Permit

Environmental Protection Act 1994

Environmental authority EPML00575913

This environmental authority is issued by the administering authority under Chapter 5 of the Environmental Protection Act 1994.

Environmental authority number: EPML00575913

Environmental authority takes effect on 13 August 2019

Environmental authority holder(s)

Name(s)	Registered address
STRADBROKE RUTILE PTY. LTD.	Level 16 111 Pacific Hwy NORTH SYDNEY NSW 2060 Australia

Environmentally relevant activity and location details

Environmentally relevant activity/activities	Location(s)
Schedule 2A 12: Mining mineral sand	ML1122
Schedule 2A 12: Mining mineral sand	ML1112
Schedule 2A 12: Mining mineral sand	ML1118
Schedule 2A 12: Mining mineral sand	ML1120
Schedule 2A 12: Mining mineral sand	ML1159
Schedule 2A 12: Mining mineral sand	ML1109
Schedule 2A 12: Mining mineral sand	ML1113
Schedule 2A 12: Mining mineral sand	ML1119

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Queensland Government

Environmentally relevant activity/activities	Location(s)
Schedule 2A 12: Mining mineral sand	ML1160
Schedule 2A 12: Mining mineral sand	ML1164
Schedule 2A 12: Mining mineral sand	ML1174
Schedule 2A 12: Mining mineral sand	ML1172
Schedule 2A 12: Mining mineral sand	ML1117
Schedule 2A 12: Mining mineral sand	ML1153
Schedule 2A 12: Mining mineral sand	ML1175
Schedule 2A 12: Mining mineral sand	ML1162
Schedule 2A 12: Mining mineral sand	ML1105
Schedule 2A 12: Mining mineral sand	ML1140
Schedule 2A 12: Mining mineral sand	ML1121
Schedule 2A 12: Mining mineral sand	ML1130
Schedule 2A 12: Mining mineral sand	ML1103
Schedule 2A 12: Mining mineral sand	ML1163

Additional information for applicants

Environmentally relevant activities

The description of any environmentally relevant activity (ERA) for which an environmental authority (EA) is issued is a restatement of the ERA as defined by legislation at the time the EA is issued. Where there is any inconsistency between that description of an ERA and the conditions stated by an EA as to the scale, intensity or manner of carrying out an ERA, the conditions prevail to the extent of the inconsistency.

An EA authorises the carrying out of an ERA and does not authorise any environmental harm unless a condition stated by the EA specifically authorises environmental harm.

A person carrying out an ERA must also be a registered suitable operator under the *Environmental Protection Act 1994* (EP Act).

Contaminated land

It is a requirement of the EP Act that an owner or occupier of contaminated land give written notice to the administering authority if they become aware of the following:

- the happening of an event involving a hazardous contaminant on the contaminated land (notice must be given within 24 hours); or
- a change in the condition of the contaminated land (notice must be given within 24 hours); or
- a notifiable activity (as defined in Schedule 3) having been carried out, or is being carried out, on the contaminated land (notice must be given within 20 business days);

that is causing, or is reasonably likely to cause, serious or material environmental harm.

For further information, including the form for giving written notice, refer to the Queensland Government website www.qld.gov.au, using the search term 'duty to notify'.

Take effect

Please note that, in accordance with section 200 of the EP Act, an EA has effect:

a) if the authority is for a prescribed ERA and it states that it takes effect on the day nominated by the holder of the authority in a written notice given to the administering authority-on the nominated day; or

b) if the authority states a day or an event for it to take effect-on the stated day or when the stated event happens; or

c) otherwise-on the day the authority is issued.

However, if the EA is authorising an activity that requires an additional authorisation (a relevant tenure for a resource activity, a development permit under the *Sustainable Planning Act 2009* or an SDA Approval under the *State Development and Public Works Organisation Act 1971*), this EA will not take effect until the additional authorisation has taken effect.

If this EA takes effect when the additional authorisation takes effect, you must provide the administering authority written notice within 5 business days of receiving notification of the related additional authorisation taking effect.

If you have incorrectly claimed that an additional authorisation is not required, carrying out the ERA without the

additional authorisation is not legal and could result in your prosecution for providing false or misleading information or operating without a valid environmental authority.

Filiz Tansley
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Date issued: 13 August 2019

Enquiries:
Minerals Business Centre
Department of Environment and Science

Phone: 07 4222 5352
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Obligations under the *Environmental Protection Act 1994*

In addition to the requirements found in the conditions of this environmental authority, the holder must also meet their obligations under the EP Act, and the regulations made under the EP Act. For example, the holder must comply with the following provisions of the Act:

- general environmental duty (section 319)
- duty to notify environmental harm (section 320-320G)
- offence of causing serious or material environmental harm (sections 437-439)
- offence of causing environmental nuisance (section 440)
- offence of depositing prescribed water contaminants in waters and related matters (section 440ZG)
- offence to place contaminant where environmental harm or nuisance may be caused (section 443)

Conditions of environmental authority

Statutory Conditions (North Stradbroke Island Protection and Sustainability Act 2011)
Note: Statutory conditions relate to mining activities on an 'Enterprise Mine Lease' and refer to the restricted mine path map (NSI 3) depicted in Appendix A.

Condition number	Condition
S1	If a condition of this environmental authority is inconsistent with a statutory condition, the statutory condition prevails to the extent of the inconsistency.
S2	Subject to condition S4, mining activities that are the winning of a mineral from the place where it occurs may be conducted only within the **restricted mine path** for an **Enterprise Mine lease**.
S3	Mining activities that are the winning of a mineral from the place where it occurs within the restricted mine path for an **Enterprise Mine lease** may be conducted only until 31 December 2019.
S4	Dredging may be conducted only within the **dredge path**.
S5	**Disturbance of land** may only occur within the **limit of disturbance**.

Agency interest: General

General

G1	This **environmental authority** authorises **environmental harm** referred to in the conditions. Where there is no condition or this **environmental authority** is silent on a matter, the lack of a condition or silence does not authorise **environmental harm**.
G2	In carrying out the **mining activity** authorised by this **environmental authority** on ML1109, **disturbance** of **land** must not be conducted within a Category A or B environmentally sensitive area.
G3	The **holder of this environmental authority** must: a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this **environmental authority** b) maintain such measures, plant and equipment in a proper and efficient condition c) operate such measures, plant and equipment in a proper and efficient manner d) ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this **environmental authority** are properly calibrated.

Monitoring

G4	Except where specified otherwise in another condition of this **environmental authority**, all monitoring records or reports required by this **environmental authority** must be kept for a period of not less than 5 years.
G5	A monitoring program must be conducted within the **zone of impact** to monitor any potential **environmental harm**.
G6	A written monitoring plan that describes the monitoring program must be prepared and maintained. The written monitoring plan must include as a minimum: a) locations for monitoring/sampling; b) parameters monitored; c) frequency of monitoring/sampling; and d) **trigger level(s)** for each location.
G7	The written monitoring plan must be submitted to the **administering authority** by 31 May each year.

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G8 The monitoring plan must include a process for dealing with the exceedance of the **trigger level(s)** including the following steps:

a) evaluation of the **risk** associated with the exceedance in accordance with the **risk treatment** process;
b) implementation of the actions arising from the **risk treatment** process which may include measures to prevent unauthorised **environmental harm**; and
c) an obligation to notify the **administering authority** of the exceedance as soon as practicable and to notify the outcome of the **risk treatment** process.

