6.0 Field Survey Results

6.1 Flora Survey Results

6.1.1 Vegetation communities

The Project area is predominantly cleared for grazing, with non-remnant area comprising approximately 70 % of the total Project area. Ground-truthed vegetation within the Project area largely comprises of mixed open woodlands dominated by narrow-leaved ironbark (*Eucalyptus crebra*) and red bloodwood (*Corymbia erythrophloia*) associated with RE 11.11.15 (33.3%), narrow-leaved ironbark and red bloodwood associated with RE 11.12.1 (20%), and silver-leaved ironbark (*E. melanophloia*) and narrow-leaved ironbark associated with RE 11.8.4 (17.3%), primarily on metamorphosed hills and ridges. Creeks and other alluvial areas typically consist of forest red gum (*E. tereticornis*) and river she-oak (*Casuarina cunninghamiana*) associated with RE 11.3.25.

Surveys confirmed 35 REs within the Project footprint, of which 10 are listed as Of Concern and 2 listed as Endangered under the VM Act, see **Figure 6-1**. A summary for each RE is provided below in **Table 6.1.**

Table 6.1 Ground-truthed REs within the Project footprint and Project area

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
11.3.4 *Eucalyptus tereticornis* woodland to open forest. Other tree species that may be present include *E. camaldulensis, Corymbia tessellaris, C. clarksoniana, E. melanophloia, E. platyphylla* or *Angophora floribunda. E. crebra* and *Lophostemon suaveolens* may be locally common. A shrub layer is usually absent, and a grassy ground layer is prominent, and may include any of *Bothriochloa bladhii* subsp. *bladhii, Aristida* spp., *Heteropogon contortus, Dichanthium* spp. and *Themeda triandra*. Occurs on Cainozoic alluvial plains and terraces. Occurs on variety of soils, including deep cracking clays, medium to fine textured soils, and deep texture-contrast soils.	0.17	42.74	0.40
11.3.25 *Eucalyptus tereticornis* or *E. camaldulensis* woodland to open forest. Other tree species, including *Casuarina cunninghamiana, E. coolabah, Melaleuca bracteata, Melaleuca viminalis, Livistona* spp. (in north), *Melaleuca* spp. and *Angophora floribunda*, may occur. An tall shrub layer may occur, including *Acacia salicina, A. stenophylla* and *Lysiphyllum carronii*. Low shrubs are present, but rarely form a conspicuous layer. The ground layer is open to sparse and dominated by perennial grasses, sedges or forbs. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. Soils are very deep, alluvial, grey and brown cracking clays with or without some texture contrast. These are usually moderately deep to deep, soft or firm, acid, neutral or alkaline brown sands, loams or black cracking or non-cracking clays, and may be sodic at depth (Burgess 2003).	3.43	195.76	1.75

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
11.3.25d *Melaleuca bracteata* woodland to open forest. Occurs on fringing alluvial soils or near-channel levees on heavy wet clays.	2.85	14.55	19.59
11.3.26 *Eucalyptus moluccana* or *E. woollsiana* +/- *E. populnea* +/- *E. melanophloia* open forest to woodland +/- *Allocasuarina luehmannii* low tree layer and a grassy ground layer. In northern subregions, there may be shrub layer of any of *Eremophila mitchellii, Flindersia dissosperma, Citrus glauca* or *Petalostigma pubescens*, with a sparse grassy ground layer. Occurs on margins of Cainozoic alluvial plains on deep texture contrast soils.	0.67	27.81	2.41
11.5.9d *Corymbia citriodora* and/or *E. crebra* woodland. The mid layer ranges from absent to a sparse to dense shrubland typically dominated by *Acacia* spp. (such as *A. excelsa, A. leiocalyx*), *Petalostigma pubescens, Lysicarpus angustifolius, Alphitonia excelsa* and occasionally *Melaleuca nervosa*. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges. Soils are generally deep red earths.	-	14.13	-
11.8.3 Semi-evergreen vine thicket which may have emergent *Acacia harpophylla, Casuarina cristata* and *Eucalyptus* spp. Occurs on Cainozoic igneous rocks. Generally restricted to steeper, rocky hillsides.	-	140.24	-
11.8.4 *Eucalyptus melanophloia* and/or *E. crebra* +/- *E. orgadophila* +/- *Corymbia erythrophloia* woodland to open woodland. *Macrozamia moorei* is a conspicuous element of the mid layer in the Central Highlands. Localised patches of *Corymbia citriodora* occur on volcanic plugs such as Minerva Hills. Generally occurs on slopes of mountains and hills formed from Cainozoic igneous rocks usually with shallow stony soils and extensive outcropping.	103.96	1,026.95	10.12
11.10.1 *Corymbia citriodora* predominates and forms a distinct but discontinuous woodland to open forest. On rocky slopes, *Eucalyptus crebra* and *C. hendersonii* may be scattered throughout the canopy or locally abundant. On flats and footslopes, scattered E. *crebra, C. clarksoniana* and *C. tessellaris* may occur. *Corymbia trachyphloia* and *E. cloeziana* often occur on crests and plateaus while *E. apothalassica* and *E. longirostrata* sometimes occur in moister microhabitats. Scattered tall to low shrubs, such as *Acacia leiocalyx, Acacia* spp., *Bursaria spinosa* subsp. *spinosa*, *Persoonia falcata, Alphitonia excelsa, Petalostigma pubescens* and *Xanthorrhoea johnsonii* are usually present and sometimes form a conspicuous layer. The ground layer varies from sparse to moderately dense (depending on the rockiness) and is dominated by perennial grasses. Occurs on hills and ranges, particularly on colluvial lower slopes, formed from medium to coarse-grained sediments (usually sandstone). Associated soils are often	-	56.41	-

