down records. There is no set format for a clean down record. In providing that record, a person may refer to this document to describe the measures taken to perform the clean down.

2.5 Environment Protection and Biodiversity Conservation Act

Vulcan South is subject to approval conditions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The final Public Environmental Report (PER), including appended Terrestrial Ecology Report and Environmental Management Plan, submitted to the Federal Government for EPBC 2023/09708 (METServe, 2024a), incorporated the following management measures, commitments and targets in relation to the risk of weed invasion that may result in impacts to matters of environmental significance (MNES):

- All vehicles that enter undisturbed parts of the site must be washed and certified weed free prior to arrival at the project site, to restrict the introduction of new weeds. Weed management activities must control weeds in high traffic areas.
- Operational areas and the visitor carpark will be inspected one month after heavy rainfall (defined as >20 mm in a 24-hour period) to identify new infestations of restricted weeds. These must be treated within 2 weeks of detection, with follow-up treatment until populations are eradicated.
- Stockpiles must be monitored annually for weeds and control measures implemented to prevent weed colonisation on the stockpiles.
- In-depth weed milestone monitoring completed every two years, including the development of a survey report.
- The Weed Management Plan will contain a Trigger Action Response Plan (TARP).
- Non-native plant cover in native vegetation regional ecosystem vegetation must be <10%.

EPBC 2023/09708 approval conditions that directly relate to this WMP are included in **Table 2-4**.

Table 2-4 EPBC approval conditions relating to weed management

Condition number	Condition
11	<p>Environmental Management Plan</p> <p>(a) Maintenance of the habitat quality of Koala habitat, Greater Glider habitat and Squatter pigeon habitat within the avoidance areas to be equivalent or superior to the habitat quality of that habitat on the date of the approval decision.</p> <p>(b) Progressive rehabilitation of disturbed and cleared areas to achieve habitat quality equal to that of surrounding undisturbed habitat.</p> <p>(c) No degradation of habitat quality of any protected matter or areas being managed in accordance with the Progressive Rehabilitation and Closure Plan.</p>
21	<p>Weed Management</p> <p>The approval holder must submit the approved Weed Management Plan to the department within 5 business days of it being approved by the administering authority under Chapter 5 of the Environmental Protection Act 1994 in accordance with the Queensland Environmental Authority.</p>
22	<p>The approval holder must commence implementing the approved Weed Management Plan from the date it is approved by the administering authority and continue to implement the approved Weed Management Plan until the expiry date of this approval.</p>
23	<p>The approval holder must notify the department in writing, of any proposed change or change to the Weed Management Plan that may relate to protected matters within:</p> <p>(a) 2 business days of formally proposing such a change</p> <p>(b) 5 business days of becoming aware of any proposed change</p> <p>(c) 2 business days of any change to the Weed Management Plan being approved in accordance with the Queensland Environmental Authority. Such notification must include a copy of the changed Weed Management Plan showing what changes have been made.</p>



3 Pre-mining Weed Risk

The following subsections describe the pre-mining weed risk of ML 700073. A total of 65 species of non-native plants were recorded within the local area (a 6,552 ha area surrounding and containing the ML) during the Vulcan Project terrestrial ecology baseline survey undertaken in 2019 (METServe, 2020). This has been supplemented with data gathered during biocondition or weed surveys (METServe, 2019) (METServe, 2024b) (Kleinfelder, 2024).

3.1 Restricted matters

The following category 3 restricted matters under the *Biosecurity Act 2014* have been located within ML700073 or immediate surrounding area during surveys to date:

- *Cryptostegia grandiflora* (Rubber Vine);
- *Harrisia martinii* (Harrisia Cactus);
- *Hymenachne amplexicaulis* (Olive Hymenachne);
- *Jatropha gossypifolia* (Bellyache Bush);
- *Lantana camara* (Lantana);
- *Opuntia stricta* (Common Prickly Pear);
- *Opuntia tomentosa* (Velvety-tree Pear); and
- *Parthenium hysterophorus* (Parthenium).

Of the eight category 3 weeds, three are the most widespread:

- *Parthenium hysterophorus*.
- *Opuntia tomentosa*.
- *Harrisia martinii*.

Locations where these weeds have been identified to date are shown on **Figure 3-4**, **Figure 3-2** and **Figure 3-3**.

The following category 3 species have been identified at isolated locations within the ML to date:

- *Cryptostegia grandiflora*
- *Opuntia stricta*
- *Lantana camara*.

Isolated findings of *Hymenachne amplexicaulis* and *Jatropha gossypifolia* have also been located within 2 km of the ML.

The locations of isolated restricted matters known to date are shown on Error! Reference source not found.4.

All of the above, except *Harrisia martinii*, are also classed as Weeds of National Significance by the Australian Government.

A brief description and images of these eight species is provided in **Table 3-1**.

Full details for restricted plant species can be accessed online.








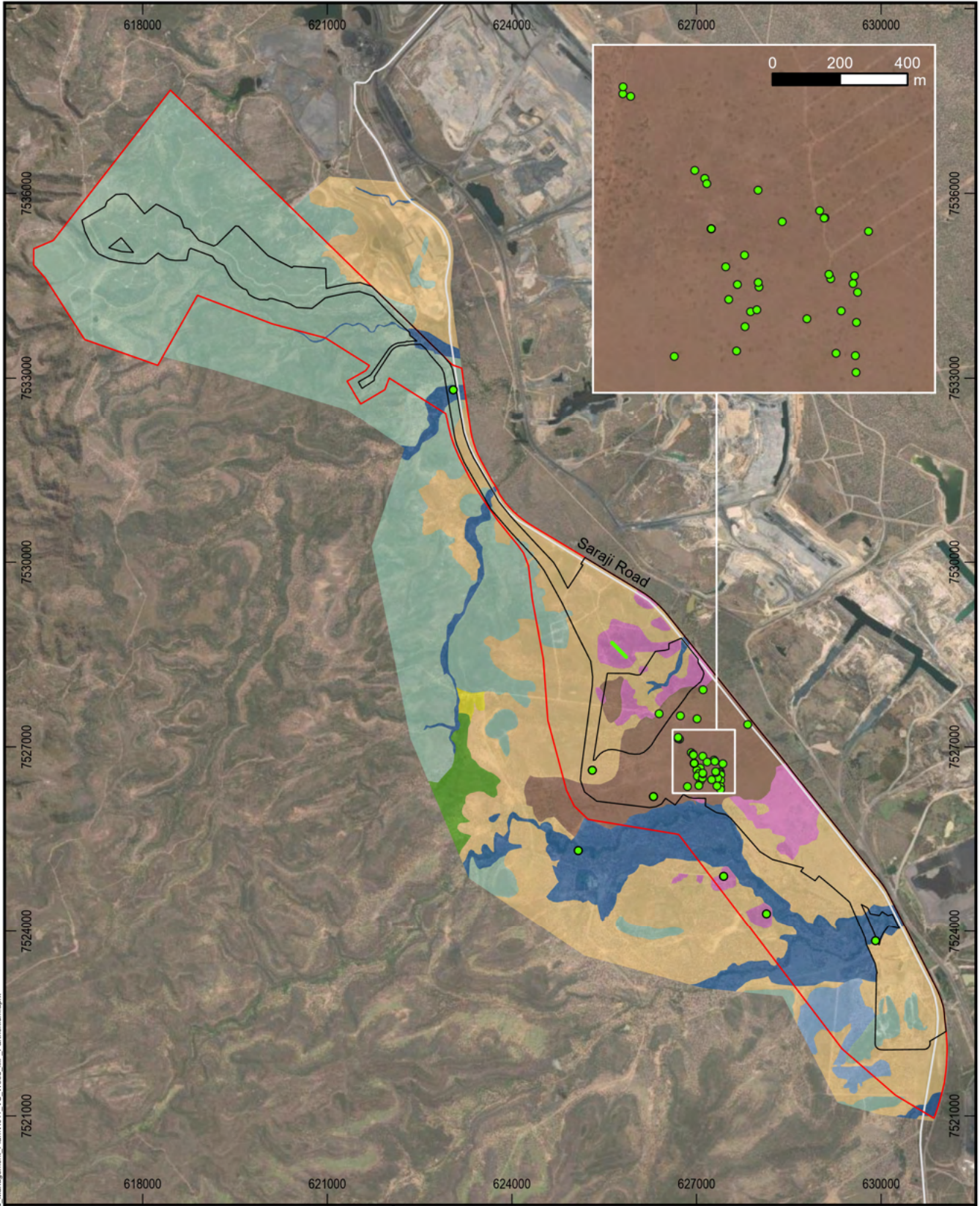
Table 3-1 Restricted weeds known to occur within or adjacent to Vulcan South

Species	Photo	Description
<p><i>Cryptostegia grandiflora</i> (Rubber Vine)</p>		<p>Rubber vine is a vigorous climber with twining, whip-like shoots that can grow unsupported as an untidy, multistemmed shrub 1–2 m high, or it can scramble up to 30 m high in trees.</p> <p>Rubber vine generally invades waterways first, where the seeds germinate in moist silt layers after rain. The plant smothers riparian vegetation and forms dense, sometimes impenetrable, thickets, and can spread outwards, decreasing biodiversity and loss of grazing land.</p>
<p><i>Harrisia martinii</i> / spp (Harrisia Cactus)</p>		<p>Harrisia Cactus is a rope like cactus that forms tangled mats about 0.5m high. It bears a bright red fruit containing 400–1000 small black seeds that germinate soon after rain. Branches take root where they touch the ground and new plants will grow from broken branches and sections of underground tubers. Harrisia cactus can form dense infestations that reduce pastures to a level unsuitable for stock, and interferes with mustering and stock movement.</p>
<p><i>Hymenachne amplexicaulis</i> (Olive Hymenachne)</p>		<p>Hymenachne is a robust, rhizomatous, perennial grass that can grow to a height of 2.5 m. Roots may be produced at the lower nodes. The leaf blades are 10–45 cm long and up to 3 cm wide, and strongly clasp the stem at the leaf base. Flowers heads are spike-like, cylindrical, 20–40 cm long and sometimes branched. Main flowering occurs from April to June. Hymenachne is capable of growing in permanent wetlands in up to 1.2 m depth but can survive in up to 3 – 4m water for several months.</p>
<p><i>Jatropha gossypifolia</i> (Bellyache Bush)</p>		<p>Bellyache bush is a squat, thick-stemmed shrub 2.5–4 m tall developing from a short, single-stemmed plant with three or four young leaves sprouting from the top. Young leaves are deeply divided into three rounded lobes, and are purple coloured and sticky. Older leaves are bright green, about 10 cm in diameter, and may have up to five lobes, the edges covered in coarse, dark brown hairs. Flowers are small, red with yellow centres, found in small clusters throughout the upper part of the plant. Seed pods are smooth and oval, about the size of a cherry and 12 mm across; they contain three to four seeds about 8 mm long. It flowers throughout the year with adequate moisture; seeds germinate October to December.</p>
<p><i>Lantana camara</i> (Lantana)</p>		<p>Lantana camara is a heavily branched shrub that can grow in compact clumps, dense thickets or as a climbing vine. Stems are square in cross section, with small, recurved prickles. Most leaves are about 6 cm long and are covered in fine hairs and produce a distinctive odour. Flowers appear throughout most of the year in clustered, compact heads about 2.5 cm in diameter and vary in colour from pale cream to yellow, white, pink, orange and red. Round, berry-like fruit turns from glossy green to purplish-black when ripe. Flowering and germination occurs all year round but peaks after summer rains. Several thousand seeds can be produced per square metre and these can remain viable for several years. Stems lying on the ground will re-root and grow.</p>