Financial Assurance

G9 The activity must not be carried out until the **holder of this environmental authority** has given financial assurance to the **administering authority** as security for compliance with this **environmental authority** and any costs or expenses, or likely costs or expenses, mentioned in section 298 of the Act.

G10 The amount of financial assurance must be reviewed by the **holder of this environmental authority** when a **plan of operations** is amended or replaced or the authority is amended.

Risk management

G11 The **holder of this environmental authority** must develop and implement a risk management system for mining activities which mirrors the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, to the extent relevant to environmental management, by no later than 3 months from the date this **environmental authority** takes effect.

Notification of emergencies, incidents and exceptions

G12 The **holder of this environmental authority** must notify the **administering authority** by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this **environmental authority**.

G13 Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the administering authority, including the following:

a) results and interpretation of any samples taken and analysed.
b) outcomes of actions taken at the time to prevent or minimise unlawful **environmental harm.**
c) proposed actions to prevent a recurrence of the emergency or incident.

Complaints

G14 The **holder of this environmental authority** must record all environmental complaints received about the mining activities including:

a) name, address and contact number for of the complainant
b) time and date of complaint
c) reasons for the complaint
d) investigations undertaken
e) conclusions formed
f) actions taken to resolve the complaint
g) any abatement measures implemented
h) person responsible for resolving the complaint.

G15 The **holder of this environmental authority** must, when requested by the **administering authority**, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the **administering authority** to investigate any complaint of **environmental harm**. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the **administering authority** within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the **administering authority** to undertake the investigation.

Third Party Reporting

G16 The **holder of this environmental authority** must:

a) within 1 year of the commencement of this **environmental authority**, obtain from an **appropriately qualified person** a report on compliance with the conditions of this **environmental authority**;
b) obtain further such reports at regular intervals, not exceeding 3 yearly intervals, from the completion of the report referred to above; and
c) provide each report to the **administering authority** within 90 days of its completion.

G17 Where a condition of this **environmental authority** requires compliance with a standard, policy or guideline published externally to this **environmental authority** and the standard is amended or changed subsequent to the issue of this **environmental authority**, the **holder of this environmental authority** must:

a) comply with the amended or changed standard, policy or guideline within 2 years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation, the time specified in that condition;
b) until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Annual Environmental Report

G18 An Annual Environmental Report (AER) that assesses the environmental performance of the **holder of this environmental authority** must be submitted to the **administering authority** at each **annual return**. The report must address:

a) status of compliance with the conditions of the **environmental authority**;
b) monitoring results and their conformance with the **trigger level(s)**; and
c) details of environmental incidents and complaints.

Agency interest: Air

Dust Nuisance

A1 When requested by the **administering authority**, dust and particulate monitoring must be undertaken within a reasonable and practicable timeframe nominated by the **administering authority** to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of an **authorised person**) of **environmental nuisance** at any **sensitive place**, and the results must be notified within fourteen (14) days to the **administering authority** following completion of monitoring.

Point Source Releases to Air / Dust and Particulate Monitoring

A2 The **holder of this environmental authority** shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the dust and particulate matter emissions generated by the mining activities do not cause exceedances of the following levels when measured at any **sensitive** or **commercial place**:

a) Dust deposition of 120 milligrams per square metre per day, averaged over 1 month, when monitored in accordance with the most recent version of *Australian Standard AS3580.10.1 Methods for sampling and analysis of ambient air–Determination of particulate matter–Deposited matter - Gravimetric method*.
b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24-hour averaging time, for no more than 5 exceedances recorded each year, when monitored in accordance with the most recent version of either:
    (i) *Australian Standard AS3580.9.6 Methods for sampling and analysis of ambient air–Determination of suspended particulate matter–PM10 high volume sampler with size-selective inlet - Gravimetric method*; *or*
    (ii) *Australian Standard AS3580.9.9 Methods for sampling and analysis of ambient air–Determination of suspended particulate matter–PM10 low volume sampler–Gravimetric method*.

c) A concentration of particulate matter with an aerodynamic diameter of less than 2.5 micrometres (PM2.5) suspended in the atmosphere of 25 micrograms per cubic metre over a 24-hour averaging time, when monitored in accordance with the most recent version of *AS/NZS3580.9.10 Methods for sampling and analysis of ambient air−Determination of suspended particulate matter−PM (sub)2.5(/sub) low volume sampler−Gravimetric method.*

d) A concentration of particulate matter suspended in the atmosphere of 90 micrograms per cubic metre over a 1 year averaging time, when monitored in accordance with the most recent version of *AS/NZS3580.9.3:2003 Methods for sampling and analysis of ambient air−Determination of suspended particulate matter−Total suspended particulate matter (TSP)−High volume sampler gravimetric method*.

Agency interest: Waste Management

WM1 Unless otherwise permitted by the conditions of this **environmental authority** or with prior approval from the **administering authority** and in accordance with a relevant standard operating procedure, waste must not be burnt.

WM2 The **holder of this environmental authority** may burn vegetation cleared in the course of carrying out extraction activities provided the activity does not cause **environmental harm** at any **sensitive place** or **commercial place**.

Tailings Disposal

WM3 The disposal of zircon mags must be at least 10 metres below final rehabilitation **constructed landform**.

WM4 The **trigger level** for radiation is 0.12µSv per hour above background, at one (1) metre above ground level.

WM5 Radiation levels must be monitored at the dry mill tailings disposal areas within one (1) month of the completion of the final **constructed landform** reshaping activities.

Agency interest: Noise

Noise Nuisance

N1 When requested by the **administering authority**, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the **administering authority** to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of an **authorised person**) of **environmental nuisance** at any **sensitive place** or **commercial place**, and the results must be notified within fourteen (14) days to the **administering authority** following completion of monitoring.

Noise limits

N2 The **holder of this environmental authority** must ensure that noise generated by the mining activities does not cause the criteria in **Table N1** – **Noise limits** to be exceeded at a **sensitive place** or **commercial place**.

Table N1 – Noise Limits

Sensitive Place						
Noise level dB(A) measured as:	**Monday to Saturday**			**Sundays and Public Holidays**		
	7am to 6pm	6pm to 10pm	10pm to 7am	9am to 6pm	6pm to 10pm	10pm to 9am
LAeq, adj, 15 mins	CV = 50 AV = 5	CV = 45 AV = 5	CV = 40 AV = 0	CV = 45 AV = 5	CV = 40 AV = 5	CV = 35 AV = 0

LA1, adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5
Commercial Place						
Noise level dB(A) measured as:	**Monday to Saturday**			**Sundays and Public Holidays**		
	7am to 6pm	6pm to 10pm	10pm to 7am	7am to 6pm	6pm to 10pm	10pm to 7am
LAeq, adj, 15 mins	CV = 55 AV = 10	CV = 50 AV = 10	CV = 45 AV = 5	CV = 50 AV = 10	CV = 45 AV = 10	CV = 40 AV = 5

Table N1 – Noise limits notes:

1. *CV = Critical Value*
2. *AV = Adjustment Value*
3. *To calculate noise limits in Table N1:*
   If bg ≤ (CV – AV):