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
texture contrast with a thin sandy or loamy surface horizon and some uniform sandy and lithosol soils.			
11.10.4 *Eucalyptus decorticans* predominates forming a distinct but discontinuous canopy (25-30m high). *Eucalyptus decorticans* usually forms pure stands, however other *Eucalyptus* spp. often form part of the canopy and may dominate. Other tree species that may be present and/or dominant include *Acacia shirleyi, Angophora leiocarpa, Callitris glaucophylla, Eucalyptus apothalassica, Lysicarpus angustifolius, E. exserta, E. fibrosa* subsp. *nubilis, E. panda, E. tenuipes, Corymbia trachyphloia*, and *E. virens*. On very rocky shallow soils, *Eucalyptus bakeri, E. curtisii* or *E. viridis* may occur. *Acacia shirleyi* is the most frequent tall shrub, although other Acacia spp. May be locally dominant. There is usually a low tree or tall shrub layer dominated by species such as *Acacia sparsiflora, A. burrowii, Callitris endlicheri, Allocasuarina inophloia, Acacia* spp., *Eucalyptus tenuipes, Alphitonia excelsa* and *Petalostigma pubescens*. A low shrub layer is not usually present, however where it occurs *Acacia* spp. And *Dodonaea triangularis* usually predominate. The ground layer is sparse to open, and dominated by perennial grasses, usually *Aristida* spp. or *Arundinella nepalensis*. Occurs on crests, scarps and upper slopes of ranges formed from medium to coarse-grained sediments with shallow soils.	0.01	43.28	0.02
11.10.7 *Eucalyptus crebra* and/or *E. melanophloia +/- E. populnea* shrubby woodland. *Eucalyptus melanophloia* and/or *E. crebra* predominate and form a distinct but open canopy. *E. populnea* is commonly present and may be locally dominant particularly on lower slopes. A low tree to tall shrub layer usually dominated by a range of species including *Eremophila mitchellii, Acacia decora, A. longispicata* spp. *longispicata* and *A. excelsa* is present. A low shrub layer with *Petalostigma pubescens* and other species is formed in places. The ground layer is variable in cover and composition, but composed mainly of grasses. Occurs on the lower slopes of scarp retreats, associated with dissected tablelands. Associated soils are generally moderately deep, acidic, sandy, yellow earths and sandy-surfaced texture contrast soils formed from medium to coarse-grained sediments.	-	18.80	-
11.10.8 Semi-evergreen vine thicket and microphyll rainforest. Occurs on medium to coarse-grained sediments that may be subject to local enrichment from adjacent rocks such as basalt as well as seepage.	-	4.70	-
11.10.13 Open forest (to woodland) with a range of canopy species including *Eucalyptus cloeziana, E. melanoleuca, E. sphaerocarpa, Corymbia bunites, C. hendersonii, C. trachyphloia, E. suffulgens, C.*	-	17.03	-

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
leichhardtii, C. citriodora, E. baileyana. Occurs on sandstone scarps and tablelands with shallow soils formed from medium to coarse-grained sediments.			
11.11.5 Microphyll rainforest (with or without *Araucaria cunninghamii* emergents) and semi-evergreen vine thicket. Floristics and structure varies with site. There is usually a continuous tree canopy (9 - 15m high) with a wide range of species including *Flindersia australis, Backhousia kingii, Excoecaria dallachyana, Melia azedarach, Ficus* spp., *Strychnos psilosperma, Macropteranthes leichhardtii* and *Alstonia constricta*. An emergent tree layer (12- 20m high) commonly occurs with species including *Brachychiton australis, B. rupestris, Flindersia australis, Ficus* spp. *Araucaria cunninghamii* and sometimes *Eucalyptus* spp. There is a shrub layer (1-3m high) with density depending on canopy cover and frequent species including *Croton* spp., *Abutilon* spp., *Capparis* spp., *Acalypha eremorum* and *Codonocarpus attenuatus*. Ferns, mosses and vines are common. Occurs on hilly terrain with slopes ranging from 55 and up to 80% locally. Formed from moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. Associated soils are generally shallow loams and clays with minor areas of deeper cover.	-	9.21	-
11.11.10 *Eucalyptus melanophloia +/- E. crebra +/- Corymbia dallachiana +/- C. erythrophloia* grassy or occasionally shrubby woodland or low woodland. Occurs on moderately to strongly deformed and metamorphosed sediments and Permian sediments.	-	4.70	-
11.11.15 *Eucalyptus crebra +/- Corymbia erythrophloia +/- E. populnea +/- E. melanophloia +/- C. tessellaris +/- C. clarksoniana* woodland to open woodland often with a shrubby layer. *Eucalyptus exserta* and *E. platyphylla* present in central coastal part of bioregion. Occurs on undulating rises and low hills, often with distinct strike pattern formed on moderately to strongly deformed and metamorphosed sediments and interbedded volcanics and Permian sediments.	66.49	1,976.57	3.36
11.11.18 Semi-evergreen vine thicket. Occurs on undulating plains, rises and gentle slopes of ranges formed on moderately to strongly deformed and metamorphosed sediments and interbedded volcanics.	-	60.14	
11.12.1 *Eucalyptus crebra +/- Corymbia erythrophloia* woodland to open woodland. *E. melanophloia* is rarely present and may be locally dominant. Also includes localised areas may be dominated by *E. persistens*. Occurs on ranges on igneous rocks.	80.61	1,212.22	6.65
11.12.2 *Eucalyptus melanophloia* and *Corymbia erythrophloia +/- E. populnea* grassy woodland. *Eucalyptus moluccana* sometimes present	-	3.94	-

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
on colluvial lower slopes. Occurs on undulating rises and low hills formed from Mesozoic to Proterozoic igneous rocks.			
11.12.4 *Araucaria cunninghamii* is a common emergent from the general canopy layer. Canopy species include *Falcataria toona*, *Ficus virens, Canarium australianum, Alstonia scholaris, Planchonella pohlmaniana, Cleistanthus dallachyanus* and *Backhousia citriodora*. Common shrub or understorey species are *Mackinlaya macrosciadea, Baloghia inophylla, Polyalthia nitidissima, Bosistoa medicinalis* and *Aglaia sapindina*. The sparse ground layer includes species such as *Scleria sphacelata* and *Adiantum hispidulum*. Vines and epiphytes are common and include *Microsorum punctatum, Cissus oblonga, Smilax australis* and *Pisonia aculeata*. *Eucalyptus moluccana* often associated with lower slopes on sandy sites. Occurs on low hills, ranges and boulder strewn slopes formed from Mesozoic to Proterozoic igneous rocks including granite.	1.95	22.93	8.50
11.12.6 *Corymbia citriodora, Eucalyptus crebra, E. microcarpa/E. moluccana, Angophora leiocarpa* and *E. melanophloia* open forest to woodland. Other tree species that may be present include *E. tereticornis +/- C. tessellaris +/- C. clarksoniana* and *E. fibrosa*. Can include areas of *E. suffulgens* in the east of the bioregion. There is generally a sparse to moderately dense mid layer dominated by species such as *Alphitonia excelsa, Petalostigma pubescens, Acacia* spp. and occasionally *Callitris glaucophylla* or *E. exserta*. Occurs on gently undulating lower slopes of hills formed from Mesozoic to Proterozoic igneous rocks (granite). Associated soils are often deep texture contrast with thin sandy or loamy surface horizon over acid mottled subsoils to shallow sandy or loamy skeletal soils. May include areas that occur on deeply weathered granite (land zone 5 or 7).	-	15.72	-
12.3.3 *Eucalyptus tereticornis* woodland. *Eucalyptus crebra* and *E. moluccana* are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include *Angophora subvelutina* or *A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens* and *E. melanophloia*. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000 mm per year.	-	<0.001	-
12.3.7 Narrow fringing woodland of *Eucalyptus tereticornis, Casuarina cunninghamiana* subsp. *cunninghamiana +/- Melaleuca viminalis*. Other species associated with this RE include *Melaleuca bracteata, M. trichostachya, M. linariifolia*. *Lomandra hystrix* often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region.	-	<0.001	-