Species	Photo	Description
<p><i>Opuntia stricta</i> (Common Prickly Pear)</p>		<p>This invasive cactus grows up to 1.5 m high and forms large clumps. The stems are divided into oval, blue-green spineless pads 20 cm long and 10 cm wide. Areoles are in diagonal lines along the pads 2.5 cm to 5 cm apart and have a cushion of brown wool containing bristles but usually no spines. When spines occur they are stout, yellow and up to 4 cm long.</p> <p>Flowers are up to 7.5 cm wide, bright lemon yellow, green at the base and sometimes have pinkish coloured markings on the outer petals. Immature fruit is green, oval-shaped, has a deep cavity on one end and tapers at the other. Fruit turns purple as it matures, 6 cm long and 3 cm wide, with carmine-coloured (dark red) seeds and a fleshy pulp. Seeds are 4–5 mm long, 4–4.5 mm wide and are generally yellow to pale brown in colour.</p> <p>Common pest pear reproduces by seed and vegetatively via stem segments. Flowering occurs mostly during spring and summer.</p>
<p><i>Opuntia tomentosa</i> (Velvety-tree Pear)</p>		<p>This tree-like plant forms a central woody trunk over 40 cm wide and grows up to 6 m high. Stems are divided into oblong pads that are dull green and velvety to touch due to dense covering of short fine hairs. The pads are 15–35 cm long, 8–12 cm wide and 1.5–2 cm thick. Young plants have 2–4 white or pale yellow spines located in the areoles with one spine reaching a length of 2.5 cm. The areoles usually become spineless as the plant matures. A more spiny variety does exist and has more than 50 spines in each areole on the trunk. The flowers are a deep orange colour, 4–5 cm long and 4–5 cm wide. The fruit body is egg-shaped, about 5 cm long and 3 cm wide. The top of the fruit is saucer-shaped with circular lines that meet in the centre and give the fruit a shriveled appearance. Fruit are green in colour and turn reddish-purple as they mature. They produce many seeds, 3–5 mm long, within a reddish pulp. It reproduces by seed as well as stem fragments, fallen flowers and immature fruit. Flowering occurs mostly during spring and summer.</p>
<p><i>Parthenium hysterophorus</i> (Parthenium)</p>		<p>Parthenium is an annual herb with a deep tap root and an erect stem that becomes woody with age. As it matures, the plant develops many branches in its top half and may eventually reach a height of 2 m. Its leaves are pale green, deeply lobed and covered with fine soft hairs. Small creamy white flowers occur on the tips of the numerous stems.</p> <p>Parthenium normally germinates in spring and early summer, produces flowers and seed throughout its life and dies around late autumn. However, with suitable conditions (rain, available moisture, mild temperatures), parthenium can grow and produce flowers at any time of the year. In summer, plants can flower and set seed within four weeks of germination, particularly if stressed.</p>





Path: S:\Projects\0011_VCP_Stage2\GIS\ProjectFiles\Projects\Weed_Management_Parh\0011_VS_Weed_MP_Parthenium.aprx

Legend	
● Parthenium (<i>Parthenium hysterophorus</i>)	 5
 Parthenium High Infestation Area	 5/3
 Road	 5/10
 Land Zone 3	 10
 Land Zone 4	 10/5
 Project Area (ML700073)	 9
 Disturbance Footprint	

Vulcan South Parthenium

0 1 2 3

Kilometers

Scale: 1:90,000 (A4)

19/12/2024

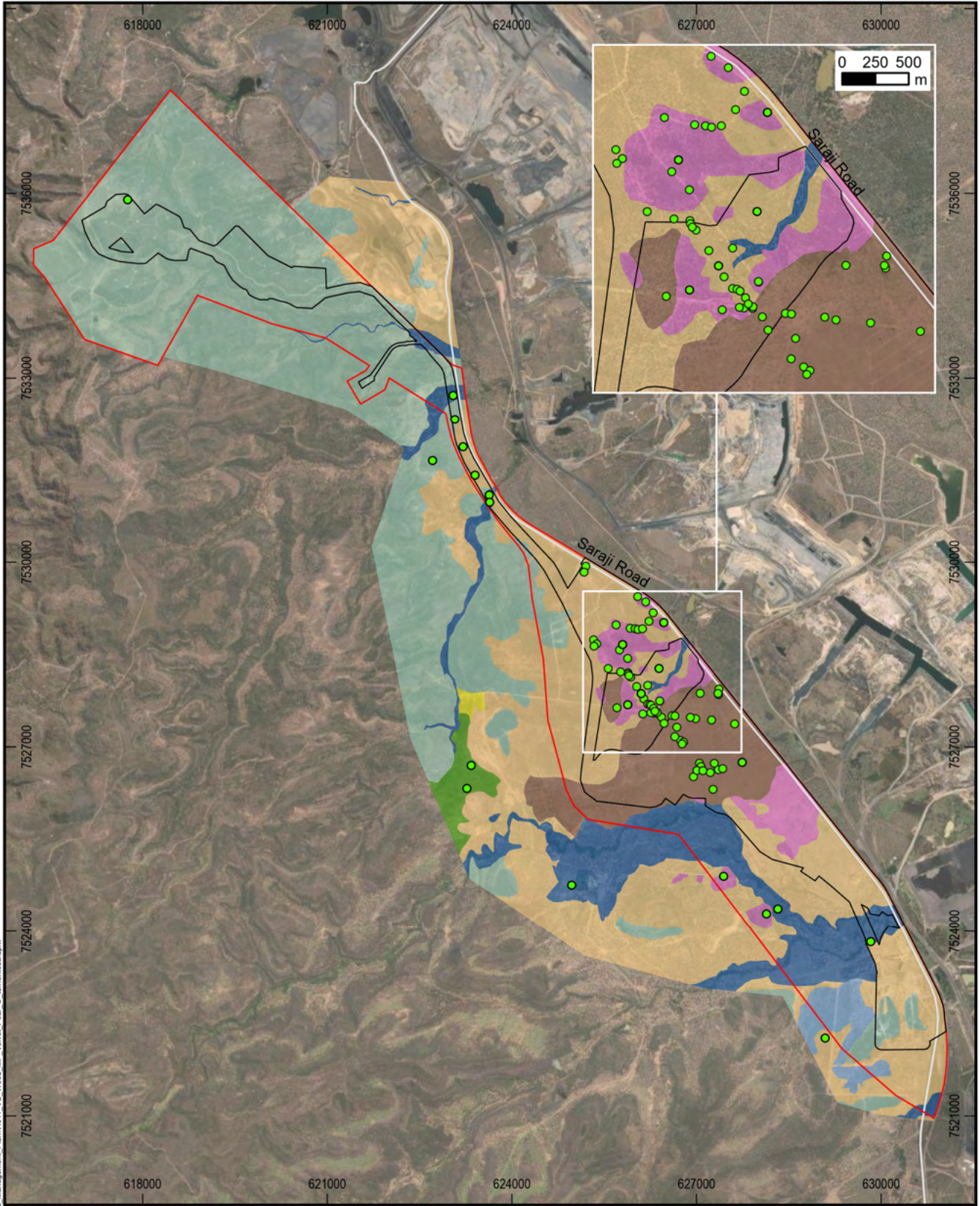
Datum: GDA2020
Projection: MGA55

VITRINITE
BRIGHTER COAL

METSERVE
Mining & Energy Technical Services Pty Ltd

FIGURE 3-1

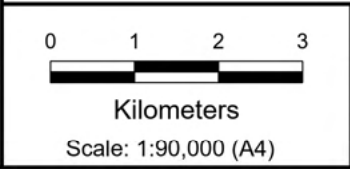
Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024, METServe 2019-2024, Kleinfelder 2024, Earthstar Geographics, Maxar.



Path: S:\Projects\01011_VCP_Stage2\GIS\ProjectFiles\MapManagement_Plan\01011_VS_Weed_MP_Velvet_Pear_O_tomentosa.aprx

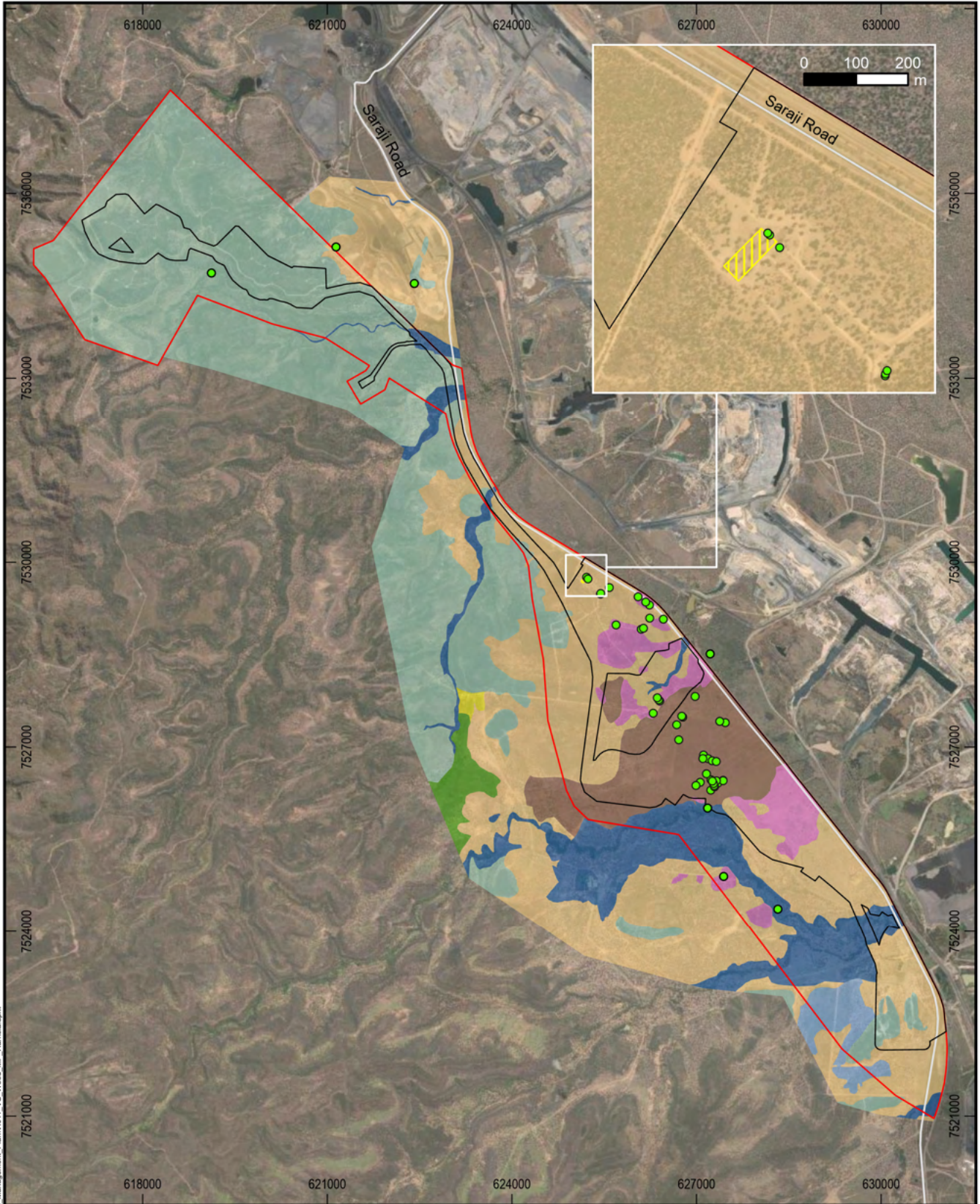
Legend	
●	Velvet Pear (<i>Opuntia tomentosa</i>)
	Road
Land Zone	
	3
	4
	5
	5/3
	5/10
	10
	10/5
	9
	Project Area (ML700073)
	Disturbance Footprint

Vulcan South Opuntia



19/12/2024
 Datum: GDA2020
 Projection: MGA55
FIGURE 3-2

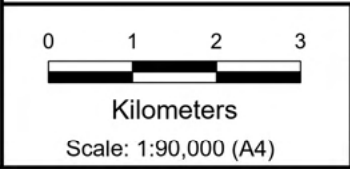
Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024; METServe 2019-2024; Kleinfelder 2024; Earthstar Geographics, Maxar.