   Noise limit = bg + AV
   If (CV – AV) < bg ≤ CV:
   Noise limit = CV
   If bg > CV:
   Noise limit = bg + 0
4. *In the event that measured bg (LA90, adj, 15 mins) is less than 30 dB(A), then 30 dB(A) can be substituted for the measured background level*
5. *bg = background noise level (LA90, adj, 15 mins) measured over 3-5 days at the nearest sensitive receptor*
6. *If the project is unable to meet the noise limits as calculated above alternative limits may be calculated using the processes outlined in the "Planning for Noise Control" guideline.*

Agency interest: Groundwater

Groundwater

GW1 The **holder of this environmental authority** must develop and implement, an ongoing Groundwater Monitoring Program (GMP) as part of mine planning and the **mining activity.**

The GMP must comply with the following requirements:

a) the development of a suitable groundwater monitoring network (i.e bores/ piezometers), to monitor the level and flow of groundwater potentially impacted by the ongoing **mining activity**;
b) **pre-mining activity** conceptual modelling;
c) **pre-mining activity** predictive groundwater computer models;
d) standing water levels and total well depths in metres must be measured and recorded during each monitoring event and must be reported as the depth in metres from the top edge of the highest point of the casing collar to the water surface within the bore;

GW2

e) groundwater level trends and flows must be compared to groundwater models for model verification and confirmation or reassessment of groundwater level and flow predictions; and
f) evaluation of the **risk** of changes in groundwater levels and flows including appropriate modifications to the **mine path** and **control measures** to appropriately manage water levels to prevent or minimise **environmental harm**.
g)

GW3 The groundwater monitoring network referred to in condition GW2 must:

a) be installed and maintained by an **appropriately qualified person**; and
b) be constructed in accordance with the Agriculture and Resource Management Council of Australia and New Zealand manual titled Minimum Construction Requirements for Water Bores in Australia, Edition 2, Revised September 2003, or more recent editions or supplements to that document as such become available.

GW4 Any record made of the results of groundwater monitoring made in accordance with conditions GW2 and GW3 must be kept for not less than fifteen (15) years from the date the record was made.

GW5 The **holder of this environmental authority** must ensure that the groundwater monitoring data gathered in accordance with this **environmental authority** is analysed and interpreted to assess the nature and extent of any **environmental harm** from the **mining activity**. The assessment must also include, but not be limited to, the location, nature (confined, unconfined etc.) of each aquifer, define groundwater contours and indicate direction of flow. The data collation, analysis and assessment must be conducted by an **appropriately qualified person** and must be submitted to the **administering authority** upon request.

Agency interest: Land and Rehabilitation

L1 Rehabilitation must commence progressively in accordance with the **plan of operations**.

Rehabilitation acceptance criteria

L2 All **land** disturbed by the **mining activity** must be rehabilitated as **native bushland** to ensure sustainable natural ecosystems at the point of progressive certification and surrender.

L3 All **land** disturbed by the **mining activity** must be free from **waste** (excluding **tailings** generated from the **mining activity** that is used to construct **landform**).

Landform

L4 All **constructed landform** built **pre- 1 January 2007** must at least comply with the criteria specified in Table L1.

Table L1 – Pre-1 January 2007 Landform Criteria

Mine Site	Description of Area	Total Area	Type 1 Criteria		Type 2 Criteria		Type 3 Criteria
		Area (ha)	Area (ha)	Prop. (%)	Area (ha)	Prop. (%)	Prop. (%)
Amity	Amity	269.3	40.6	15.1	221.9	82.4	72.2
Bayside	Bayside	748.6	166.9	22.3	473.8	63.3	100.0
Gordon	Gordon	1212.0	359.9	29.7	621.7	51.3	83.7
Ibis	Ibis	453.3	117.4	25.9	309.1	68.2	94.3
Yarraman	Yarraman	89.1	3.9	4.4	71.8	80.6	67.7
Enterprise and Yarraman	Yellow Violet complex	540.7	223.8	41.4	539	99.7	95.6
Enterprise and Yarraman	Blue Lake Complex	644.5	447.9	69.5	643.2	99.8	90.7

L5 In the event that the areas listed in Table L1 are re-disturbed by the **mining activity** resulting in the reconstruction of **landform post- 1 January 2007**, the criteria referred to in condition L7 will apply to the re-mined area.

L6 In the event that the areas listed in Table L1 are re-disturbed by the **mining activity** resulting in changes to the **pre- 1 January 2007** values for area and proportion listed in Table L1, the **holder of this environment authority** must advise the **administering authority** in the **plan of operations** the changed values for area or proportion that will apply to the landform **pre-1 January 2007.**

L7 Subject to condition L9, all **constructed landform** built **post- 1 January 2007** must comply with the following criteria:

a) slopes of **constructed landform** do not exceed 25 degrees from horizontal; and
b) 80% of the area of the **mining block** must have the **aspect element(s)** that existed in the **mining block, pre-mining activity**, returned to the same location in the **constructed landform** where the **volume difference index (VDI)** of any **mining block** is within the range of -2.5 to +5.5; and
c) regardless of the **volume difference index (VDI)** in conditions L7(b):
   (i) at least 75% of the area of the **constructed landform** at each **mine site** must contain the **terrain element(s)** present in the **baseline topography** within the same **geomorphology unit**;
   (ii) the area covered by each **terrain element(s)** within the **geomorphology unit** in the **constructed landform** must not be less than 30% of the area covered by that **terrain element(s)** in the **baseline topography** within the same **geomorphology unit**; and
   (iii) the number of **terrain element(s)** in a **mining block** must represent;
      (A) at least 80% of the number of **terrain element(s)** present in the **baseline topography** in that **mining block** where the **volume difference index (VDI)** of the **mining block** is positive; or
      (B) B) at least 50% of the number of **terrain element(s)** present in the **baseline topography** in that **mining block** where the **volume difference index (VDI)** of the **mining block** is negative.

L8 In the event that the **landform** in a **mining block** cannot comply with the criteria in condition L7(c) due to compliance with conditions L7(a) and L7(b), the requirements of condition L7(a) and L7(b) take precedence to the extent of any inconsistency.

L9 The **constructed landform** does not have to comply with the criteria in condition L7 where the construction of the **landform** compromises the safety of employees.

L10 In constructing **landform** in areas specified in Table L1, it is preferable for the **baseline topography** to be used for determining the **aspect element(s)**, rather than the **pre-mining topography**.

Geotechnical stability

L11 The geotechnical stability of the **constructed landform** must have a **factor of safety** of not less than 1.3.

L12 A **Registered Professional Engineer of Queensland (RPEQ)** possessing suitable qualifications and experience must certify the geotechnical stability required by condition L11 has been achieved in the **constructed landform.**

Erosion

L13 All **land** disturbed by the **mining activity** must:

(a) meet the criteria in conditions in L15 and L17 regarding revegetation; and
(b) have the equivalent proportions of **litter** to that present in **representative unmined areas** within the **authorised mining tenement(s)**.

Revegetation

L14 The assessment of revegetated areas must comprise of sampling consistent with the **Queensland Herbarium Mapping Methodology** with appropriate modification for scale.