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
12.5.1a *Eucalyptus decorticans* open forest +/- *Corymbia citriodora* subsp. *variegata*, *C. trachyphloia* and *Acacia blakei*. Occurs on remnant Tertiary surfaces often around margins of plateaus.	-	7.34	-
12.9-10.21 *Eucalyptus acmenoides* or *E. portuensis* woodland usually with *Corymbia trachyphloia* subsp. *trachyphloia* +/- *Angophora leiocarpa, E. major, E. moluccana, E. exserta, Lophostemon confertus* (whipstick form). Occurs on Cainozoic and Mesozoic sediments.	-	1.00	-
12.9-10.23 *Eucalyptus melanoleuca* open forest +/- *E. major, Corymbia trachyphloia, E. acmenoides, C. citriodora* subsp. *variegata*. Occurs on Cainozoic and Mesozoic sediments and adjacent Mesozoic to Proterozoic igneous rocks.	-	56.22	-
12.9-10.24 *Eucalyptus suffulgens* open forest to woodland +/- *E. acmenoides* tall woodland. Occurs on Cainozoic and Mesozoic sediments and adjacent Mesozoic to Proterozoic igneous rocks.	0.03	305.42	<0.01
12.11.4 Low microphyll vine forest and semi-evergreen vine thicket. Characteristic species include *Backhousia kingii, Pleiogynium timorense, Aidia racemosa, Archidendropsis thozetiana, Atalaya rigida, Barklya syringifolia, Bridelia leichhardtii, Elaeodendron melanocarpum, Backhousia subargentea, Flueggea leucopyrus, Homalium alnifolium* and *Terminalia porphyrocarpa*. *Melaleuca bracteata* is often present along watercourses. Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics.	-	2.22	-
12.11.7 *Eucalyptus crebra* woodland. Other species such as *Corymbia clarksoniana* may be present in low densities or in patches. Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics.	-	0	-
12.12.4 *Eucalyptus acmenoides* +/- *Syncarpia glomulifera* subsp. *glomulifera* woodland. Other species may be present including *Corymbia intermedia, C. trachyphloia, E. major, E. resinifera, Lophostemon confertus* (whipstick form). Grades into *Eucalyptus montivaga* forest at higher altitude. Occurs at high altitude on ranges, on Mesozoic to Proterozoic igneous rocks, especially granite.	-	1.00	-
12.12.7 *Eucalyptus crebra* grassy woodland. Other species such as *Corymbia erythrophloia, Eucalyptus exserta, E. tereticornis, C. tessellaris, C. citriodora* subsp. *variegata* may be present in low densities or in patches. Mid-layer generally sparse but can include low trees such as *Vachellia bidwillii, Alphitonia excelsa, Allocasuarina luehmannii* and *Petalostigma pubescens*. Small areas of *Callitris glaucophylla* occur in	-	202.22	-

Regional Ecosystem	Clearing Area within Project footprint (ha)	Area within Project area (ha)	Clearing area as % of Project area
central western parts of bioregion. Occurs on Mesozoic to Proterozoic igneous rocks.			
12.12.11 *Eucalyptus portuensis* or *E. acmenoides, Corymbia trachyphloia* subsp. *trachyphloia* woodland +/- *E. crebra*, *C. intermedia, E. exserta* and *Angophora leiocarpa*. Whipstick *Lophostemon confertus* often present in understorey and in gullies. Occurs on hillsides on Mesozoic to Proterozoic igneous rocks.	-	5.45	-
12.12.13 Microphyll and microphyll/notophyll vine forest +/- *Araucaria cunninghamii*. Characteristic species include *Dendrocnide photiniphylla, Diospyros geminata, Drypetes deplanchei, Ficus virens, Cryptocarya bidwillii, Planchonella myrsinifolia, Vitex lignum-vitae, Hernandia bivalvis, Croton acronychioides, Flindersia* spp., *Olea paniculata, Excoecaria dallachyana, Gossia bidwillii* and on northern half of bioregion *Vitex acuminata, Archidendropsis thozetiana, Pleiogynium timorense* and *Cupaniopsis simulata*. Occurs on Mesozoic to Proterozoic igneous rocks.	-	1.20	-
12.12.18 Low microphyll vine forest +/- *Araucaria cunninghamii* and semi-evergreen vine thicket. Characteristic species include *Brachychiton australis, B. rupestris, Archidendropsis thozetiana, Flindersia australis, F. collina, Psydrax odorata* forma *buxifolia*, *Alectryon diversifolius, Acacia fasciculifera, Turraea pubescens, Arytera microphylla, Atalaya salicifolia, Elattostachys xylocarpa, Grevillea helmsiae* and *Coatesia paniculata*. *Melaleuca bracteata* is often present along watercourses. Occurs on Mesozoic to Proterozoic igneous rocks.	-	408.93	-
12.12.27 *Corymbia trachyphloia, Eucalyptus crebra +/- Callitris endlicheri* woodland. Occurs in mountains comprised of Mesozoic to Proterozoic igneous rocks.	0.86	30.86	2.79
Total remnant	261.03	5,929.70	4.40
Non-remnant	992.97	13,485.8	7.42
Total	1,254	19,387.70	6.47

6.1.2 Threatened Ecological Communities

RE 11.8.3 and 11.11.18 are considered to form part of the SEVT of the Brigalow Belt (North and South) and Nandewar Bioregions TEC, which is listed as Endangered under the EPBC Act. Currently there is no specific diagnostic criteria or condition thresholds for this TEC, however under the Queensland mapping protocols, constituent REs that are of remnant status and are greater than 5 ha in a non-coastal subregion is a mappable entity for this TEC.

Based on these protocols, three patches of SEVT TEC were confirmed present in the northern portion of the Project area, as shown in **Figure 6-1**. One patch consisted of emergent Bottle trees (*Brachychiton* spp.), Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*) and occasional Silver-leaved ironbark (*Eucalyptus melanophloia*) associated with RE 11.11.18 whilst the other two patches consisted of occasional Bottle trees, Rock fig (*Ficus rubiginosa* f. *rubiginosa*), Broad-leaved wilga (*Geijera salicifolia* var. *latifolia*), Narrow-leaved Backhousia (*Backhousia angustifolia*) and occasional Silver-leaved ironbark associated with RE 11.8.3.

The condition of all patches observed was highly variable and likely a function of historic land use, cattle utilization and fire regimes.