Path: S:\Projects\0011_VCP_Stage2\GIS\ProjectFiles\Projects\Weed_Management_Plan\0011_VS_Weed_MP_Harrisia.aprx

Legend	
●	Harrisia Cactus (<i>Harrisia martini</i>)
	Road
	Harrisia Cactus Low Infestation Area
Land Zone	
	3
	4
	5
	5/3
	5/10
	10
	10/5
	9
	Project Area (ML700073)
	Disturbance Footprint

Vulcan South Harrisia



19/12/2024

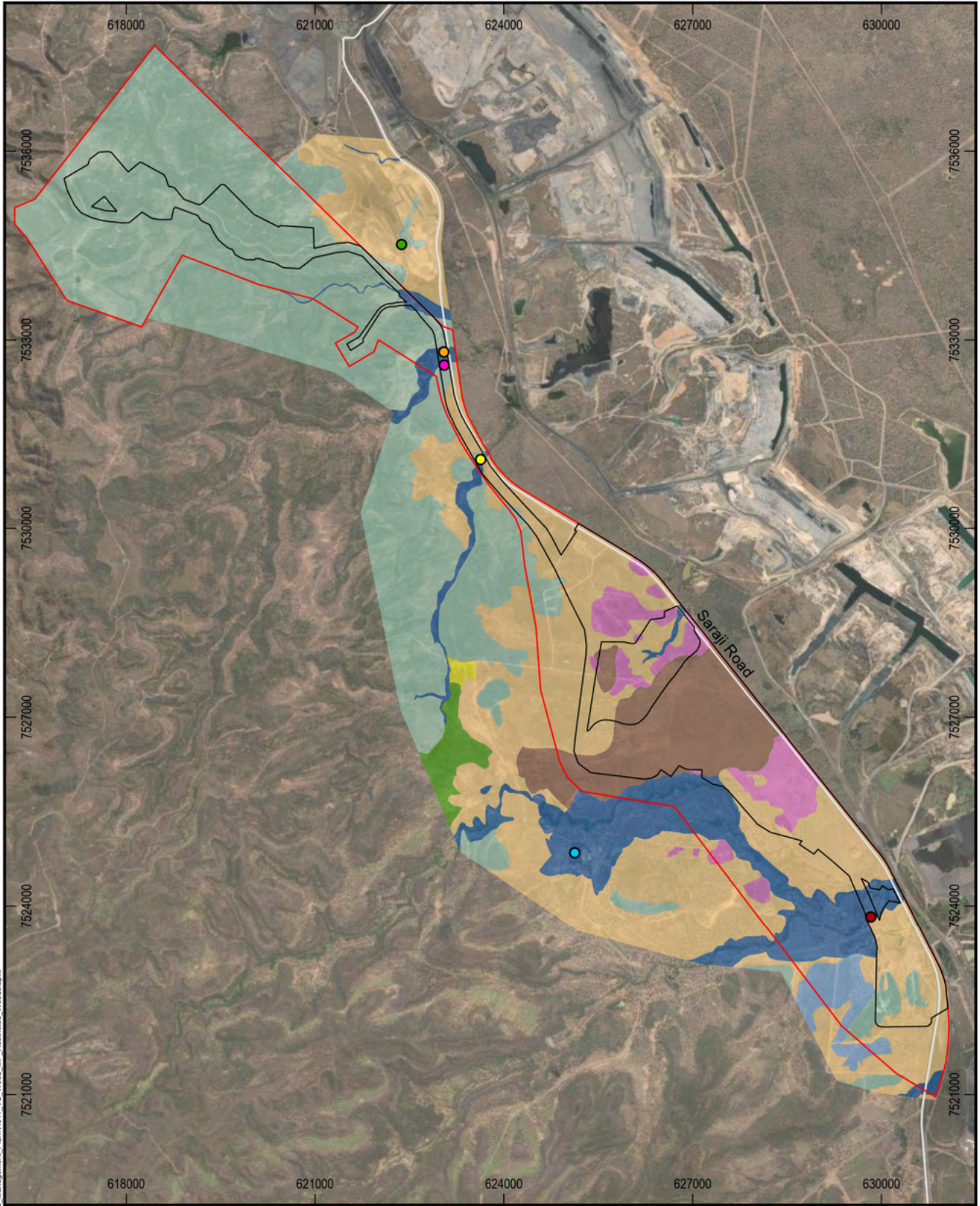
Datum: GDA2020
Projection: MGA55

FIGURE 3-3

VITRINITE
BRIGHTER COAL

METSERVE
Mining & Energy Technical Services Pty Ltd

Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024; METServe 2019-2024; Kleinfelder 2024; Earthstar Geographics, Maxar.



Legend

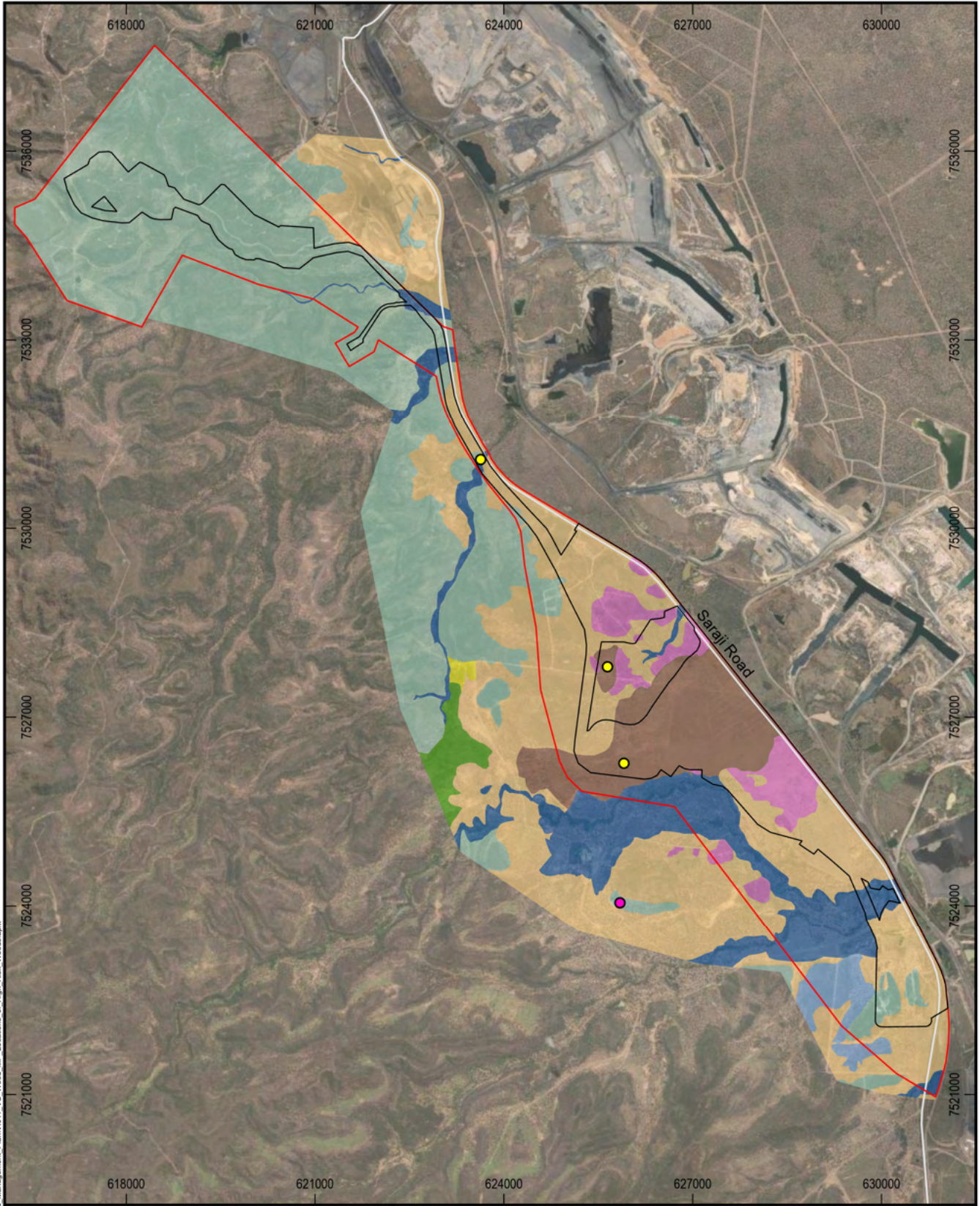
Restricted Weeds	Rubber Vine	Land Zone
● Bellyache Bush (<i>Jatropha gossypifolia</i>)	● Rubber Vine (<i>Cryptostegia grandiflora</i>), ● Prickly Pear (<i>Opuntia stricta</i>)	■ 3
● Olive (<i>Hymenachne amplexicaulis</i>)	● Lantana (<i>Lantana camara</i>)	■ 4
● Prickly Pear (<i>Opuntia stricta</i>)	— Road	■ 5
● Rubber Vine (<i>Cryptostegia grandiflora</i>)	▭ Disturbance Footprint	■ 5/3
	▭ Project Area (ML700073)	■ 5/10
		■ 10
		■ 10/5
		■ 9

Vulcan South
Known Isolated
Locations of Restricted Weeds

 Scale: 1:88,000 (A4)	19/12/2024 Datum: GDA2020 Projection: MGA55	 BRIGHTER COAL Mining & Energy Technical Services Pty Ltd
FIGURE 3-4		

Path: S:\Projects\0011_VCP_Stage2\GIS\ProjectFiles\Map\Management_Plan\0011_VS_Weed_MP_Restricted_Weeds.aprx

Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024; METServe 2019-2024; Kleinfelder 2024; Earthstar Geographics, Maxar.



Path: S:\Projects\01011_VCP_Stage2\ArcGIS\ProjectFiles\Projects\Weed_Management_Plan\01011_VS_Weed_MP_Locations_of_High_Risk_Weeds.aprx

Legend	
● Feral Leucaena (<i>Leucaena leucocephala</i>)	5
● Mimosa Bush (<i>Vachellia farnesiana</i>)	5/3
— Road	5/10
— Land Zone	10
 3	10/5
 4	9
 Project Area (ML700073)	
 Disturbance Footprint	

Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024; METServe 2019-2024; Kleinfelder 2024; Earthstar Geographics, Maxar.

Vulcan South

Locations of High Risk Weeds

(Isaac Biosecurity Plan)

Kilometers

Scale: 1:88,000 (A4)

19/12/2024

Datum: GDA2020
Projection: MGA55

FIGURE 3-5



3.2 Regional Weed Risk

Two of the three non-restricted species listed as priority weeds in the Isaac Region (refer **Table 2-3**) have been identified in surveys to date. These are:




- *Leucaena leucocephala* (Feral Leucaena) – located within the VS mining lease.
- *Vachellia farnesiana* (Mimosa Bush) – located 1.5 km west of the VS mining lease.