L15 Subject to condition L13 all **land** disturbed by the **mining activity** that has been revegetated **post- 30 June 1987** must comply with the criteria specified in Table L2.

Table L2 – Post- 30 June 1987 Revegetation Criteria.

Performance Measure Category	Stratum	Performance Measure
Number of Species	Trees	All **native** species present in the **representative unmined plots** are present in the **rehabilitation**.
	Trees and Understorey	The **native** species present in the **rehabilitation** is not **statistically significantly** less than 75% of the **native** species present in the **representative unmined plots** for the **vegetation community**.
		All significant species listed in **The Register of the National Estate** must be present in the **rehabilitation**.
Density	Trees	The mean stem count of all **native** tree species greater than 2 m in height in the **rehabilitation** is not **statistically significantly** less than 75% of the mean value recorded in **the representative unmined plots** for the **vegetation community**. For each **native** tree species present in the **rehabilitation**, the mean stem count of **native** trees greater than 2 m in height in the **rehabilitation** is not **statistically significantly** less than 50% of the mean value recorded for the same **native** tree species in the **representative unmined plots** for the **vegetation community**.
	Trees and Understorey	The mean stem count of **native** species in the **rehabilitation** is not **statistically significantly** less than 75% of the mean value recorded in the **representative unmined plots** for the **vegetation community**.
Cover	Trees	The mean **projective foliage cover (PFC)** of **native** species in the **rehabilitation** is not **statistically significantly** less than 75% of the mean value recorded in the **representative unmined plots** for the **vegetation community**.
	Understorey	The mean **projective foliage cover (PFC)** of native species in the **rehabilitation** is not **statistically significantly** less than 75% of the mean value recorded in the **representative unmined plots** for the **vegetation community**.
	Ground	The mean **projective foliage cover (PFC)** of **native** species in the **rehabilitation** is not **statistically significantly** less than 65% of the mean value recorded in the **representative unmined plots** for the **vegetation community**.

L16 Notwithstanding condition L15, the species specified in Table L3 must be present in all **land** disturbed by the **mining activity** that has been revegetated **post- 30 June 1987.**

Table L3 – Species to be Present in Post- 30 June 1987 Revegetation

Species	Common Name	Mines where species present pre-mining activity
Melichrus procumbens	-	Bayside, Enterprise, Gordon and Ibis
Calytrix tetragona	Fringe-myrtle	Gordon and Ibis
Eriachne insularis	Wanderrie grass	Bayside, Enterprise, Gordon and Ibis
Boronia safrolifera	Safrole boronia	Vance
Banksia spinulosa var coliina	Golden candlesticks	Enterprise and Vance
Petrophile canescens	Conesticks	Amity, Bayside, Dunwich, Enterprise, Gordon, Ibis, Vance and Yarraman
Petrophile shirleyae	Conesticks	Enterprise and Vance
Podocarpus spinulosus	Spiny-leaf podocarp or dwarf plum pine	Enterprise and Vance
Eucalyptus planchoniana	Planchon's stringybark	Amity, Bayside, Enterprise, Gordon, Ibis, Vance and Yarraman

L17 Subject to condition L13 all **land** disturbed by the **mining activity** that has been revegetated **pre- 30 June 1987** must comply with the criteria specified in Table L4.

Table L4 – Pre- 30 June 1987 Revegetation Criteria

Performance Measure Category	Stratum	Performance Measure
Number of Species	Trees	The **projective foliage cover (PFC)** of *Acacia concurrens* (black wattle) in the **rehabilitation** is less than 40%.
	Trees and Understorey	For each **vegetation community**, the mean number of **native** species recorded in the **rehabilitation** is not less **statistically significantly** than 50% of the mean recorded in the **representative unmined plots**.
Density	Trees	For each **vegetation community**, the mean stem count of each **nominated species** greater than 2 m in height in the **rehabilitation** is between 50 to 200% of the mean value recorded in the **representative unmined plots**.
Cover	Trees	For each **vegetation community**, the mean **projective foliage cover (PFC)** of **native** species in the **rehabilitation** is not statistically significantly less than 75% of the mean value recorded in the **representative unmined plots**.
	Understorey	For each **vegetation community**, the mean **projective foliage cover (PFC)** of **native** species in the **rehabilitation** is not **statistically significantly** less than 50% of the mean value recorded in the **representative unmined plots**.

	Ground	For each **vegetation community**, the mean **projective foliage cover (PFC)** of **native** species in the **rehabilitation** is not **statistically significantly** less than 40% of the mean value recorded in the **representative unmined plots**.

L18 The revegetation criteria specified in Table L2 and Table L4 for the number of species do not apply:

a) where specific projects approved by the **administering authority** have been undertaken to increase fauna species diversity and abundance; and
b) to the fringing vegetation surrounding artificially created water bodies or watercourses
c) approved by the **administering authority**.

Note- For the purposes of this condition, the following are considered to have been approved by the **administering authority**:

(i) *Eucalyptus tereticornis* planted at the Bayside Mine for koalas;
(ii) unnamed artificial wetland at the Bayside Mine that is inhabited by significant wallum frogs, other frog species, invertebrates and freshwater turtles; and
(iii) Dam 1 and Dam 4 artificial wetlands at the Yarraman Mine that are inhabited by significant wallum frogs.

L19 The following weed species must not be present in the **rehabilitation** in densities that prevent the revegetation criteria in Table L2 and Table L4 from being achieved.

(a) *Pinus* spp; and

(b) *Poaceae* spp, including *Brachiaria decumbens* (signal grass), *Megathyrus maximus var.pubiglumis* (green panic), *Megathyrus maximus var. maximus* (guinea grass), *Mellinis minutiflora* (molasses grass), *Andropogon virginicus* (whiskey grass) and *Mellinis repens* (red natal grass).

L20 All **land** disturbed by the **mining activity** and rehabilitated **post- 30 June 1987** that have already been mined and rehabilitated prior to 30 June 1987 must comply with condition L17.

Water Quality

L21 The quality of **waters** must meet one of the following criteria in the order of preference listed and be accompanied by justification to support the use of that criteria:

a) the difference in **relevant water quality parameters** between **pre-mining activity** and **post-mining activity** is not **statistically significant** (i.e. "historic assessment") – most preferred criteria;
b) the difference in **relevant water quality parameters** between the **post-mining activity** receiving water quality and the quality in a reference site is not **statistically significant** for the corresponding time period (i.e. "reference site assessment");
c) water quality guidelines developed in accordance with the process specified in the *Monitoring and Sampling Manual 2009 (Version 2, September 2010)* or revisions or more recent editions of this document as they become available for the water and for the **relevant water quality parameters** and criteria in these guidelines have been consistently achieved **post-mining activity**.
d) water quality guidelines developed in accordance with the process specified in the Australian and New Zealand Environment and Conservation Council (**ANZECC**) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* dated 2000 or revisions or more recent editions of this document as they become available for the water and for the **relevant water quality parameters** and criteria in these guidelines have been consistently achieved **post-mining activity** (i.e "**ANZECC** process")- least preferred criteria.

L22 The reference site required by condition L21(b):

a) must not have been impacted by the **mining activity**; and
b) must be nominated by the **holder of this environmental authority;** and

c) must be acceptable to the **administering authority** prior to use;
d) must be in a similar ecological setting.