Plate 6.1 SEVT TEC: RE 11.8.3 with emergent *Brachychiton rupestris* (left); RE 11.11.18 (right)

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Kariboe Wind Farm

Ground-Truthed Regional Ecosystems

Figure 6.1 Sheet 1 of 5

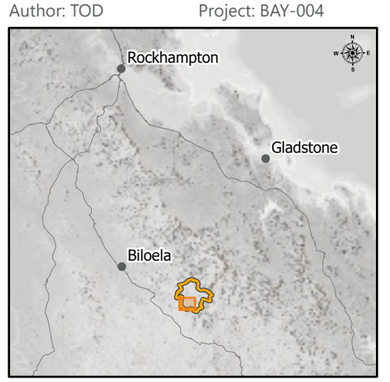
- Project Boundary
- Turbine
- Access Road
- Facilities
- Temporary Facilities
- Substation
- Disturbance Footprint
- Watercourse

Ground-truthed Regional Ecosystems (Attexo 2022)

- Remnant vegetation containing endangered regional ecosystem
- Remnant vegetation containing of concern regional ecosystem
- Remnant vegetation containing least concern regional ecosystem
- High value regrowth containing of concern regional ecosystem
- High value regrowth containing least concern regional ecosystem
- Non-remnant

Date: 5/12/2022 Reviewed: CC

Author: TOD Project: BAY-004



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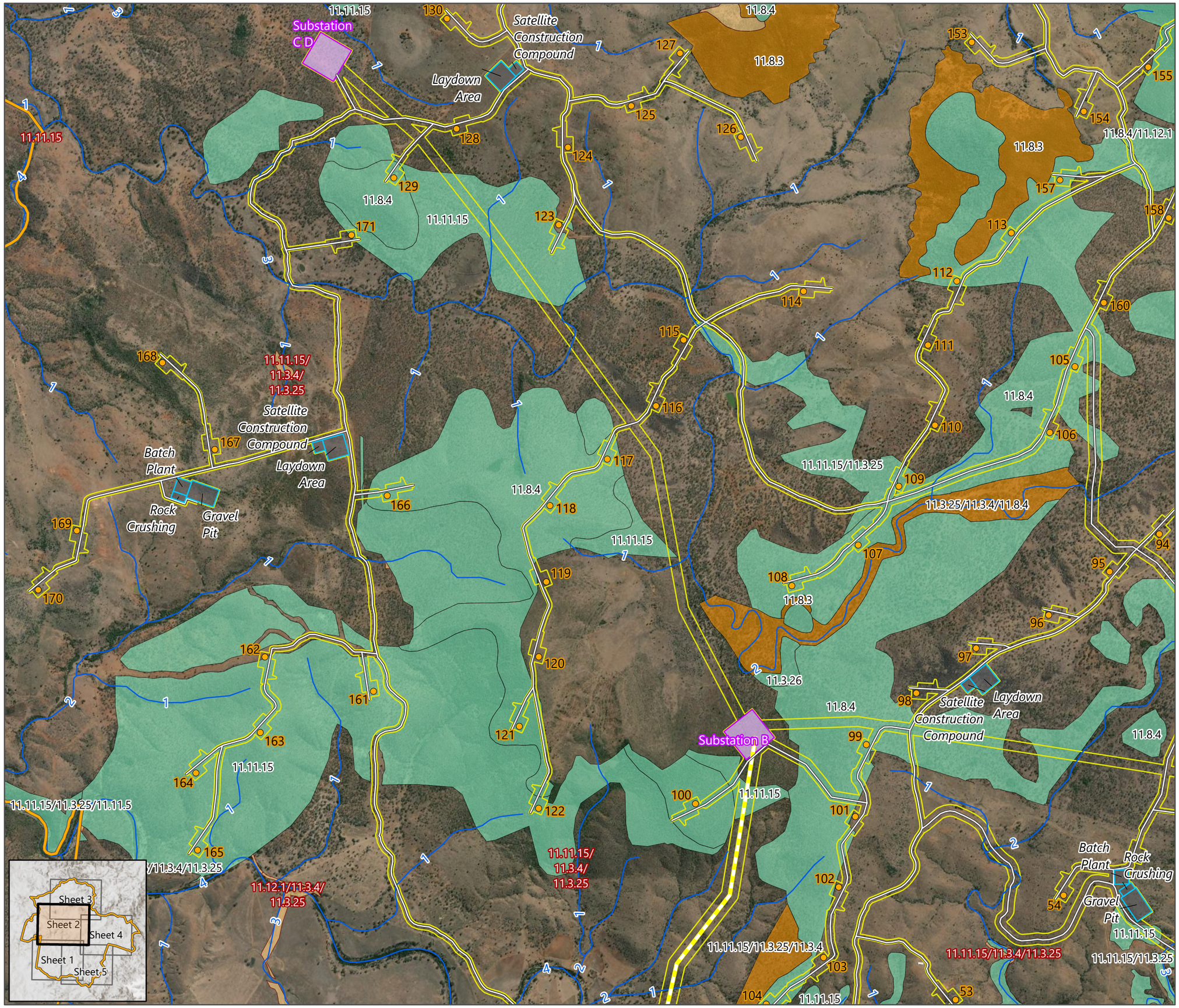

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Kariboe Wind Farm

Ground-Truthed Regional Ecosystems

Figure 6.1 Sheet 2 of 5

- Project Boundary
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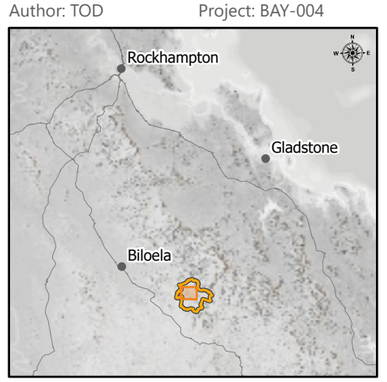
Ground-truthed Regional Ecosystems (Attexo 2022)

- Remnant vegetation containing endangered regional ecosystem
- Remnant vegetation containing of concern regional ecosystem
- Remnant vegetation containing least concern regional ecosystem
- High value regrowth containing of concern regional ecosystem
- High value regrowth containing least concern regional ecosystem
- Non-remnant

Date: 5/12/2022 Reviewed: CC
Author: TOD Project: BAY-004



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Kariboe Wind Farm

Ground-Truthed Regional Ecosystems

Figure 6.1 Sheet 3 of 5

- Project Boundary
- Turbine
- Access Road
- Facilities
- Temporary Facilities
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Ground-truthed Regional Ecosystems (Attexo 2022)