Locations where these species have been identified to date are shown on **Figure 3-5**.

A brief summary and image of all non-restricted weeds that are of concern in the Isaac Region is provided in Error! Not a valid bookmark self-reference..

Full descriptions for these weeds can be found on the IRC website at <https://www.isaac.qld.gov.au/Residents/Environment/Biosecurity>

Table 3-2 Description of high-risk invasive plants to the Isaac Region (additional to restricted matters)

Species	Photo	Description
<i>Ricinus communis</i> (Castor Oil Plant)		<p>Castor oil plant is a branching perennial shrub that grows up to 3 m high and occasionally higher. It has stout, hollow branches that are a dull pale green or red. Older branches and trunks turn greyish.</p> <p>Castor oil plant spreads over sandy soil areas, creek banks and gullies. This can lead to a significant loss of prime grazing land.</p> <p>The seeds of castor oil contain ricin, a poison that is extremely toxic to livestock and humans.</p>
<i>Leucaena leucocephala</i> (Feral Leucaena) †		<p>Small tree growing to an average height of 6m. Dull green leaves approximately 25cm long. Cream-yellow spherical flower heads on short stalks. Flattened pods up to 15cm long in dense clusters.</p> <p>Active control is required along road corridors, environmentally sensitive and high asset areas.</p>
<i>Vachellia farnesiana</i> (Mimosa Bush)		<p>Mimosa bush is a rounded shrub or small tree generally growing up to 3 to 5 m high. It often forms thorny thickets and is nearly always multistemmed. Flowers are yellow to orange ball-shaped. Thorns can grow to 10cm long.</p> <p>Mimosa bush does well in dry localities and on loamy or sandy soils along watercourses. If not controlled by grazing, it can develop into infestations that hinder stock movements and mustering.</p>

† Previously identified on Vulcan South





3.3 Environmental weeds

For the purpose of this Weed Management Plan, environmental weeds are exotic species which can adversely harm the environment and should be controlled under the general biosecurity obligation of the *Biosecurity Act 2014*. In the 2019 baseline survey, the most frequently observed weeds were predominantly introduced as pasture species to improve grazing productivity. These were:

- *Bothriochloa pertusa* (Indian Couch);
- *Sida spinosa* (Spiked Sida);
- *Cenchrus ciliaris* (Buffel Grass);
- *Melinis repens* (Natal Grass);
- *Portulaca pilosa* (Hairy Portulaca);
- *Stylosanthes scabra* (Shrubby Stylo); and
- *Urochloa mosambicensis* (Sabi Grass).

While these are productive for active pasture, the proliferation of these species have the potential to reduce native habitat values within the ‘avoidance zone’ shown on **Figure 1-1**, by means such as crowding out native species, or increasing the intensity of wildfires, resulting in increased dieback of native species.

A list of introduced plants observed within the ML or immediate surrounding area are provided in Appendix A.

3.4 Environmental Values Threatened by Weeds

If not managed appropriately, weeds pose a potential risk for rehabilitating the site to post-mining land uses of native ecosystem (non-riparian and riparian) and low-intensity cattle grazing in accordance with the PRC Plan (METServe, 2024c). Weeds of greatest concern are those that are toxic to stock, those that shade or crowd out native species, degrade pastures or increase the intensity of wildfires. Whilst drainage lines in the area are ephemeral, and therefore are of minimal aquatic ecological values, weeds that invade drainage lines or artificial dams have potential to change hydrological characteristics.

It is noted that some introduced pastoral species are considered environmental weeds.

The VS PER assessed the level of risk to matters of environmental significance identified on ML700073 that may be impacted by weeds:

- Ground-feeding Squatter Pigeons avoid areas of dense ground-cover. Non-native plants such as Buffel Grass, Indian Couch, Sabi Grass and Natal Grass are already abundant and widespread on site and have likely already reached the limits of their potential local distribution. Increased localised weed densities are not likely to extend beyond Vulcan South’s disturbance footprint and therefore unlikely to have a significant impact on this species.
- The Koala, listed under both the EPBC Act and the NC Act as an endangered species, is not known to be directly threatened by any weed species, however Koala habitat values have the potential to be reduced by proliferation of weed species.
- Rubber Vine has the potential to choke out and change the characteristics of riparian vegetation, therefore may affect nesting habitats for some species of woodland birds, such as the EPBC listed Rufous Fantail, Satin Flycatcher and Black-faced Monarch (METServe, 2024a) if infestations occur. Rubber vine has the potential to pose a threat to the health and long-term viability of large eucalypts used as denning habitat by Greater Gliders, though the extent is unknown. To date, rubber vine has been recorded at riparian habitat truncated by the haul road at two locations (**Figure 3-4**).
- Threatened Ecological Communities. Patches of remnant brigalow vegetation have potential to be degraded by weeds.

3.5 Inherent risk without controls

Without controls in place, there are inherent risks that activities on ML700073 could introduce or spread restricted or high-risk regional weed species as identified in **Table 3-3** below.



Table 3-3 Inherent risk (without controls) that Vulcan South could spread restricted or high-risk regional weeds

Species	Inherent Risk	Justification
<i>Cryptostegia grandiflora</i> (Rubber Vine)	Moderate	Rubber Vine is confined to creek banks within the project footprint (i.e. Middle and Boomerang Creeks). If not controlled prior to soil disturbance, seed may be spread to new areas (e.g., soil stockpiles, tracks) however non-human factors, such as water flow and wind, are the major vectors for the spread of this species.
<i>Harrisia martinii</i> / spp (Harrisia Cactus)	High	This cactus has been recorded in varying densities within the disturbance footprint. As it can spread via stem fragments, new infestations could establish in soil stockpiles and pose a significant source of large-scale infestations in rehabilitated areas.
<i>Hymenachne amplexicaulis</i> (Olive Hymenachne)	Low	Olive Hymenachne is an aquatic weed recorded 1.7 km west of the project footprint. Suitable habitat (seasonally inundated drainage lines and ponded water, particularly in clay soils) for the species is present within the project footprint. If infestations occur, it could influence surface water management infrastructure. Hymenachne can increase flooding by reducing the flow capacity of the drainage networks. Under flood conditions, plant material builds up at fences and bridges, collecting other floating debris. Hymenachne infestations are a physical barrier for aquatic and semi-aquatic animals, restricting their movements and breeding activities.
<i>Jatropha gossypifolia</i> (Bellyache Bush)	High	A small infestation (<10 plants) of this weed was located 1km east of the project (within the VCM ML) during the baseline survey (METServe, 2020), with a subsequent small outbreak located on a VCM topsoil stockpile in early 2024 (METServe, 2024b). Topsoil stockpiles contaminated with this weed pose a significant source of large-scale infestations in rehabilitated areas. Topsoil movement between the VCM and VS is not proposed and vehicle washdown procedures are in place to minimise potential spread between the MLs due to mining activities, however there is potential for fauna vectors to introduce this species from other locations.
<i>Leucaena leucocephala</i> (Feral Leucaena) †	Moderate	Feral leucaena is known to occur on site as it is introduced as cattle fodder. It has potential to crowd out waterways and may infest surface water management infrastructure if uncontrolled. Densities may increase if stock are excluded from avoidance areas of the ML during operations. Topsoil stockpiles contaminated with this weed pose a significant source of large-scale infestations in rehabilitated areas.
<i>Opuntia stricta</i> (Common Prickly Pear)	Moderate	This cactus was only recorded once within the entire survey area, within the project footprint. If not controlled prior to soil disturbance, fragments may spread to new areas (e.g., soil stockpiles, tracks). As it can spread via stem fragments, there is a risk that new infestations could establish in soil stockpiles.
<i>Opuntia tomentosa</i> (Velvety-tree Pear)	High	This cactus occurs widely, in varying densities, across most of the survey area, including within the disturbance footprint. As it can spread via stem fragments, there is a risk that new infestations could establish in soil stockpiles.
<i>Parthenium hysterophorus</i> (Parthenium)	High	Parthenium is abundant on clay soils and alluvial areas (sites with moisture-retentive soil) within the project footprint. If not controlled prior to soil disturbance, seeds may be spread to new areas (e.g., soil stockpiles, tracks). Non-human vectors such as fauna and birds will spread the sticky seeds, regardless of control methods. Topsoil stockpiles contaminated with this weed pose a significant source of large-scale infestations in rehabilitated areas. Parthenium is toxic to stock and a known irritant and can be hazardous to human health.
<i>Vachellia farnesiana</i> (Mimosa Bush) †	Low	Mimosa Bush was observed only once, 1.5 km west of the Vulcan South mining lease boundary. Given mining activities will not occur in this location, it is unlikely project activities will result in spread of this species. However, this thorny invasive plant has potential to crowd out waterways and contaminate stockpiles if introduced from other areas in the region. With strict washdown procedures in place, the risk should remain low.

† non-restricted invasive plant identified in the Isaac Biosecurity Plan



4 Weed Management Objectives and Principles

The principal objective of this Weed Management Plan is to prescribe management measures and monitoring programs that fulfil the regulatory obligations of Vitrinite Pty Ltd and its workforce pertaining to weeds, as described in **Section 2**. The main goal of the plan is to ensure no increase in the density of restricted weeds listed under the *Biosecurity Act 2014* over time.

4.1 Success Criteria

Success criteria have been broadly aligned with rehabilitation completion criteria pertaining to weeds. The following are the success criteria for weed management at Vulcan South:

- Maintain a percentage cover of *Parthenium* (*Parthenium hysterophorus*) $\leq 0.2\%$;
- Maintain a percentage cover of *Harrisia* Cactus (*Harrisia martinii*) $\leq 0.1\%$;
- Any other restricted weeds known to occur on site are to be maintained at an average density within the ML of < 1 individual per hectare.
- Any weeds that constitute restricted matters under the *Biosecurity Act 2014* that are not known to occur on site are to remain absent from the ML, or (if an infestation begins) are to be eradicated within three years of the initial infestation.
- Weeds do not reduce from the recorded baseline habitat quality values for Koala, Greater Glider and Squatter Pigeon habitat within undisturbed areas of the mining lease.

4.2 Principles of Weed Management

The Queensland Invasive Plants and Animals Strategy 2025-2030 (DAF, 2024) lists:

- Seven guiding principles of effective weed management:
 1. Integration, collaboration and coordination;
 2. Strategic risk-based planning;
 3. Shared responsibility and commitment;
 4. Capability building through education and awareness;
 5. Prevention, preparedness and early intervention;
 6. Best practice and research;
 7. Monitoring and evaluation.
- Six key themes of effective weed management:
 1. Prevention and preparedness;
 2. Effective management approaches;
 3. Strategic planning;
 4. Communication, engagement and training;
 5. Commitment, roles and responsibilities; and
 6. Monitoring and assessment.

The weed management measures proposed by this Weed Management Plan incorporate each of these themes, as discussed in the following sections.



5 Weed Management Measures

The following subsections describe the management measures that are to be undertaken in order to manage weed risks at VS.

5.1 Prevention and Preparedness

Costs of weed management increase exponentially as additional weeds become established and/or spread, therefore, prevention of new infestations is the principle goal of this Weed Management Plan.