L23 The water quality monitoring required to be undertaken by condition L21 must be undertaken at a frequency of not less than quarterly whilst **mining operations** are being undertaken and not less than biannually when **mining operations** have ceased.

Contaminated Land and Groundwater

L24 Before applying for surrender of a mining lease, the **holder of this environmental authority** must (if applicable) provide to the **administering authority** a site investigation report under the Act, in relation to any part of the mining lease which has been used for notifiable activities or which the holder is aware is likely to be contaminated land, and also carry out any further work that is required as a result of that report to ensure that the land is suitable for its final land use.

L25 Notwithstanding condition L21, a Site Investigation Report, prepared in accordance with the *Environmental Protection Act 1994* and *Guidelines for contaminated land professionals (DEHP, 2012)* or revisions or more recent editions of this document as they become available, must be submitted to the **administering authority** to:

a) demonstrate that the subject **land** and the groundwater affected by the diesel spill at the Amity Mine is suitable for the intended use; and
b) enable the **administering authority** to remove the site from the **Environmental Management Register (EMR).**

L26 Notwithstanding condition L21, a Salinity Investigation Report of the groundwater of the Amity Mine dredge areas and associated water expressions (i.e. Amity Swamp) must be submitted to the **administering authority** to:

a) provide and analyse water quality monitoring results; and
b) b) enable recommendations on the assessment of the rehabilitation success.

L27 The information required by conditions L25 and L26 must be reviewed and certified by an independent Appropriately Qualified Person before being submitted to the **administering authority**.

L28 Water quality monitoring required for the Salinity Investigation Report must be undertaken by a suitably qualified person in accordance with the latest edition of the *Monitoring and Sampling Manual 2009 (Version 2, September 2010).*

L29 Water quality monitoring required for the Salinity Investigation Report must be undertaken from a sufficient number of sampling locations to provide **representative** data and enable an assessment of the rehabilitation success.

Water Level

L30 **Acceptance criteria** for water level are not deemed to be met until:

a) an analysis of water level monitoring is undertaken to compare:
   (i) the historical water levels of the nominated waterbodies specified in Table L5, including **pre-mining activity** and **post-mining activity**, for a period of not less than ten (10) years; and
   (ii) seasonal variations for a period of not less than five (5) years; and
   (iii) the impact, if any, of the **mining activity** on the water levels of the nominated waterbodies specified in Table L5; and
b) water levels of the nominated waterbodies specified in Table L5 **post-mining activity**:
   (i) are not **statistically significant** to the **pre-mining activity** water levels; or
   (ii) any **statistically significant** variation to the **pre-mining activity** water levels must not be due to the **mining activity**.
c) it is demonstrated that there is no adverse impact on vegetation communities that are reliant upon a range in water level.

Table L5 – **Nominated Waterbodies**

Mine Site	Waterbody Name	Within authorised mining tenement(s)	Not within authorised mining tenement(s)
Amity	Welsby Lagoon	No	Yes
	Amity Swamp	Yes	
	Flinders Swamp	No	Yes
Bayside	Kounpee Trench (also known as Wallen Wallen)	Yes	No
	Wallen Wallen Swamp	Yes	No
	Lake Kounpee South	Yes	No
	Kounpee Swamp	Yes	Yes
	Lake Kounpee	Yes	Yes
	Blaksley Lagoon	Yes	Yes
	Shag Lagoon	Yes	Yes
	Black Snake Lagoon	Yes	Yes
Gordon	South Lagoon and Unnamed wetlands	Yes	Yes
	Canaipa Swamp	Yes	No
	Native Companion Lagoon	Yes	Yes
	Duck Lagoon	Yes	Yes
Ibis	Ibis Central Lagoon	No	Yes
	Ibis Lagoon	No	Yes
	Dakka Bin Wet Heaths	No	Yes
	Bumbaree Swamp	No	Yes
	Little Canalpin Creek	Yes	No
	Little Canalpin Swamp	Yes	No
	Canalpin Swamp	Yes	No
	Jaragil Lagoon	Yes	No
	Mungaree Lagoon	Yes	No
	Odgee Lagoon	Yes	No
	Lamberts Swamp	Yes	No
Enterprise	Freshwater Creek	No	Yes
	Eighteen Mile Swamp	Yes	Yes
	TAZI Trench	No	Yes
	Herring Lagoon	Yes	Yes
Yarraman	Yarraman Dam 1	Yes	No
	Yarraman Dam 4	Yes	No
	Yarraman Lake	Yes	Yes
	Keyhole Lakes 2 and 3		Yes

	Fisherman's Creek	Yes	Yes

L31 The water level monitoring required to be undertaken by condition L30 must be undertaken at a frequency of not less than quarterly.

Fauna

L32 The **holder of this environmental authority** must demonstrate that populations of endangered, vulnerable rare or near threatened wildlife, as specified in the *Nature Conservation Act 1992* and subordinate legislation, on the **authorised mining tenement(s)** will return to levels equivalent to other similar habitats on North Stradbroke Island.

Infrastructure

L33 All infrastructure constructed, by or for, the environmental authority holder to support or facilitate the mining activity, must be removed prior to surrender of the enviornmetnal authority except where agreed in writing by the landowner or landholder that the infrastructure is to be transferred to the landowner or landholder and will remain on the land and/or where the landowner or landholder has accepted responsitility for any ongoing maintenance or monitoring.

Note: Condition L33 does not negate any requirements of the *Mineral Resources Act 1989* including any conditions for the authorised mining tenements(s).

Definitions

Key terms and/or phrases used in this document are defined in this section and **bolded** throughout this document. Applicants should note that where a term is not defined, the definition in the *Environmental Protection Act 1994*, its regulations or environmental protection policies must be used. If a word remains undefined it has its ordinary meaning.

'acceptance criteria' means the measures by which the actions implemented to rehabilitate the land are deemed to be complete (same as completion criteria).

'**administering authority'** means the Department of Environment and Heritage Protection, or its successor.

'annual return' means the return required by the annual notice (under section 308 of the *Environmental Protection Act 1994*) for the **environmental authority** for the **mining activity**.

'aspect element(s)' means a discreet area containing a specific range of aspect values delineated at a mapping scale of 1:25,000. Aspect is the dominant orientation of the landform element at that location. The **aspect elements** and their values are specified in the table below:

Aspect Element	**East/West Aspect (degrees)**		**North/South Aspect (degrees)**	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
1	15.5	24.9	93.1	20.3
2	93.0	56.2	116.5	46.0
3	113.9	33.0	39.0	25.5
4	53.0	28.4	132.7	28.1

5	37.3	28.5	61.8	22.1
6	143.3	27.7	61.6	22.2
7	107.9	31.9	148.6	27.6
8	165.7	24.5	96.3	18.7
9	94.1	26.0	20.4	18.1
10	140.4	30.6	122.1	23.8
11	61.0	29.4	40.7	24.2
12	146.4	35.7	72.9	27.0
13	151.0	28.6	112.1	21.7
14	22.5	24.1	74.7	18.4
15	151.8	25.1	68.2	19.7
16	135.3	27.2	52.8	20.6
17	33.7	29.0	114.5	24.5
18	166.1	25.5	85.1	18.0
19	132.8	31.9	127.1	26.7
20	29.5	53.6	32.0	51.3
21	68.6	34.5	142.6	33.3
22	138.1	41.8	71.9	32.1
23	51.9	33.9	52.7	24.2
24	163.5	23.2	78.1	15.8

‘appropriately qualified person’ means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

‘authorised mining tenement(s)’ means those mining tenements listed on page 1 of this **environmental authority.**

‘authorised person’ means a person holding office as an authorised person under an appointment under the *Environmental Protection Act 1994* by the chief executive.