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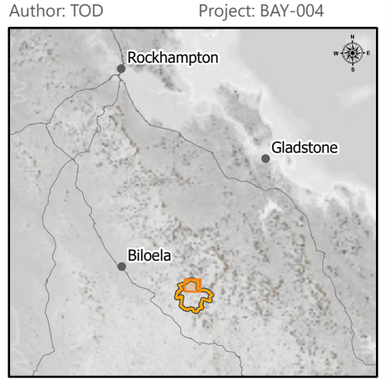
- Remnant vegetation containing of concern regional ecosystem
- Remnant vegetation containing least concern regional ecosystem
- High value regrowth containing of concern regional ecosystem
- High value regrowth containing least concern regional ecosystem
- Non-remnant

Date: 5/12/2022 Reviewed: CC

Author: TOD Project: BAY-004



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Data Source(s):
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vegetation Management Regional Ecosystems - Department of Environment and Science (2022)
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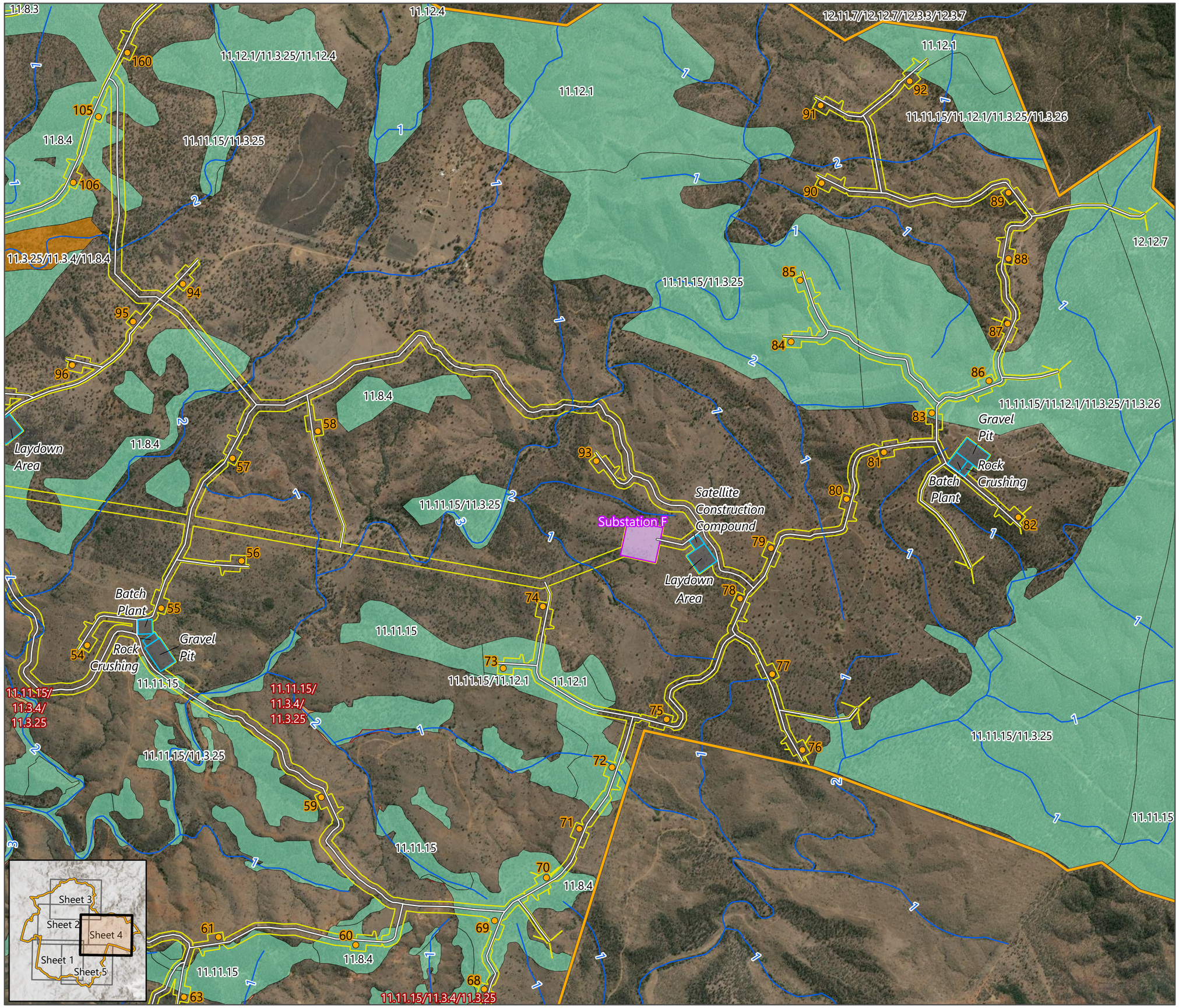

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Kariboe Wind Farm

Ground-Truthed Regional Ecosystems

Figure 6.1 Sheet 4 of 5

- Project Boundary
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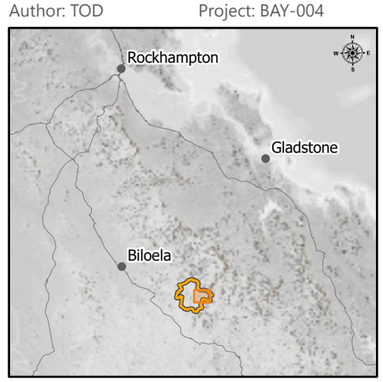
Ground-truthed Regional Ecosystems (Attexo 2022)

- Remnant vegetation containing endangered regional ecosystem
- Remnant vegetation containing of concern regional ecosystem
- Remnant vegetation containing least concern regional ecosystem
- High value regrowth containing of concern regional ecosystem
- High value regrowth containing least concern regional ecosystem
- Non-remnant

Date: 5/12/2022 Reviewed: CC
Author: TOD Project: BAY-004



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Data Source(s):
Digital Cadastral Database - Department of Resources (2022)
vegetation Management Regional Ecosystems - Department of Environment and Science (2022)
Earthstar Geographics, © State of Queensland (Department of Resources) 2022, Esri, USGS