Weeds can spread to the site via soil movement, contaminated vehicles/footwear, the movement of livestock, use of supplementary hay during drought, birds and fauna, water runoff from infested areas, and/or wind. While some of these dispersal agents (e.g., birds, fauna, wind and water) cannot be easily managed, the majority of serious weeds in the Isaac region are spread primarily by the movement of soil, vehicles/machinery and livestock, which are risks that can be actively reduced through the implementation of weed hygiene practices. These practices are detailed below.

5.1.1 Vehicle Washdowns

Soil and seeds carried on vehicles and machinery are the predominate sources of new weed infestations in Central Queensland. In addition to being an effective tool for reducing the risk that new weeds are introduced to the disturbance area for VS, condition G9e of the EA requires stringent wash-down and inspection procedures for both machinery involved in clearing/construction activities and those operating outside of designated roads during mine operation, to prevent the spread of weeds.

The Queensland Government describes appropriate methods for washing down vehicles and machinery in their *Vehicle and Machinery Cleandown Procedures* (DAF, 2019b). These procedures, or any subsequent revision, are to be adhered to whenever a vehicle wash-down is required prior to accessing the ML.

The person undertaking the wash-down must adhere to the *Vehicle and Machinery Cleandown Procedures* (DAF, 2019b). The person undertaking the wash-down must also complete a statutory declaration, which includes the date, time, location and procedures followed.

There are no council-operated wash-down facilities in Moranbah or Dysart. The nearest council-operated facilities are located at Clermont and Nebo. However, commercial facilities are available at:

- Caltex Car Wash, 21 Griffin Street, Moranbah (suitable for light vehicles only);
- Hornery, 257 Railway Station Road, Moranbah (suitable for all vehicles, including trucks).

Vehicles may be granted permission to utilise an established wash-down facility associated with Vitrinte's existing operations prior to commencing activities associated with Vulcan South.

All vehicles entering the site for the first time must have undergone a thorough wash-down prior to entry.

Machinery undertaking vegetation clearing or moving of soils within areas known to have restricted or prohibited weeds present are to undergo regular thorough wash-downs during and on completion of works. This is to ensure that stem fragments or weed seeds are not transferred by the machine to a different location on or off-site.

Light vehicles driving through actively seeding weed infested areas should also undergo regular washdowns prior to travelling to other areas or off-site.

Weed hygiene zones

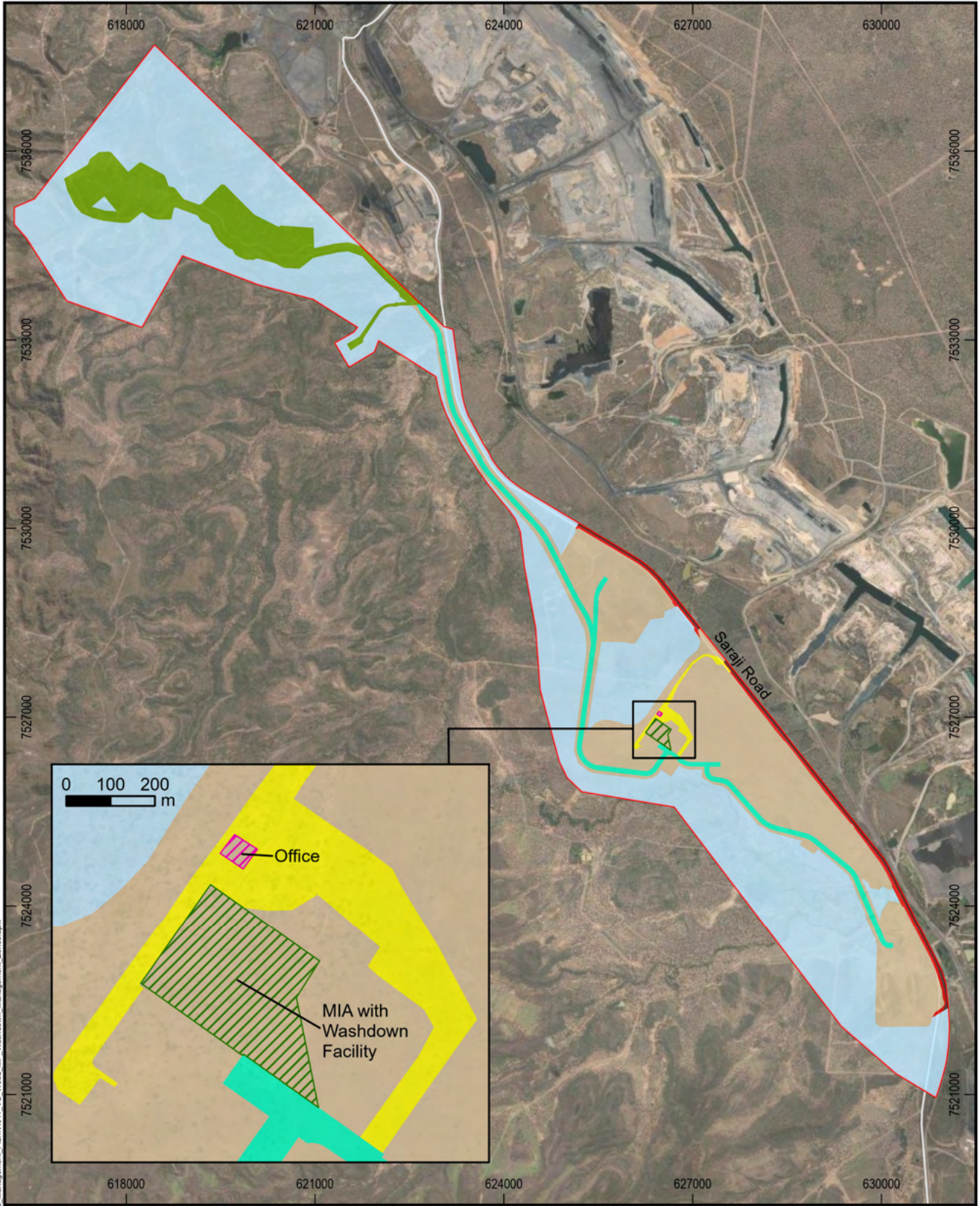
During the initial construction and operational phases of VS, six distinct weed hygiene zones with different wash-down requirements are proposed:

Zone A Saraji Road

There are no specific weed hygiene requirements for accessing Zone A. Numerous members of the public pass through this zone daily as it is a public road.

Zone B Access road

Zone B is the main site access road that will primarily be used by light vehicles driving between the site and nearby towns via the public road network, or heavy machinery entering the site for the first time. This is a low-risk source of weeds to the mining lease given the limited exposure such vehicles tend to have with weed infestations. The zone itself is comprised of hard surfaces unfavourable for weed establishment. No specific weed hygiene protocols will be required prior to



Legend	
	Road
	Project Area (ML700073)
	Office
	MIA with Washdown Facility
Washdown Management Zones	
	Zone A Saraji Road
	Zone B Access Road to Visitors Carpark at MIA
	Zone C Main Haul Road
	Zone D Southern Disturbance Zone
	Zone E Northern Disturbance Zone
	Zone F Avoidance Areas
	N/A

Vulcan South

Washdown Management Zones

Kilometers

Scale: 1:88,000 (A4)

19/12/2024

Datum: GDA2020
Projection: MGA55

VITRINITE
BRIGHTER COAL

METSERVE
Mining & Energy Technical Services Pty Ltd

FIGURE 5-1

Path: S:\Projects\0011_VCP_Stage2\GIS\Projects\Files\Projects\Washdown_Management_Plans\0011_VS_Wred_MP_Washdown_Management_Zones.aprx
 Source: State of Queensland (Department of Resources) 2021; Vitrinite 2019-2024; METserve 2019-2024; Earthstar Geographics.



accessing this zone, unless a vehicle has knowingly entered a weed-infested area during the previous week. In this instance, a wash-down will be required prior to entry.

Zone B may also be used by road trains for hauling coal from site and a third-party washing facility located between Moranbah and Coppabella on the Peak Downs Highway prior to commissioning of the CHPP. This is a low-risk source of weeds to the VS lease given the limited exposure such vehicles tend to have with weed infestations.

Zone C

Zone C will be primarily used by road trains or trucks hauling coal between the highwall or open pit run of mine (ROM) pads and the Coal Handling and Preparation Plant (CHPP). These vehicles have limited exposure to weed seeds given that they remain on formed haul roads. Any vehicles that enter this zone must undergo a weed wash-down if they are new to the site or have left the haulage circuit and public road network for any reason (e.g., for maintenance). The person undertaking the wash-down must adhere to the *Vehicle and Machinery Cleandown Procedures* (DAF, 2019b). The person undertaking the wash-down must also complete a statutory declaration, which includes the date, time, location and procedures followed and provide to the Vitrinite responsible person.

Zone D

Zone D consists of the open cut mining areas within the southern portion of the disturbance footprint (open pits, in-pit / ex-pit dumps, MIA, heavy vehicle parking, workshops, CHPP). All vehicles and machinery entering Zone D are to have a thorough weed wash-down prior to accessing the site for the first time. The person undertaking the wash-down must adhere to the *Vehicle and Machinery Cleandown Procedures* (DAF, 2019b). The person undertaking the wash-down must also complete a statutory declaration, which includes the date, time, location and procedures followed.

For vehicles involved in vegetation clearing and earthworks, vehicles require wash-down at the site wash-down facility in Zone D prior to entering Zones E, C, B or A.

Zone E

Zone E consists of the highwall trial mine area in the northern portion of the disturbance footprint. All vehicles and machinery entering Zone E are to have a thorough weed wash-down prior to access. The person undertaking the wash-down must adhere to the *Vehicle and Machinery Cleandown Procedures* (DAF, 2019b). The person undertaking the wash-down must also complete a statutory declaration, which includes the date, time, location and procedures followed.

For vehicles involved in vegetation clearing and earthworks, vehicles may enter Zone C to undergo washdown at Zone D wash-down facility prior to entering all other Zone D areas or entering Zones C, B or A.

Zone F

Zone F consists of the ‘avoidance area’ of the ML, that is areas outside the authorised disturbance footprint. Vehicles should not enter Zone F unless the driver is approved to do so by the SSE or Environmental Department delegate. Given vehicles will generally be driving off formed tracks when in this zone, washdown should be undertaken at the on-site washdown facility where there is potential the vehicle could transfer weed seeds to a different area. Washdown requirements for vehicles entering and leaving Zone F should be determined according to the tasks undertaken and the level of assessed risk.





5.1.2 Pre-clearing surveys

Prior to an area undergoing vegetation clearing, the area should be surveyed by a person knowledgeable of Queensland weeds to identify the presence of restricted or regional weeds, and determine appropriate control methods to be implemented. Machine-operators are to be able to identify known restricted and regional weeds and segregate high-risk weeds from stockpiled windrows of native vegetation. A key priority is to ensure that cacti plants are correctly handled and not mulched (refer **Section 5.1.4**).

5.1.3 Soil Movement

Areas to be stripped of topsoil for storage and use in rehabilitation should be surveyed pre-clearing and restricted or novel weeds removed using the preferred control method(s) (refer **Section 5.2**) prior to topsoil movement.

In accordance with the PRC Plan, topsoil will be stripped and stockpiled by soil management unit (SMU). Topsoil should be stored as close as practicable to the area it was harvested to minimise the risk of weed seeds or stem fragments being transferred to new areas and impacting rehabilitation success. If topsoil is to be stored for an extended period, a sterile non-permanent cover crop (e.g. millet) should be seeded to minimise the opportunity for weed infestation. To minimise disturbance by cattle or other means, topsoil stockpiles will be fenced.