'ANZECC' means the Australian and New Zealand Environmental Council (ANZECC) and its successor/s (i.e. the Environment Protection and Heritage Council (EPHC) and the Natural Resource Management Ministerial Council (NRMMC)).

'baseline topography' means the topography of the **authorised mining tenement(s)** on North Stradbroke Island as at 1964. This topography is considered to be the **pre-mining activity** topography where areas have historically been mined.

'commercial place' means a workplace used as an office or for business or commercial purposes, which is not part of the **mining activity** and does not include employees' accommodation or public roads.

'constructed landform' means those parts of the **authorised mining tenement(s)** that have been mined and/or received **tailings** for disposal. This includes dredge and dry mining pits, final voids and off-path tailings areas.

'control measures' means actions that can be taken in order to minimise **environmental impact(s)** or **environmental harm**. Control measures can be, but are not limited to planning, procedural or engineering controls. Control measures has the same intent as **risk treatment**.

'disturbance of land' means any of the following—

a) compacting, removing, covering, exposing or stockpiling earth;
b) removing or destroying vegetation or topsoil from land to an extent that the land is susceptible to erosion;
c) carrying out mining;
d) submerging an area with tailings or waste;
e) constructing infrastructure on land, including roads, tracks, bridges, culverts, dams, buildings, fixed
f) machinery, hardstand areas, airstrips, and helipads;
g) releasing contaminants into the soil or subsoil.

'dredge path' for an Enterprise Mine lease, means the area shown as the dredge path for the lease on the **restricted mine path map**.

'dry mining area' for an Enterprise Mine lease, means the area shown as dry mining for the lease on the **restricted mine path map.**

'EA' means environmental authority.

'EC' means electrical conductivity.

'Enterprise Mine' includes the **Enterprise Mine leases** and ancillary leases including ML1113, ML1119, ML1130, ML1153, ML1162, ML1163.

'Enterprise Mine Lease' means mining lease 1105, mining lease 1117 or mining lease 1120.

'environment' has the meaning given in the *Environmental Protection Act 1994.*

'environmental authority' means **environmental authority** under the *Environmental Protection Act 1994.*

'environmental harm' has the meaning given in the *Environmental Protection Act 1994.*

'Environmental Management Register (EMR) means the register kept by the **administering authority** under Chapter 7, Part 8 of the *Environmental Protection Act 1994.*

'environmental nuisance' has the meaning given in the *Environmental Protection Act 1994.*

'environmental value(s)' has the meaning given in the *Environmental Protection Act 1994.*

'expected impact(s)' means the predicted changes under normal conditions of a value subject to the influence of the authorised **mining activity**. Methods available for the determination of expected impacts include:

- predictions based on historical data;

- knowledge based intuition;
- numerical analysis; and
- modelling.

'factor of safety' means the ratio of resisting forces to driving forces. The resisting force is the friction developed in a material along a potential failure plane under given loading conditions. The driving force is primarily gravity but can also include vibration loading and unbalanced groundwater pressures.

'geomorphology unit' means a sub-province as mapped by the Geological Survey of Queensland in Cranfield, L.C and Tuttle, J. (2002) *South-East Queensland Region Geoscience Data Set SEQ GIS Version 2 – Data for exploration and land use* or revisions of this data set as they become available.

'**holder of this environmental authority'** means the holder of this **environmental authority.**

'infrastructure' means water storage dams, levees, roads and tracks, buildings and other structures built for the purpose of the **mining activity**.

'key environmental value(s)' means naturally occurring surface water bodies with associated aquatic flora and fauna communities that represent a surface expression of the main groundwater aquifer or are perched above the main aquifer due to the presence of one or more indurated layers.

'land' means land excluding waters and the atmosphere, that is, the term has a different meaning from the term as defined in the *Environmental Protection Act 1994*. For the purposes of the *Acts Interpretation Act 1954*, it is expressly noted that the term 'land' in this **environmental authority** relates to physical land and not to interests in land.

'land use' – means the selected post mining use of the land, which is planned to occur after the cessation of mining operations.

'landform' – means the elevation, slope and aspect of the **land** that make up the surface of the earth.

'limit of disturbance' for an Enterprise Mine lease, means the area shown as the limit of disturbance for the lease on the **restricted mine path map.**

'litter' means the uppermost layer of organic material in a soil, consisting of freshly fallen or slightly decomposed organic materials such as leaves, twigs and sticks, which have accumulated on the ground surface.

'm' means metres.

'measures' includes any measures to prevent or minimise environmental impacts of the mining activity such as bunds, silt fences, diversion drains, capping, and containment systems.

'mine path' means the total area of disturbance as a result of the **mining activity** nominated in the **plan of operations** as stripped and/or cleared area.

'mine site' means, where relevant, each of the following:

ML1159, ML1164, ML 1121	North Stradbroke Island – Gordon Mine (20km south of Dunwich)
ML1109, ML1122	North Stradbroke Island – Yarraman Mine (2km south west of Point Lookout)
ML1117, ML1121, ML1174, ML1175	North Stradbroke Island – Ibis Mine (3km south east

	of Dunwich)
ML1105, ML1113, ML1117, ML1119, ML1120, ML1130, ML1153, ML1162, ML1163	North Stradbroke Island – Enterprise Mine (5km south east of Dunwich)
ML 1140, ML1117, ML1105, ML1119, ML1153, ML1162, ML1163	North Stradbroke Island – Bayside Mine (Approx. 2km south of Dunwich)
ML1112, ML1160, ML1172	North Stradbroke Island – Amity (1.5km south east of Amity)
ML1103, ML1118	North Stradbroke Island – Dunwich

'mining activity' means that specified in the *Environmental Protection Act 1994.*

'mining block' means an area of the **mine path** or pit that is represented by a line perpendicular to the centreline of the **mine path** or pit, measured at 100 metre (m) intervals along the centreline. Where a dredge path or dry mining pit intersect, the dry mining pit is considered to be part of the dredge path.

'mining operations' means, for the purposes of this **environmental authority**, clearing, topsoil stripping, dredging or otherwise extracting, **infrastructure** development (includes but is not limited to roads, intrusive exploration activities, water and electricity transmission, stockpiles), **tailings** placement etc, but excludes measures taken solely to control **environmental impact(s)** or limit **risk**, monitoring, **rehabilitation** and gaining access to areas for these purposes.

'NATA' means National Association of Testing Authorities, Australia

'native' means that provided in the **Queensland Herbarium Mapping Methodology.**

'native bushland' means vegetation originating naturally on North Stradbroke Island.