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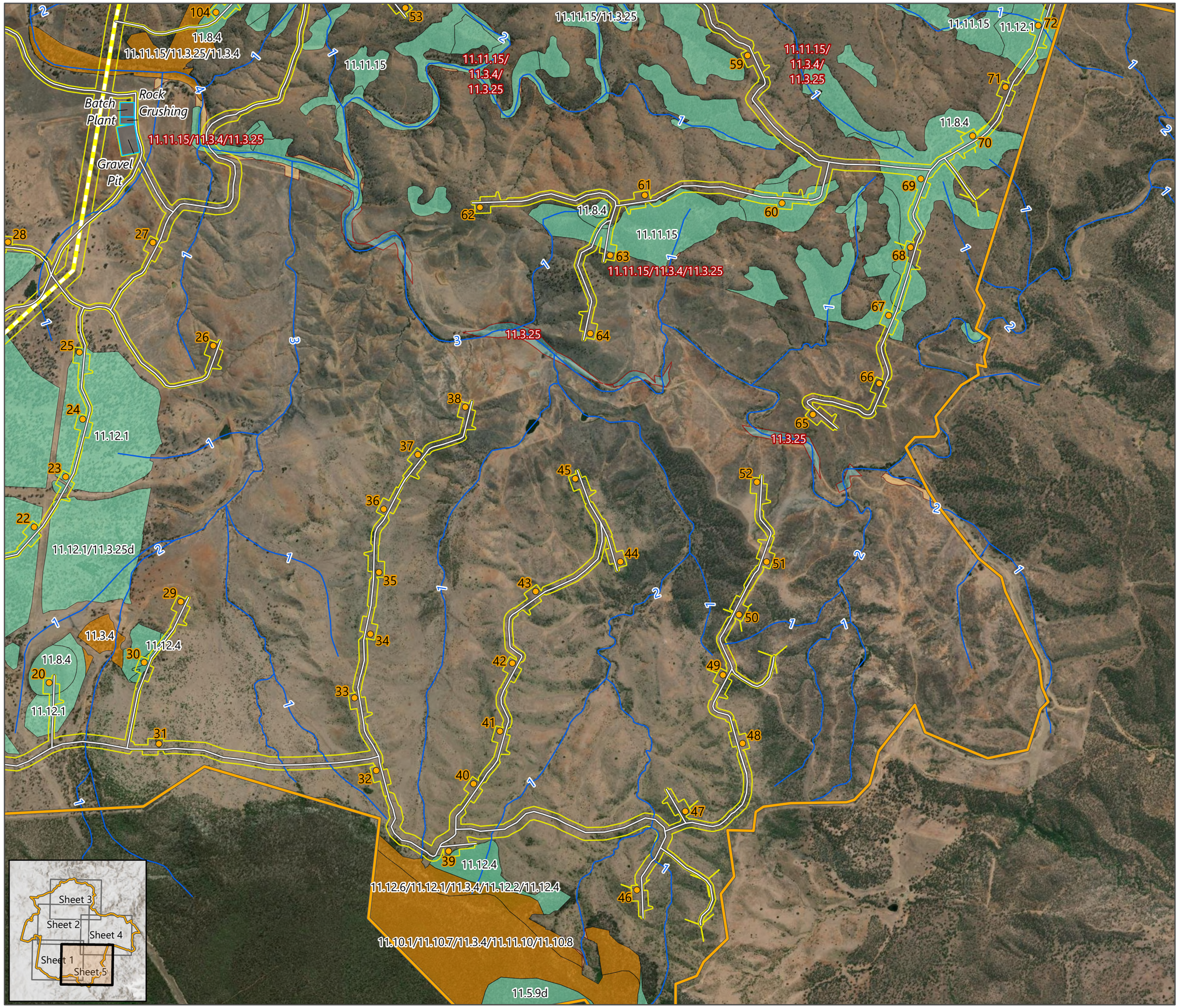

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Kariboe Wind Farm

Ground-Truthed Regional Ecosystems

Figure 6.1 Sheet 5 of 5

- Project Boundary
- Turbine
- Access Road
- Facilities
- Temporary Facilities
- Substation
- Disturbance Footprint
- Watercourse

Ground-truthed Regional Ecosystems (Attexo 2022)

- Remnant vegetation containing endangered regional ecosystem
- Remnant vegetation containing of concern regional ecosystem
- Remnant vegetation containing least concern regional ecosystem
- High value regrowth containing of concern regional ecosystem
- High value regrowth containing least concern regional ecosystem
- Non-remnant

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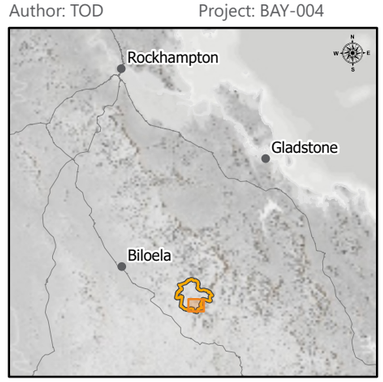

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Data Source(s):
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vegetation Management Regional Ecosystems - Department of Environment and Science (2022)
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6.1.3 Flora Species

A population of 121 specimens of Large-fruited Cycad (*Cycas megacarpa*) was recorded from one location in the north of the Project area as shown in **Figure 6-2**. *C. megacarpa* is listed as Endangered under the EPBC Act and NC Act. The population was observed in an area approximately 1.5 ha in size within *Eucalyptus crebra* woodland on soils derived from strongly metamorphosed arenite-rudite rocks. Individuals ranged in size between 0.3 – 2.5 m tall and were found in poor condition as the area was in close proximity to a watering point for livestock, with evidence of grazing and trampling by cattle.

Plate 6.2 ***Cycas megacarpa***

6.1.4 Pest flora species

In total 72 introduced flora were observed during surveys, of which 7 are listed as Category 3 Restricted Matter under the *Biosecurity Act 2014* and WoNS. Specifically, these include:

- Cat's claw creeper (*Dolichandra unguis-cati*);
- Common lantana (*Lantana camara*);
- Creeping lantana (*Lantana montevidensis*);
- Westwood pear (*Opuntia streptacantha*);
- Common pest pear (*Opuntia stricta*);
- Velvety tree pear (*Opuntia tomentosa*); and
- Parthenium (*Parthenium hysterophorus*).

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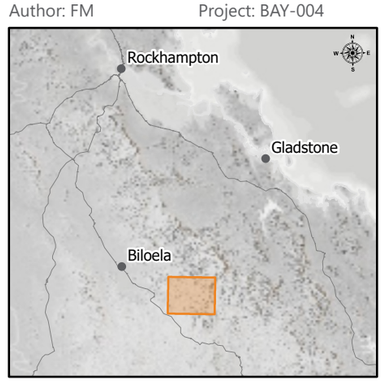
Threatened flora observations

Figure 6.2

- Project Boundary
- Study Area
- Turbine
- Disturbance Footprint
- *Cycas megacarpa*
- Watercourse area
- Creek and River
- Major Road
- Lot Type Parcel
- Easement

Date: 21/11/2022 Reviewed: CC

Author: FM Project: BAY-004



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Scale: 1:75,000@A3

Data Source(s):
Digital Cadastral Database - Department of Resources (2022)
vegetation Management Regional Ecosystems - Department of Environment and Science (2022)
Earthstar Geographics, © State of Queensland (Department of Resources) 2022, Esri, USGS, Maxar

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6.2 Fauna Survey Results

A revised likelihood of occurrence assessment has been undertaken based on the results of the desktop review and field surveys, this is presented in **Appendix C**.