Any soil, sand, clay, gravel, mulch or other materials imported to the site for use during any phase of VS is to be certified weed-free.

5.1.4 Mulching of cleared vegetation

Cleared native vegetation can be mulched and stored in stockpiles for re-use in erosion sediment control or within rehabilitation areas in accordance with the PRC Plan. Extreme care must be taken NOT to mulch cacti in this process to minimise potential infestation of mulch stockpiles and subsequent spread to new or rehabilitated areas.

5.1.5 Designated cacti or weed disposal trenches

The EA permits the disposal of green waste on site, but does not permit the burning of waste.

The deep burial of *opuntia* or *harrisa spp* plants, including root tubers, within designated disposal trenches or in-pit dumps, is a cost-effective option to minimise the spread of infestations within stockpiles. Trenches should be designed in accordance with *Biodiversity Act 2014* requirements, and may require to be registered as a disposal place. Deep burial is required to ensure that plants do not regrow at the surface and must be regularly monitored in accordance with the *Biodiversity Act 2014* and Biodiversity Regulation 2016.

5.1.6 Livestock Movement

Limited importation of livestock to the mining lease or adjacent area to VS is expected once Vitrinite take control of the ML. If the landowner has negotiated access for a valid reason, then this would be a potential source of weed introduction while the area is the legal responsibility of Vitrinite Pty Ltd. In this case, all stock should be quarantined for eight days in a holding yard before introduction to the property. Alternatively, stock should be acquired from certified weed-free properties.

5.1.7 Establishment of cover crops

A dense sterile (non-permanent) cover crop species (e.g., Silk Sorghum *Sorghum spp.* and/or Japanese Millet *Echinochloa esculenta*) should be sown on disturbed soils (where suitable soils occur) that will remain in-situ for a considerable timeframe during operations but cannot be rehabilitated (e.g. sediment dams, earthen safety bunds) or managed by other means to decrease weed establishment. The shorter survival time of sterile pasture cover species increases the potential for native vegetation to establish.

In accordance with the PRC Plan, for areas undergoing rehabilitation, a non-permanent cover crop species may be incorporated into the native seed mix for the first round of rehabilitation revegetation. Where required, a number of topsoil and subsoil ameliorative measures will be implemented to ameliorate poor soil structure, low moisture retention and low nutrient concentrations that may be encountered. Such amelioration measures may included the application of organic matter, fertiliser, rapid establishing cover crops, and hydro mulching (METServe, 2024b).

The PRC Plan contains the designated seed mix and rehabilitation methodology to be used for each post-mining land use (PMLU) to ensure the success criteria are met. The pastoral species of *Bothriochloa pertusa* (Indian Couch) and *Seca Stylosanthes spp.* are not be included in rehabilitation seed mixes.



5.2 Effective management approaches

5.2.1 Control Priorities

Control priorities consider the following attributes of each weed:

- Current absence (prevention is more cost effective than control);
- Current distribution (small, isolated populations are easiest to control); and
- Threat to achieving the desired post-mining land use (restricted plants and/or those affecting native revegetation or pasture productivity pose the greatest threat).

With the above attributes in mind, the control priorities for weeds occurring or potentially occurring within the ML are:

1. Priority 1 – Restricted or prohibited weed species not currently occurring in the ML but occurring within a 2km buffer (e.g. Bellyache Bush, Olive Hymenachne) or any other species that may be imported from the wider region.
2. Priority 2 - Restricted weeds observed within the disturbance footprint that create a threat to achieving PMLUs if they infest topsoil stockpiles or rehabilitated areas (e.g. Parthenium, Harrisia Cactus, Velvety-tree Pear).
3. Priority 3 - Restricted weed species occurring within the disturbance footprint or avoidance areas in few and small populations (e.g. Common Prickly Pear, Rubber Vine).
4. Priority 4 – Weeds that are not listed under the *Biosecurity Act 2014*, but which could cause the decline of habitat quality of Koala, Greater Glider and Squatter Pigeon habitat within the avoidance areas of the ML.
5. Priority 5 - Weeds that are not listed under the *Biosecurity Act 2014*, but which could outcompete seeded species (native and pastures) in rehabilitated areas.

5.2.2 Integrated Control

Successful weed management generally depends on the utilisation of a suite of integrated control measures, including biocontrol, chemical treatments, mechanical / physical removal, and agricultural practices. The preferred control method(s) depends on the species of weed and the context (size and spread of the infestation, and location of nearby sensitive values). A summary of the different types of control methods are provided below.

Summaries of control methods for known restricted weeds in the vicinity of VS are not specified in this plan; the latest weed fact sheets should be referred to to determine the control method(s) to be used.

The optimal methods for each weed species that is present or may establish within the ML is listed within the Queensland Government's weed fact sheets.

Control methods for the Isaac Region's risk weed species can be located at [Biosecurity - Isaac Regional Council](#).

5.2.3 Physical Control

Physical control methods include hand or machine removal, tilling, burning, deep burial or smothering with mulch or black plastic sheeting. Physical control methods are general labour-intensive, but when correctly implemented are highly effective and allow target treatment of small infestations without damage to surrounding native vegetation.

Physical control methods are generally the most appropriate for the treatment of newly established weeds. Like all control measures, physical methods are best employed before the weed set seeds. If seed production is occurring at the time of control, collection and disposal of fruits/seeds should be undertaken to reduce the long-term weed burden.

Deep burial in an allocated trench or pit is an appropriate control method for cacti species.

For the preferred physical control methods for each weed species, refer to Queensland Government fact sheets available on line.

5.2.4 Chemical Control

A wide range of herbicides are commercially available for the treatment of weeds. Herbicides may be broad-spectrum or selective (targeting certain groups of plants). Herbicides have different modes of action (contact, systemic or residual). Some are hormones or hormone-blockers that disrupt the plant's natural growth patterns. Others act to desiccate the leaves or stems, or to cause the plant to drop its leaves.



In general, the most suitable herbicide for use on weeds depends on the species of weed and whether there are sensitive environmental values (native plant species or waterways) nearby. For the preferred herbicides for each weed species, refer to Queensland Government fact sheets on line.

By law, herbicides must be used in accordance with their label. It is recommended that they are also used only by trained professionals, with appropriate personal protective equipment and knowledge about each chemical's potential for harm.

Chemical control is best undertaken early in the growing season, when the weed is actively growing but not yet flowering or seeding.

5.2.5 Biological Control

Biological control agents (insects and diseases introduced to control weeds) exist for a number of weed species occurring in the Isaac region. The following weed species rarely reach troubling densities in Central Queensland as a result of their biological control agents:

- Velvety-Tree Pear, *Opuntia tomentosa* (eaten by the moth *Cactoblastis cactorum* and cochineal bug, *Dactylopius opuntiae*);
- Common Prickly Pear, *Opuntia stricta* (eaten by the moth *Cactoblastis cactorum* and cochineal bug *Dactylopius opuntiae*); and
- Harrisia Cactus, *Harrisia martinii* (eaten by the beetle *Alcidion cereicola* and mealy bug *Hypogeococcus festerianus*).

Numerous insects and two fungal diseases have also been introduced to control Parthenium (*Parthenium hysterophorus*), but while these reduce the vigour and density of the weed, additional control methods are often required in certain situations. Likewise, the fungal disease *Maravalia cryptostegiae* and moth *Euclasta whalleyi* have been introduced to control Rubber Vine, *Cryptostegia grandiflora*. While these cause temporary defoliation and reduced seed set, adult vines are not killed.

Most biological agents that have been established for weeds are already widespread in Central Queensland and don't require active introduction.

5.2.6 Agricultural

Given the mine is operating within pastoral leases, the introduction or exclusion of cattle may either reduce or increase weed densities.

Several grasses or shrub species deliberately introduced as pastoral fodder within the ML are also classified as environmental weeds. These species are maintained at lower levels when being consumed by cattle. Where cattle are excluded from an area for mining activities, these species may proliferate and require control by other methods.

Conversely, if cattle stocking rates increase within non-disturbance zones of the ML, or are introduced to rehabilitated areas too early, some weeds, such as Parthenium, may proliferate in response to bare ground exposed by overgrazing. The same response may occur in pastures that are grazed too soon following fire. Maintenance of correct stocking rates is important within undisturbed and rehabilitated areas.

5.3 Management Systems & Strategic Responses

The establishment of a new weed infestation triggers a rapid and effective response in order to contain and eradicate the infestation before it reaches a scale that becomes logistically unachievable to control.

Appropriate actions for managing existing and emerging weed risks vary according to its position on the invasion curve shown in **Figure 5-2** below.



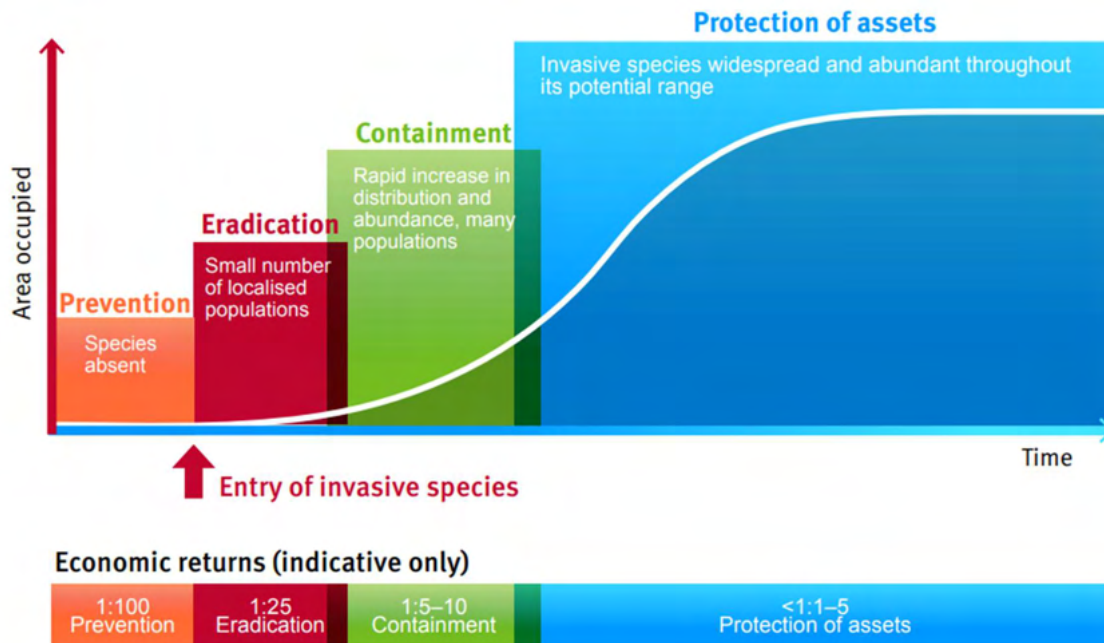


Figure 5-2 Actions appropriate to each stage of the invasion curve (DAF, 2019a)

5.3.1 Pre-existing Weeds

The contamination of topsoil stockpiles by restricted weeds is a principle threat to achieving the success criteria of this Weed Management Plan, due to the far-reaching implications once the topsoil is respread over rehabilitation areas.

Parthenium is abundant on clay soils and alluvial areas (sites with moisture-retentive soil) within the project footprint, but less dominant on less fertile and lower water holding capacity soils. If not controlled prior to soil disturbance, Parthenium seeds may be spread to new areas (e.g., soil stockpiles, tracks). Topsoil stockpiles contaminated with this weed pose a significant source of large-scale infestations in rehabilitated areas.