'nominated species' means *Allocasuarina torulosa, Angophora leiocarpa, Banksia spp., Callitris spp., Corymbia spp., Eucalyptus spp.,* and *Lophostemon confertus.*

'plan of operations' means that specified in the *Environmental Protection Act 1994.*

'post-mining activity' means after **mining operations** have been completed.

'post- 30 June 1987' means revegetation undertaken after 30 June 1987.

'post- 1 January 2007' means the construction of **landform** undertaken on or after 1 January 2007.

'pre-mining activity' means prior to **mining operations** commencing.

'pre-mining topography' means the topography as encountered by the **post-1 January 2007, mining activity** at the time of that mining.

'pre-30 June 1987' means revegetation undertaken on or before 30 June 1987.

'pre-1 January 2007' means the construction of **landform** undertaken before 1 January 2007.

'protected area' means – a protected area under the *Nature Conservation Act 1992*; or

(a) a marine park under the *Marine Parks Act 1992*; or

(b) a World Heritage Area.

'protective foliage cover (pfc)' means that provided in the **Queensland Herbarium Mapping Methodology.**

'Queensland Herbarium Mapping Methodology' means Neldner, V.J., Wilson, B.A, Thompson, E.J. and Dillewaard, H.A. (2005) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland,* Version 3.1 updated September 2005, Queensland Herbarium, Environmental Protection Agency, Brisbane pp.128 or revisions of this document and methodology as they become available.

'Registered Professional Engineer of Queensland (RPEQ)' means a professional engineer registered under the Queensland *Professional Engineers Act 2002.*

'**rehabilitation**' means the process of reshaping and revegetating **land** to restore it to a stable **landform** and in accordance with the **acceptance criteria** set out in this **environmental authority** and, where relevant, includes remediation of contaminated land.

'relevant water quality parameters' means pH, conductivity, turbidity or suspended solids, aluminium, iron, zinc and silicon.

'**representative**' means a sample set which covers the variance in monitoring or other data either due to natural changes or operational phases of the **mining activity**.

'representative unmined areas' means, at each **mine site**, two (2) or more representative control plots that are established in typical areas of similar chemical and physical characteristics, as nominated by the **holder of this environmental authority. Rehabilitation** must be compared with those **representative unmined areas** that most typically reflect erosion within the **authorised mining tenement(s).**

'representative unmined plots' means, at each **mine site**, two (2) or more representative control plots that are established in typical areas of each **pre-mining activity vegetation community ,** as nominated by the **holder of this environmental authority. Rehabilitation** must be compared with those **representative unmined plots** that most typically reflect the **pre-mining activity vegetation community** that the **holder of this environmental authority** is seeking to redevelop in the **rehabilitation.**

'restricted mine path', for an **Enterprise Mine lease**, means the area comprising the **dredge path** and the **dry mining area** for the lease

'restricted mine path map' means the map titled 'NSI 3' approved by the chief executive on 18 November 2015 and included as Appendix A of this environmental authority.

'risk' means the change of something happening that will have an impact on objectives.

'risk management' means the culture, processes and structures that are directed towards realizing potential opportunities whilst managing adverse effects.

'risk treatment' means the process of selection and implementation of measures to modify **risk**.

'sensitive place' means;

- a **dwelling**, residential allotment, mobile home or caravan park, residential marina or other residential
- premises; or
- a motel, hotel or hostel; or
- an educational institution; or
- a medical centre or hospital; or
- a public park or gardens (excluding a **protected area** under the *Nature Conservation Act 1992*, the

- *Marine Parks Act 1992* or a World Heritage Area); or
- a place used as a workplace, an office or for business or commercial purposes which is not part of the
- **mining activity** and does not include employees accommodation or public roads.

'stakeholders' means an individual or group concerned with or affected by the environmental performance of the **holder of this environmental authority.**

'statistically significant(ly)' means when the difference between groups of data is sufficient for a statistical test to reject the *null hypothesis* (i.e. where the data has been analysed using a valid statistical analysis tool and there is a 95% probability that the conclusions are correct).

'tailings' means the sand and slimes generated from the **mining activity**.

'terrain element(s)' means a discreet area containing a specific range of elevation, slope and aspect values delineated at a mapping scale of 1:10,000. The terrain elements and their values are specified in the table below:

Terrain Element	Elevation (m)		East Aspect (degrees)		North Aspect (degrees)		Slope (degrees)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
1	48.5	14.0	130.1	35.1	50.9	24.7	3.4	2.4
2	2.4	2.1	116.8	54.3	97.5	48.4	0.6	0.9
3	59.3	8.4	73.0	45.4	135.2	31.1	3.5	2.3
4	75.3	12.5	164.3	22.9	90.3	19.2	8.8	3.9
5	39.9	9.5	156.7	29.3	101.2	26.2	5.6	3.7
6	93.5	8.5	23.9	34.2	73.6	26.6	4.1	2.2
7	65.9	10.6	56.2	28.2	139.7	33.1	11.3	4.7
8	161.3	17.8	147.6	32.2	107.3	30.3	9.2	4.8
9	83.7	10.5	126.6	33.6	46.9	25.9	4.8	2.5
10	33.9	7.1	43.2	38.3	112.7	40.0	3.4	2.5
11	37.6	11.1	25.0	17.3	111.4	19.9	12.8	4.3
12	11153	16.6	71.1	41.9	138.3	26.1	5.6	3.1
13	2.9	2.5	36.5	33.3	75.6	37.3	0.7	1.2
14	76.8	15.7	69.1	29.7	32.1	18.7	17.2	4.3
15	92.0	16.1	137.5	22.8	51.4	18.4	14.6	4.3
16	36.0	23.0	42.4	13.7	132.5	13.2	29.6	6.2
17	119.1	10.1	66.5	34.0	38.1	23.8	7.4	4.2

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18	92.1	15.5	120.6	28.0	144.0	20.5	14.7	4.6
19	101.5	7.2	148.3	31.1	71.5	27.4	4.9	2.6
20	123.5	10.6	164.1	17.4	94.3	20.3	9.8	3.2
21	38.5	10.9	135.5	21.5	133.7	20.9	10.1	3.8
22	130.7	23.2	17.7	16.7	85.6	22.1	17.4	4.3
23	48.0	10.0	145.9	22.1	57.9	20.0	15.4	4.3
24	91.7	12.6	43.1	23.5	51.2	19.2	10.8	3.4
25	57.6	9.8	168.3	12.3	95.5	15.2	19.4	4.6
26	47.5	21.8	156.8	14.6	71.7	20.8	28.2	4.8
27	25.4	7.9	53.0	67.2	24.1	32.6	6.4	9.5
28	142.9	11.1	61.5	65.5	92.7	27.3	5.4	3.1
29	106.4	11.2	17.7	20.3	90.1	20.7	10.7	3.6
30	140.5	9.4	135.9	27.5	51.6	21.9	5.7	2.8
31	38.2	10.4	66.9	24.6	150.7	19.0	11.9	5.9
32	26.7	10.1	169.4	12.1	87.5	14.5	16.4	5.3
33	66.9	8.0	31.6	34.1	73.1	26.9	5.2	3.3
34	42.4	11.2	53.0	29.0	45.1	21.9	8.5	4.5
35	59.9	18.8	44.5	19.9	48.1	18.5	26.1	5.3
36	22.4	12.9	85.9	28.7	25.3	15.8	18.5	7.1
37	100.5	16.6	167.2	14.2	94.2	17.3	18.7	4.9
38	4.2	4.3	48.1	24.4	132.8	26.0	2.7	3.2
39	89.6	8.8	103.2	70.4	143.3	27.2	5.2	3.1
40	109.8	13.2	39.4	23.1	127.5	22.1	21.0	5.1
41	147.8	18.2	107.3	38.8	142.5	21.0	14.0	4.6
42	51.5	9.4	13.3	177.4	88.5	17.2	12.2	4.8
43	7.1	6.2	128.8	27.8	45.3	24.9	3.3	3.3
44	23.4	10.1	130.6	27.1	135.3	23.6	9.5	5.8
45	78.3	9.6	15.3	15.3	96.1	18.9	16.3	5.0

46	13.0	7.4	29.3	33.3	84.2	30.1	5.9	4.1
47	45.8	22.4	25.4	16.2	68.1	18.8	23.1	4.9
48	160.1	15.5	52.0	38.7	56.6	30.4	7.9	3.9

'the Act' means the *Environmental Protection Act 1994*.