6.2.1 Recorded Listed Fauna Species

Direct observation and / or evidence was recorded of the following EPBC Act-listed threatened and / or migratory species during field surveys for the Project:

- Central Greater Glider, (*Petauroides volans volans*);
- Squatter Pigeon (southern), (*Geophaps scripta scripta*);
- Fork-tailed Swift, (*Apus pacificus*);
- White-throated needletail (*Hirundapus caudacutus*); and
- Satin Flycatcher, (*Myiagra cyanoleuca*)

In addition, the following NC Act-listed species were recorded:

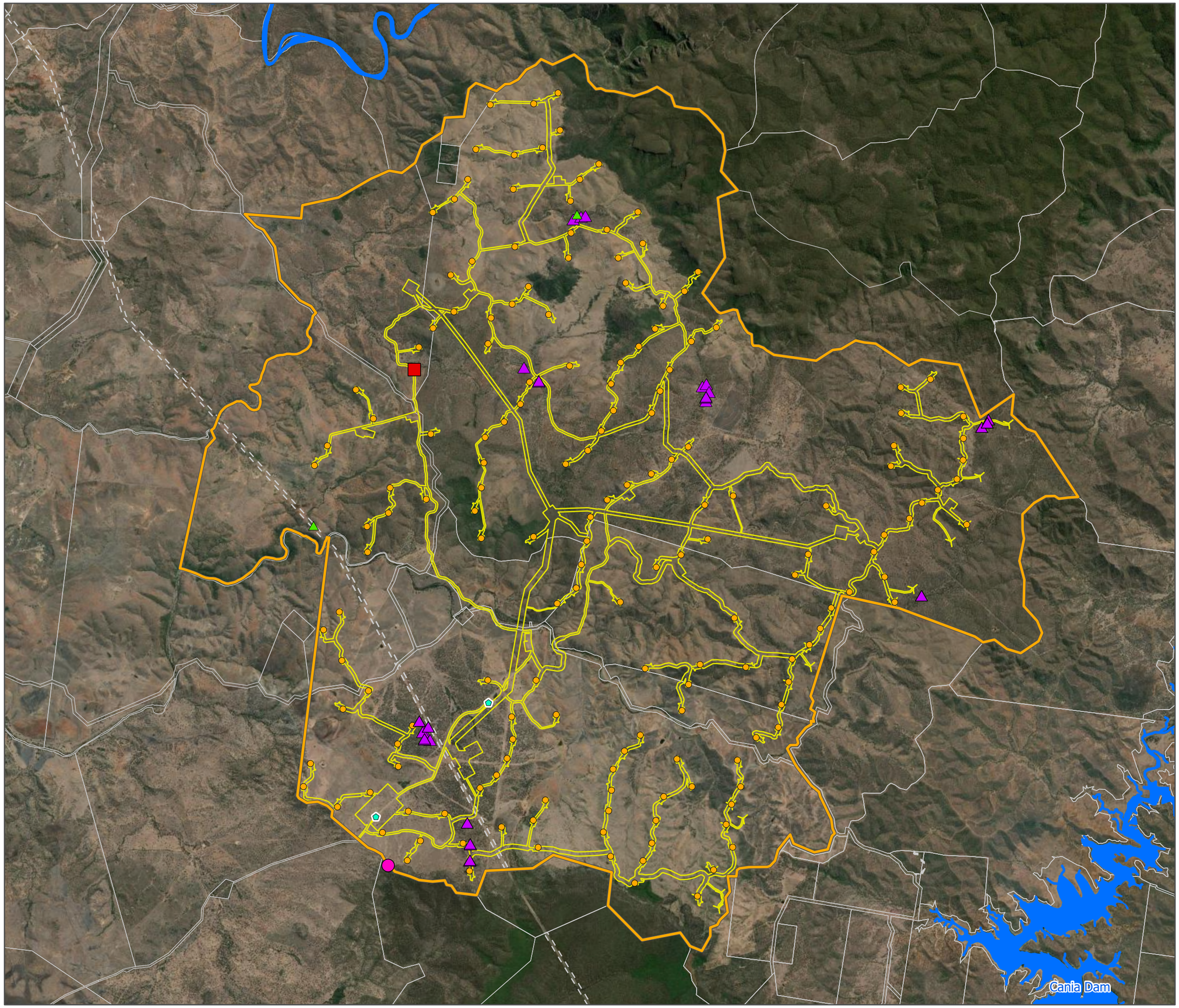
- Short-beaked Echidna, (*Tachyglossus aculeatus*).

The locations of these observations are shown on **Figure 6-3**. Descriptions of these species and the habitats they were recorded in are provided in the following sections.

6.2.1.1 Central greater glider (*Petauroides volans volans*)

Recent taxonomic studies have recognised distinct species across the range of the genus *Petauroides*, with unpublished data providing evidence that all *Petauroides* south of the Burdekin Gap (from around Proserpine) should be considered as two separate taxa with a point of contact between them in the vicinity of Coffs Harbour (DCCEEW, 2022). For the purposes of the EPBC Act, both species are incorporated in the listing for Greater Glider (southern and central), which is listed as Endangered under the EPBC Act and NC Act. Greater Gliders are predominantly restricted to eucalypt forest and woodlands, occurring in highest abundance in taller, montane, moist eucalypt forests with larger, relatively old trees and abundant hollows. The species prefers forests with a diverse range of eucalypt species, due to seasonal variation in its favoured tree species (DCCEEW, 2022). Even in suitable habitat, the distribution may be patchy (Kavanagh, 2000).

The species was recorded from 12 locations (6 in April 2022 and 6 in October 2022), mainly along major watercourses in the north and smaller tributaries in the southern portion of the Project area, see **Figure 6-3**. The species was commonly observed in large mature (30-50 cm DBH) ironbark species including *Eucalyptus crebra* and *Eucalyptus melanophloia* and less commonly in *Eucalyptus tereticornis*.



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Kariboe Wind Farm

Threatened Fauna Observations

Figure 6.3

- Project Boundary
- Turbine
- Disturbance Footprint
- Greater glider
- Squatter pigeon
- White-throated needletail
- Satin flycatcher
- Echidna
- Creek and River
- Major Road
- Lot Type Parcel
- Easement

Date: 21/11/2022 Reviewed: CC

Author: FM Project: BAY-004

0 1 2 km

Scale: 1:75,000@A3

Data Source(s):
Digital Cadastral Database - Department of Resources (2022)
vegetation Management Regional Ecosystems - Department of Environment and Science (2022)
Earthstar Geographics, © State of Queensland (Department of Resources) 2022, Esri, USGS

6.2.1.2 Fork-tailed Swift (*Apus pacificus*)

The fork-tailed swift is a non-breeding visitor to all states and territories of Australia. In Queensland, there are many coastal records of this species between Cooktown and Townsville, and they are also commonly found in drier habitat inland as far west as Longreach (SPRAT 2021). The species breeds in northern Asia and spends the non-breeding season (typically October – March inclusive) in Australia, moving further south as the summer progresses. In Australia, it is almost exclusively aerial, occurring from heights of less than 1 m up to more than 1,000 m above the ground.