The cacti species, *Opuntia tomentosa* (Velvety-tree Pear) and *Harrisia martinii* (Harrisia Cactus) are widespread and may have reached the full potential extent of occurrence. Their densities are probably maintained by poor soil fertility and low water-holding capacity, as well as a variety of biological control agents introduced to suppress populations. If this is the case, these weed species are unlikely to jeopardise VS's ability to achieve its objective of no net increase in weed density and control efforts may not be warranted in areas not impacted by operational activities. Should annual or milestone monitoring indicate these weeds continue to increase in density over time, control measures will be triggered to contain and reduce the existing infestations.

Other weeds occur in isolated populations that probably represent an early phase of establishment. The following measures are to be taken to limit the proliferation of weeds already present on site during VS activities:

- Weed spread should attempt to be minimised by implementing control measures within the proposed works areas prior to construction;
- Avoid driving off-road in areas known to contain declared plants (e.g. parthenium weed) or in other areas that present a risk of vehicle or machinery contamination;
- Do not drive through infested paddocks;
- Ensure clothing and footwear is free of soil and plant material before stepping into vehicles;
- Avoid driving or working in contaminated areas in wet or dewy conditions;
- Wherever practicable, construction activities should work from areas with fewer weed species and smaller infestations towards areas where there is a greater abundance of weeds;
- Where possible, work infested areas separately and clean down equipment thoroughly before moving to another area;



- Wherever practicable, avoid slashing and clearing of vegetation and other work in infested areas during peak seed production times;
- Keep roads, tracks and buffer zones free of invasive plants;
- Control of weeds germinating on topsoil stockpiles should be prioritised, as weed contamination of this resource will have far-reaching implications once the topsoil is respread over rehabilitation areas.

5.3.2 New Infestations

The introduction and proliferation of novel weeds into the ML is a principle threat to achieving the success criteria of this Weed Management Plan. While prevention of introduction is the primary means of avoiding new infestations, successful removal of new infestations that do arise is fundamental and is contingent on the following:

- Awareness of potential prohibited weeds that may appear in Queensland.
- Awareness of all invasive plants within the *Isaac Biosecurity Plan*.
- Timely detection through regular inspections of high-risk sites and annual monitoring.
- Activation of the Trigger Action Response Plan (TARP).

5.3.3 Trigger Action Response Plan

The identification of a new restricted or prohibited invasive plant species weeds on the ML, or new infestations that require eradication, will trigger the following process:

1. The area containing the plant or infestation is to be isolated using hazard tape. No entry by unauthorised people or vehicles is permitted;
2. Identification of the weed is to be confirmed by using the Weed Spotter App (a Department of Agriculture and Fisheries tool), sending a photograph of the plant to a qualified ecologist or contacting . If identification cannot be confirmed via a photograph, a specimen should be collected, dried and submitted to the Queensland Herbarium;
3. If the weed is identified as a category 2 restricted matter or prohibited plant under the *Biosecurity Act 2014*, it is to be reported to Biosecurity Queensland within 24 hours;
4. Following confirmation of the weed's identity, an appropriate control method should be identified by consulting Queensland Government fact sheets, weed control practitioners, and/or the local Department of Primary Industries (formerly Department of Agriculture and Fisheries) service centre;
5. Control methods must be implemented within 2 weeks of detection and prior to the weed producing its first crop of seed;
6. The isolated area is to remain isolated until no new individuals have been detected following three consecutive heavy rain events.

5.4 Communication, engagement and training

Effective management of weeds relies on broad stakeholder knowledge of the problem and the management issues. All staff and contractors arriving on site for the first time are to undergo a site induction that includes:

- An explanation of the risks posed by weeds;
- A description of everyone's obligations, including the GBO,
- Targetted information regarding higher-risk activities, such as vegetation clearing, earthworks and off-road driving;
- Instructions about the different zones of the ML, and washdown procedures required for each;
- Health risks associated with weeds on site;
- Internal reporting requirements regarding weeds and the TARP.

In addition to education through inductions, posters depicting the key weeds likely to be found are to be placed in offices, crib huts (where toolbox meetings take place) and other locations as determined by site management.



Information regarding new weed infestations or other weed management topics will be included on a regular basis during tool box meetings to ensure ongoing high-levels of awareness on site.

Operators that are undertaking activities with the potential to spread or introduce weeds should receive internal training by appropriately qualified and experienced site personnel or undertake external or on-line training. Training should cover known and potential restricted and prohibited invasive species that are a threat to Queensland.

Accredited training is available for personnel undertaking vehicle washdowns (DAF, 2019b).

5.5 Roles & Responsibilities

The roles and responsibilities of personnel are listed in **Table 5-1**.

Table 5-1 Roles and responsibilities

Responsible person	Management Measure	Timing
Senior Site Executive	Oversee implementation and revision of the Weed Management Plan and TARP	Throughout the construction, operational and rehabilitation phases
	Prepare and give inductions to new staff and contractors	Throughout the construction, operational and rehabilitation phases
	Inspect, or delegate a person to inspect, statutory declarations of weed wash-downs and approve entry to Zones C-F of any new vehicles.	Throughout the construction, operational and rehabilitation phases
	Organise and manage preclearing, baseline, high-risk, annual and milestone monitoring surveys	At start of the construction phase, then every year (during the wet season).
	Oversee the environmental components of the Permit to Disturb process, including pre-clearing surveys.	Pre and post all land-clearing activities
	Oversee that any materials brought to site are sourced from a weed-free supplier	Throughout the construction, operations and rehabilitation phases
Senior Environmental Advisor or Environmental Advisor	Undertake regular inspections of high-risk sites	30 days after every heavy rain event
	Undertake checks for restricted weeds during pre-clearing surveys	Pre all land-clearing activities
	Production and installation of weed posters in the tool box room and other frequently visited office locations	Throughout the construction, operational and rehabilitation phases
	Implement physical control methods of new weed infestations, as advised by the SSE	As advised by the SSE, following the detection of new weed infestations
	Implementing the TARP as advised by the SSE	Whenever inspections identify new weed infestations
	Requesting identification of new weeds	Whenever inspections reveal new weed infestations
	Report any category 2 restricted matter or prohibited matter to Biosecurity Queensland (or designated authority).	Within 24 hours of being discovered.
Liaising with Qld Govt, IRC and/or weed control professionals about appropriate control methods for new infestations	Whenever inspections reveal new weed infestation	
Contractor – ecologist/botanist/weed specialist	Undertake baseline, annual and milestone monitoring surveys and reporting	Annual weed monitoring and milestone surveys of rehabilitation until certification.
Contractor – weed control specialist	Undertake chemical control of weeds, or other specialised weed control tasks.	As advised by the SSE or delegate.



Responsible person	Management Measure	Timing
All staff and contractors	Vehicle wash-downs	In accordance with this Plan throughout the construction, operational and rehabilitation phases.
	Report any suspected new weed sightings or infestations to the SSE	Throughout the construction, operational and rehabilitation phases
	Undertake all tasks with consideration of their GBO regarding weeds.	Throughout the construction, operational and rehabilitation phases

5.6 Monitoring and assessments

Effective weed management is contingent on the early identification and rapid eradication of new species or infestations. Weed seeds can remain dormant in the soil for more than ten years (varies between species), and allowing new weed infestations to flower and seed can therefore result in significant long-term control costs.

The monitoring program is designed to efficiently detect new weed infestations, as well as provide data that can be used to assess the success of the Weed Management Plan against the success criteria.

5.6.1 Existing data

Weed data across the ML was collected during the terrestrial ecological assessment in 2019, subsequent pre-exploration drilling activities on EPC1233 commencing in 2020, and Biocondition surveys in 2023. The presence and densities of key weeds were mapped and correlated by statistical analysis of regional ecosystems (REs) and land zone types.

A weed baseline survey was undertaken in March 2024 prior to the start of the Vulcan North Bulk Sample Pit (VNBSP), located in the North Pit disturbance area. This survey took place in the wet season, when annual weeds are most detectable. The presence of restricted weeds were mapped based on subjective density classes (none, low density, medium density, high density etc) and are included in the VNBSP Weed Management Plan.

This data was used to inform the weed management strategy to date, and the success criteria documented in **Section 4.1**.

Given the time lapsed since the terrestrial ecology assessment in 2019, and the definition of the disturbance footprint for mining activities, an additional baseline survey will be conducted in 2025 by appropriately qualified ecologists, to document the current weed status of the ML.

5.6.2 Baseline Survey

An updated baseline survey is to be undertaken for the ML early within the construction phase. The survey is to occur before the end of the wet season, when annual weeds are most detectable.

The survey is to be designed and undertaken by qualified ecologists/botanists with experience identifying weed and non-native plant species in Queensland.

The purpose of this survey is to confirm the distribution of all restricted weeds and introduced plant species inhabiting the mining lease. The mining lease will be divided into different zones with potentially differing weed densities, based on previous flora surveys on the site. These zones will generally be separated by vegetation class (these generally reflect soil and other environmental attributes that correlate with susceptibility to weed invasion) but also include other zones such as the verges of Saraji Road, existing disturbed areas and mining infrastructure. Each zone will be sampled using transects at a sampling density consistent with **Table 5-2**.





Table 5-2 Weed sampling intensity

Zone Size	Number of transects
1-10 ha	At least two
10-30 ha	Four
30-60 ha	Six
60-100 ha	Eight
100-250 ha	Ten
250-500 ha	Twelve
More than 500 ha	Fifteen

Percentage groundcover of each weed species is to be estimated in each 10 m × 50 m belt transect. Cover is to be estimated to the nearest 0.1%, with 0.1% cover being equivalent to 0.5 m² total cover within the transect. For weeds distributed in small clumps, the percentage cover will be assigned by estimating the total area covered by the weed and converting this to a percentage. For more widespread weeds, the belt transect will be divided into eight 5 m x 12.5 m sub-quadrats, percentage cover estimated for each sub-quadrat and then the average calculated across the entire belt transect.

An overall density of each weed within the ML is to be calculated by:

1. Calculating an average percentage groundcover per region by calculating the mean across all the transects measured within the relevant region; then
2. Deriving a final weed density estimate for the mining lease by calculated the weighted mean percentage cover across all regions, weighting by the area in hectares of each region.

These overall weed density estimates will be used as baseline estimates to determine changes in weed densities over time, and are the principal means of assessing success criteria.

5.6.3 Milestone Monitoring

In order to track the success of the Weed Management Plan, the monitoring survey described for the baseline survey (see Section 5.6.2) is to be repeated every two years throughout the life of VS (including construction, operational and rehabilitation phases). Surveys are to be undertaken in the late wet season (February to May), to enable identification of annual weeds.

Once progressive rehabilitation commences, the units of assessment within rehabilitated sites are to be the rehabilitation areas/domains (as defined within the approved PRC Schedule), rather than weed-density zones. The remainder of the ML will continue to be sampled by weed-density zones.

Milestone monitoring will identify any changes to weed populations over time, to determine whether overall densities remain at “levels that are similar to those on site prior to mining or representative of adjacent areas”.

A final round of milestone monitoring is to be undertaken once rehabilitation is complete, in order to demonstrate the achievement of the PRC Schedule final rehabilitation milestones.

5.6.4 Inspections of High-risk Sites

In addition to the mining lease-wide milestone monitoring that is undertaken every two years, regular inspections of high-risk sites are to be undertaken by mine environmental staff one month after each heavy rainfall event (defined as >20 mm in a 24-h period). The purpose of these inspections is to identify any new weed infestations soon after establishment, so that they can be controlled before they have an opportunity to seed/spread.