'trees' means the definition of predominant stratum (or layer) provided in the **Queensland Herbarium Mapping Methodology.**

'trigger level(s)' means the level of change in an **environmental value(s)** that initiates a **risk management** response to prevent **environmental harm**.

'understorey' means that provided in the **Queensland Herbarium Mapping Methodology.**

'µS/cm' means micro-Siemens per centimetre.

'vegetation community' means that provided in the **Queensland Herbarium Mapping Methodology.**

'volume difference index (VDI)' is expressed by the following formula:

VDI = (Tv – Mv) / AMB

Where

VDI = Volume Difference Index

Mv = Volume of material mined from a **mining block** (m3 in situ)

Tv = Volume of **tailings** from another **mining block** used to fill the same **mining block** referred to in Mv after it was mined (m3 as placed)

AMB = Area of the **mining block** referred to in Mv (m2)

'waste' means that specified in the *Environmental Protection Act 1994.*

'water quality' means the chemical, physical and biological condition of water.

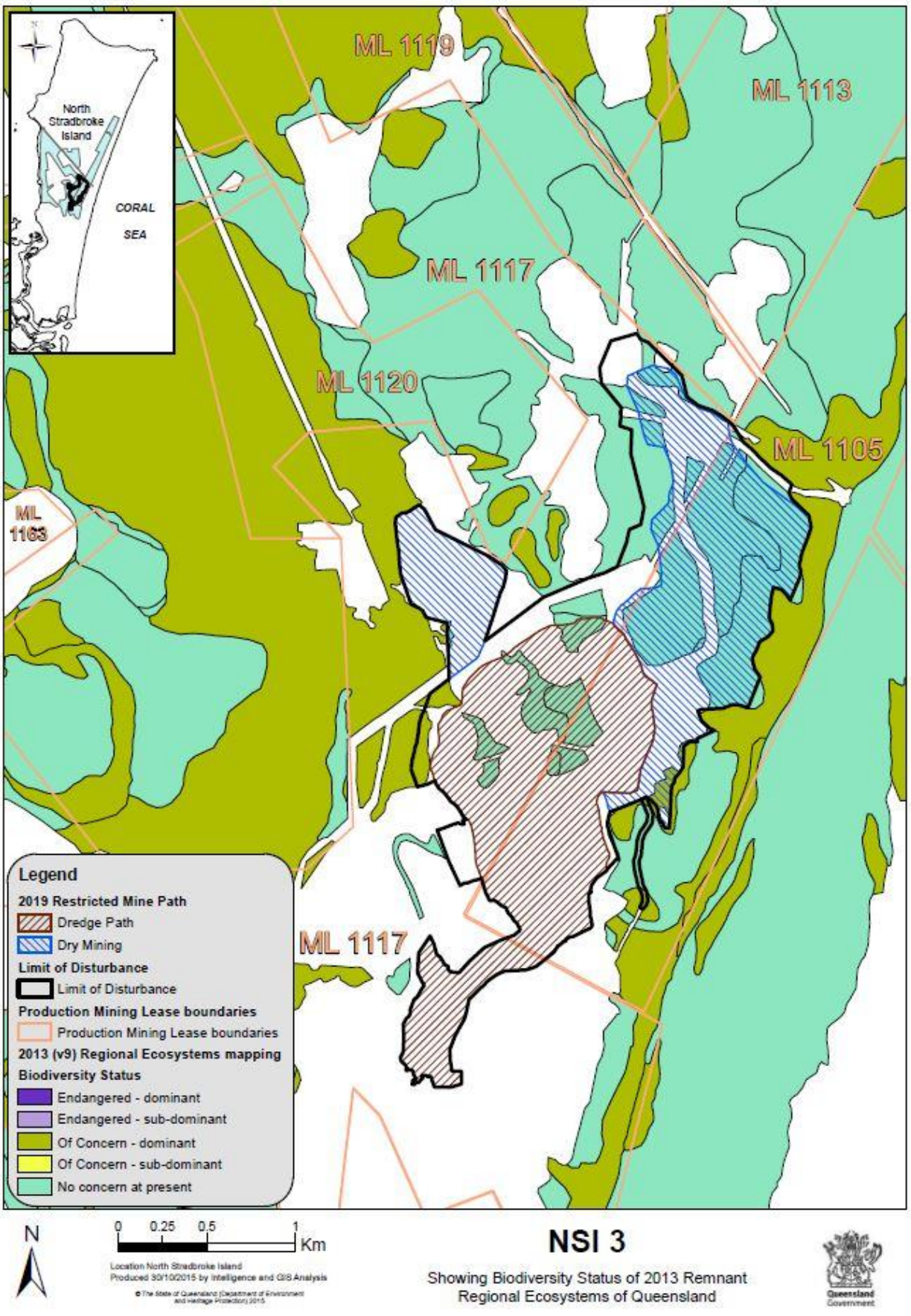
'watercourse' has the same meaning given in the *Water Act 2000*.

'**waters**' includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, bed and bank of any waters, dams, non-tidal or tidal waters (including the sea), groundwater or any part-thereof.

'zone of impact' means those areas, whether on or off the **authorised mining tenement(s)**, where the **mining activity** could or do result in a change in the **environment**. Also refer to the definition for **environmental impact(s).**

Appendices

Appendix A Restricted Mine Path Map "NSI 3"


ML 1119
ML 1113
ML 1117
ML 1120
ML 1105
ML 1163
ML 1117
North Stradbroke Island
CORAL SEA
Legend
2019 Restricted Mine Path
Dredge Path
Dry Mining
Limit of Disturbance
Limit of Disturbance
Production Mining Lease boundaries
Production Mining Lease boundaries
2013 (v9) Regional Ecosystems mapping
Biodiversity Status
Endangered - dominant
Endangered - sub-dominant
Of Concern - dominant
Of Concern - sub-dominant
No concern at present
N
0 0.25 0.5 1 Km
Location North Stradbroke Island
Produced 30/10/2015 by Intelligence and GIS Analysis
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NSI 3
Showing Biodiversity Status of 2013 Remnant Regional Ecosystems of Queensland
Queensland Government

END OF ENVIRONMENTAL AUTHORITY