The species was recorded from one location within the Project area during the BBUS program in June 2022 as shown in **Figure 6-3**, observed flying at an approximate height of 40 m. It was not recorded during later surveys.

6.2.1.3 Squatter Pigeon (southern) (*Geophaps scripta scripta*)

The squatter pigeon is listed as Vulnerable under the EPBC Act and NC Act. The known distribution of the Squatter Pigeon (southern) extends south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville, Queensland (Squatter Pigeon Workshop 2011; Cooper et al. 2014). The species is considered sedentary where water and food resources are reliable in the local region (Squatter Pigeon Workshop 2011) or locally nomadic when resources are unavailable (Frith 1982). The species inhabits open-forests to sparse, open woodland and scrub that are mostly dominated by *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp. or *Callitris*; remnant, regrowth or partly modified vegetation communities; and within 3 km of water bodies or courses.

The species was recorded incidentally from seven locations across the Project area (i.e. whilst travelling around the Project area, not during the timed counts) in June 2022, foraging amongst grass along vehicle tracks, see **Figure 6-3**. It was not recorded during the spring ecology surveys or BBUS program in October 2022.

6.2.1.4 Satin Flycatcher (*Myiagra cyanoleuca*)

The satin flycatcher is listed as Migratory under the EPBC Act and Special Least Concern under the NC Act. The species is widespread in eastern Australia and vagrant to New Zealand. In Queensland, it is widespread but scattered in the east, mainly on passage or non-breeding periods (DoE 2015). The species inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands near wetlands or watercourses, and coastal forests, woodlands, mangroves, dry open woodland with grassy ground cover during migration (BirdLife International 2017a). It is mostly absent from rainforests (SPRAT 2021) although wintering birds in northern Queensland will use the rainforest-gallery forests interface (DoE 2015).

The species was recorded during the BBUS program in June 2022 from two locations within the Project area as shown in **Figure 6-3,** observed flying <40 m within the canopy. It was also recorded from one location during the BBUS program in October 2022 flying relatively low (0-12 m).

6.2.2 Non-EVNT Fauna Observations

All observations of non-listed native fauna species were recorded during the fauna field surveys and BBUS program. A total of 248 vertebrate species were recorded during the surveys, including 14 amphibians, 160 birds, 18 bats, 21 non-volant mammals, 1 monotreme and 34 reptiles. A full species list is provided in **Appendix B**.

6.2.3 Fauna Habitats

Three broad habitat types were characterised across the Project area, as described below. Variations of these generalised habitats are typically associated with elevational gradients and geological attributes. Faunal assemblages that have potential to occur in these groups are cited where appropriate.

6.2.3.1 Eucalypt Woodland

Approximately 26% of the Project area supports a mix of dry open forests and grassy woodlands mostly dominated by *Eucalyptus crebra, Corymbia erythrophloia* and *E. melanophloia* with a sparse understorey (corresponding to REs 11.11.15, 11.12.1 and 11.8.4). The understorey is typically comprised of shrubs and grasses whilst trees range in heights from 10-20 metres and have a sparse canopy structure.

In most instances these communities support large, hollow-bearing trees which are recognised to provide habitat for glider species and hollow nesting birds whilst microhabitat such as cracks and crevices of exposed rocks, fallen timber and dense leaf litter provide habitat for reptiles and small ground-dwelling mammals.

6.2.3.2 Riparian Zones

Riparian habitats corresponding to REs 11.3.4, 11.3.25 and 11.3.26 are represented as narrow communities primarily consisting of 11.1 woodlands on alluvium with occasional small sections of dry rainforest type communities fringing ephemeral drainage and creek lines. These communities typically consist of Forest red gum (*Eucalyptus tereticornis*), River red gum (*E. camaldulensis*) and Silver-leaved ironbark (*E. melanophloia*). The canopy and mid-storey are relatively low with trees, a sparse or absent shrub layer and grassy ground layer. The understorey is characterised by low shrubs including *Eremophila mitchellii, Flindersia dissosperma, Citrus glauca* or *Petalostigma pubescens* and grasses such as *Bothriochloa bladhii* subsp. *bladhii*, *Aristida* spp., *Heteropogon contortus, Dichanthium* spp. and *Themeda triandra*. This structure provides rich habitat for small invertebrates and amphibian species. These areas also represent preferred habitats for folivores such as greater glider as associated moisture expression provides both favoured foraging tree species as well as large hollows for denning.

6.2.3.3 Microphyll/Notophyll Vine Forests

Several patches of simple notophyll vine forest (SNVF) represent approximately 3.3% of the total Project area, corresponding with REs 11.8.3, 11.10.8, 11.11.18, 12.11.4 and 12.12.18. Larger SNVF communities generally occupy valleys or slopes with southerly aspects on richer soils, whilst smaller patches of SNVF occur as a result of lower soil moisture availability, impeded drainage, drier climate, increased elevation and exposure, and less fertile soils. This community is characterised by the leaf size (medium sized leaves, 7.5-12.5 cm long) and described by the uniformity of tree basal diameter and the regularity of spacing between canopy trees which, as a result, provides even canopy height and crown cover. The provision of dense canopy cover offers sheltering opportunities for multiple faunal classes including threatened species such as the Black-breasted button-quail (*Turnix melanogaster*) and Northern quoll (*Dasyurus hallucatus*). The ground layer of these communities also provides terrestrial microhabitat such as rocks and crevices with abundant leaf litter.

6.2.4 Pest Fauna Species

Nine introduced fauna species were recorded during field surveys including 1 amphibian, 1 bird and 7 mammals. Specifically, these were:

- Cane toad (*Rhinella marina*);
- Common myna (*Acridotheres tristis*);
- Domestic dog (*Canis lupus familiaris*) – Category 3, 4, 6 under the *Biosecurity Act 2014*;
- Domestic cat (*Felis catus*);
- Feral pig (*Sus scrofa*) – Category 3, 4, 6 under the *Biosecurity Act 2014*;
- House mouse (*Mus musculus*);
- European rabbit (*Oryctolagus cuniculus*) – Category 3, 4, 5, 6 under the *Biosecurity Act 2014*;
- European brown hare (*Lepus europaeus*); and
- Feral red deer (*Cervus elaphus*) – Category 3, 4, 6 under the *Biosecurity Act 2014*.