Rainfall data is available from Vitrinite’s on-site weather station(s), allowing accurate rainfall records to be accessed.

In the event that new weeds are identified during visual inspections of high-risk areas, these should be photographed, location entered into a GPS tracking system, and the management response described in Section 5.3.3 followed.

The following are considered high-risk sites that are to be inspected one month after each heavy rainfall event:

1. Vicinity of wash-down facilities;



2. Edges of light vehicle car park;
3. Topsoil stockpiles;
4. Mulch stockpiles
5. Deep burial restricted weed disposal trenches;
6. Edges of haul roads, MIA, ROM, on-site carparks and laydown areas;
7. Sediment basins and disturbed riparian sites.

These inspections are to take place throughout the construction, operational and first year of rehabilitation. The requirement for high-risk site monitoring will be reassessed for the later rehabilitation phase, given reduced levels of on-site activity.

An annual survey of all high-risk sites is to be undertaken by mine environmental staff at the end of the wet season (May-June) to identify any locations requiring weed control.

Monitoring should include:

- tracking by GPS to document the high-risk areas surveyed
- points entered at locations where restricted plants were sighted, documenting the species and level of infestation.

Should mine environmental staff not have capacity to undertake the annual high-risk area survey, a consultant should be contracted to undertake the survey, document the findings, and provide control requirements or other recommendations.

The two-yearly milestone weed monitoring lease-wide survey undertaken by an external consultant will include all high-risk sites.

5.6.5 Wash-down Audits

Any new vehicles entering Zone B from off site, or entering Zone B after having left a designated haul road or public road will require authorisation from Vitrinite's SSE or a person designated by the SSE. Prior to authorising the entry of vehicles, the SSE or designated person must inspect and approve a weed hygiene declaration (including a completed washdown checklist) completed by the driver.

In accordance with EA Condition G9(e) and (f), any on-site vehicles or machinery undertaking on-site activities that have the potential to spread weeds should undergo regular washdown at the on-site wash down facilities and on task completion.

Vehicles that have travelled through actively seeding restricted plant matter, hence have elevated potential to transfer restricted weeds (notably Parthenium) offsite, must wash-down the vehicle at the on-site washdown facility before leaving the mining lease.



6 Reporting

The following are the reporting requirements of this Weed Management Plan:

1. Baseline and two-yearly milestone monitoring survey reports: To be prepared by the specialist contractors undertaking the monitoring. These reports should include one map per restricted weed species showing the boundaries of the weed density zones (or rehabilitation areas/domains, for rehabilitated sites). These reports should also present the results from each sampling transect, along with an overall weed density score for each weed species. These reports should also compare how the weed density scores have changed over time to assess whether the success criteria are being achieved. Copies of these reports are to be kept on file by the SSE, and will inform EPBC2023/annual return reports to the Australian Government.
2. Records of inspections for each weed inspection of high-risk sites: An excel file (or other suitable record system) is to be maintained that records the date, time since heavy rain, name of the inspector, sites inspected, locations of any weed sightings.
3. Records of weed control undertaken: An excel file (or other suitable record system) is to be maintained that records the date, time, location, weed species targeted, name of the person/company undertaking weed control, control method used, and results of follow-up inspections to assess level of success of the method used.
4. A GIS database containing weed locations and treatments should be maintained by Vitrinite's environment department or specialist contractor to assist with reporting requirements.
5. Copies of weed declaration forms: Scanned copies of weed declaration forms completed for all vehicles arriving to the site (entering Zones C/D/E/F) are to be kept on file, alongside other vehicle onboarding documents.
6. Records of internal vehicle washdowns are to be maintained at the on-site washdown facility, and filed on an annual basis.



7 Management Plan Revision

The following circumstances will trigger a revision of this Weed Management Plan:

- Subsequent baseline surveys identifying additional weed species or mapped locations resulting in a recommendation to update the plan by an appropriately qualified person (AQP);
- Amendment to the Environmental Authority or EPBC approval;
- Annual or two-yearly milestone monitoring reveals a failure to achieve any of the success criteria listed in **Section 4.1**;
- There are revisions to the species listed under the *Biosecurity Act 2014*;
- There are revisions to the species listed as Weeds of National Significance;
- The Isaac Regional Council releases an update to their *Isaac Region Biosecurity Plan 2024-2027*.

The Senior Site Executive (SSE) is responsible for instigating and managing the revision.

Notification and publishing of the revised Plan is to occur as per State and Federal approval conditions.



8 References

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METServe (2024b). *Vulcan South Progressive Rehabilitation and Closure Plan and Schedule*. Report prepared for Vitrinite by METServe Pty Ltd, 2024.

METServe (2024c). *Vulcan Coal Mine Weed Survey 2024*. Report prepared for Vitrinite by METServe Pty Ltd, 2024.

METServe (2024d). *Weed Management Plan for Vulcan South Bulk Sample Pit*. Report prepared for Vitrinite by METServe Pty Ltd, 2024.



Appendix A Environmental Weeds observed in Study Area

Family	Scientific Name	Common Name	Land Zone observed*					
			3	4	5	9	10	NR
Aizoaceae	<i>Trianthema portulacastrum</i>	Black Pigweed						
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena Weed	Y		Y		Y	Y
Amaranthaceae	<i>Alternanthera pungens</i>	Khaki Weed						
Apocynaceae	<i>Cryptostegia grandiflora</i>	Rubber Vine	Y					
Asteraceae	<i>Ageratum conyzoides</i>	Billygoat Weed	Y					
Asteraceae	<i>Acanthospermum hispidum</i>	Bristly Star Bur	Y	Y	Y			
Asteraceae	<i>Sonchus oleraceus</i>	Common Sow thistle						
Asteraceae	<i>Verbesina encelioides</i>	Crownbeard	Y					
Asteraceae	<i>Emilia sonchifolia</i>	Emilia	Y		Y		Y	
Asteraceae	<i>Bidens bipinnata</i>	Ferny Cobbler's Pegs						
Asteraceae	<i>Verbesina encelioides</i>	Golden Crown bear	Y					
Asteraceae	<i>Sonchus oleraceus</i>	Milk Thistle						
Asteraceae	<i>Xanthium occidentale</i>	Noogoora Burr	Y					
Asteraceae	<i>Parthenium hysterophorus</i>	Parthenium	Y	Y	Y	Y		Y
Asteraceae	<i>Acanthospermum hispidum</i>	Star Burr	Y		Y			Y
Asteraceae	<i>Emilia sonchifolia</i>	Tasselflower	Y		Y			
Asteraceae	<i>Tridax procumbens</i>	Tridax Daisy	Y					
Cactaceae	<i>Harrisia martinii</i>	Harrisia Cactus	Y	Y	Y		Y	
Cactaceae	<i>Opuntia stricta</i>	Prickly Pear	Y					
Cactaceae	<i>Opuntia tomentosa</i>	Velvet-tree Pear	Y	Y	Y	Y	Y	
Caesalpiniaceae	<i>Senna occidentalis</i>	Coffee Senna	Y					
Caesalpiniaceae	<i>Chamaecrista rotundifolia</i>	Round-leaf Sensitive Pea					Y	
Convolvulaceae	<i>Ipomoea lonchophylla</i>	Cow Vine						
Convolvulaceae	<i>Polymeria sp.</i>	Polymeria				Y		Y
Cucurbitaceae	<i>Cucumis anguria</i>	West Indian Gherkin						
Cyperaceae	<i>Cyperus rotundus</i>	Purple Nutsedge				Y		
Euphorbiaceae	<i>Euphorbia hirta</i>	Asthma Weed	Y					
Fabaceae	<i>Crotalaria juncea</i>	Brown Hemp			Y			Y
Fabaceae	<i>Stylosanthes hamata</i>	Caribbean Stylo	Y		Y	Y	Y	
Fabaceae	<i>Stylosanthes scabra</i>	Shrubby Stylo	Y	Y	Y	Y	Y	
Fabaceae	<i>Macroptilium atropurpureum</i>	Sirat	Y	Y				
Fabaceae	<i>Crotalaria pallida</i>	Smooth Rattlepod	Y					
Fabaceae	<i>Stylosanthes humilis</i>	Townsville Stylo	Y		Y			
Fabaceae	<i>Chamaecrista rotundifolia</i>	Wynn Cassia						
Jungernanniaceae	<i>Bidens bipinnata</i>	Bipinnate Cobbler's Pegs	Y				Y	



Family	Scientific Name	Common Name	Land Zone observed*					
			3	4	5	9	10	NR
Jungernanniaceae	<i>Bidens pilosa</i>	Cobbler's Pegs	Y		Y		Y	
Malvaceae	<i>Sida rhombifolia</i>	Arrowleaf Sida	Y			Y	Y	
Malvaceae	<i>Abutilon guineense</i>	Chinese Lantern	Y					
Malvaceae	<i>Sida cordifolia</i>	Flannel Weed	Y	Y	Y	Y	Y	
Malvaceae	<i>Sida rhombifolia</i>	Paddy Lucerne	Y					
Malvaceae	<i>Malvastrum coromandelianum</i>	Prickly Malvastrum	Y					
Malvaceae	<i>Malvastrum americanum</i>	Spiked Malvastrum	Y	Y	Y	Y	Y	
Malvaceae	<i>Sida spinosa</i>	Spiny Sida	Y	Y	Y	Y	Y	
Mimisaceae	<i>Leucaena leucocephala</i>	Leucaena	Y			Y		
Passifloraceae	<i>Passiflora foetida</i>	Stinking Passionflower	Y					
Phyllanthaceae	<i>Phyllanthus virgatus</i>	Creeping Phyllanthus	Y		Y		Y	
Plantaginaceae	<i>Scoparia dulcis</i>	Licorice Weed	Y		Y		Y	
Poaceae	<i>Echinochloa colona</i>	Awnless Barnyard Grass	Y	Y				
Poaceae	<i>Cenchrus ciliaris</i>	Buffel Grass	Y	Y	Y	Y	Y	
Poaceae	<i>Eleusine indica</i>	Crowsfoot Grass						
Poaceae	<i>Chloris virgata</i>	Feathertop Rhodes Grass	Y	Y	Y		Y	
Poaceae	<i>Cynodon dactylon</i>	Green Couch	Y		Y			
Poaceae	<i>Megathyrsus maximus var. pubiglumis</i>	Green Panic	Y		Y		Y	
Poaceae	<i>Bothriochloa pertusa</i>	Indian Couch	Y	Y	Y	Y	Y	
Poaceae	<i>Urochloa panicoides</i>	Liverseed Grass						
Poaceae	<i>Hymenachne amplexicaulis</i>	Olive Hymenachne	Y					
Poaceae	<i>Chloris barbata</i>	Purpletop Rhodes Grass						Y
Poaceae	<i>Melinis repens</i>	Red Natal Grass	Y		Y	Y	Y	
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass						
Poaceae	<i>Eragrostis cilianensis</i>	Stink grass						
Poaceae	<i>Digitaria ciliaris</i>	Summer Grass						Y
Poaceae	<i>Hyparrhenia rufa</i>	Thatch Grass						
Portulacaceae	<i>Portulaca oleracea</i>	Common Purslane						
Portulacaceae	<i>Portulaca pilosa</i>	Hairy Portulaca						
Rubiaceae	<i>Richardia brasiliensis</i>	White eye	Y		Y		Y	
Solanaceae	<i>Datura leichhardtii</i>	Thornapple	Y			Y		
Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Snake weed	Y					