

Assessment Application Report:

Rio Tinto Exploration: proposed works within Significant Environmental Area of Billy's Lagoon Plateau, Cape York Peninsula

Ecological Report

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<i>Title</i>	Assessment Application Report: Rio Tinto Exploration: proposed works within Significant Environmental Area of Billy's Lagoon Plateau, Cape York Peninsula
<i>Project</i>	2021-1015 RTX-Elyse Projects
<i>Reference No.</i>	2021-1015 Rep01
<i>Date</i>	27 January 2022
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Abbreviations

AOI	Area of interest
DOGIT	Deed of Grant in Trust
EA	Environmental Authority
EVNT	Endangered, Vulnerable and Near Threatened species
HES	High Ecological Significance wetlands
MSES	Matters of State Environmental Significance
MNES	Matters of National Environmental Significance
RE	Regional Ecosystem
RIDA	Regional Interests Development Approval
RTX	Rio Tinto Exploration
SEA	Strategic Environmental Area



1. Introduction

1.1 Project Overview

Rio Tinto Exploration (RTX) Pty Ltd proposes to undertake exploration drilling for bauxite on EPM26573 and EPM26076 as part of the Elyse Project. The intended exploration area is located approximately 26 km from Rio Tinto Pty Ltd held mining lease ML 7031 and approximately 15 km from ML 7024 (**Figure 1**).

The applicant currently holds existing Environmental Authorities (EA000839 and EPSX03606215) and is seeking a Regional Interests Development Approval (RIDA) for mineral exploration proposed within the Cape York Strategic Environmental Area (SEA).

RTX commissioned Ecotone Flora Fauna Consultants to assess the environmental attributes of the tenement areas and prepare this assessment report to support an assessment application. This assessment report has been prepared in accordance with the RPI Act Statutory Guidelines 01/14 (DSDMIP, 2019) and 05/14 (Queensland Treasury, 2020): Environmental attributes were assessed against the Cape York Regional Plan criteria outlined for the Cape York SEA. Government reports were generated for the target area for Matters of State Environmental Significance (MSES) and Matters of National Environmental Significance (MNES). Habitat requirements and location records of threatened species were sourced from various online databases including Atlas of Living Australia (ALA), Australasian Virtual Herbarium (AVH) and Species Profile and Threats database (SPRAT; Department of Agriculture, Water and the Environment, 2021).

1.2 The Applicant

The applicant is Rio Tinto Exploration Pty Limited.

1.3 Landholder and Tenure details

Exploration Permit EPM26573 was granted on 27 September 2019 over an area of 22 sub-blocks within blocks MITC410 and MITC411, under environmental authority EA000839, due to expire 26 September 2024. EPM26076 was granted on 20 July 2017 covering an area of 98 sub-blocks across 11 blocks, with environmental authority EPSX03606215, due to expire on 19 July 2022. The two tenements cover approximately 40 000 ha, with the area of interest (AOI) occurring predominantly within EMP26076 and covering approximately 2 000 ha (**Figure 1**).

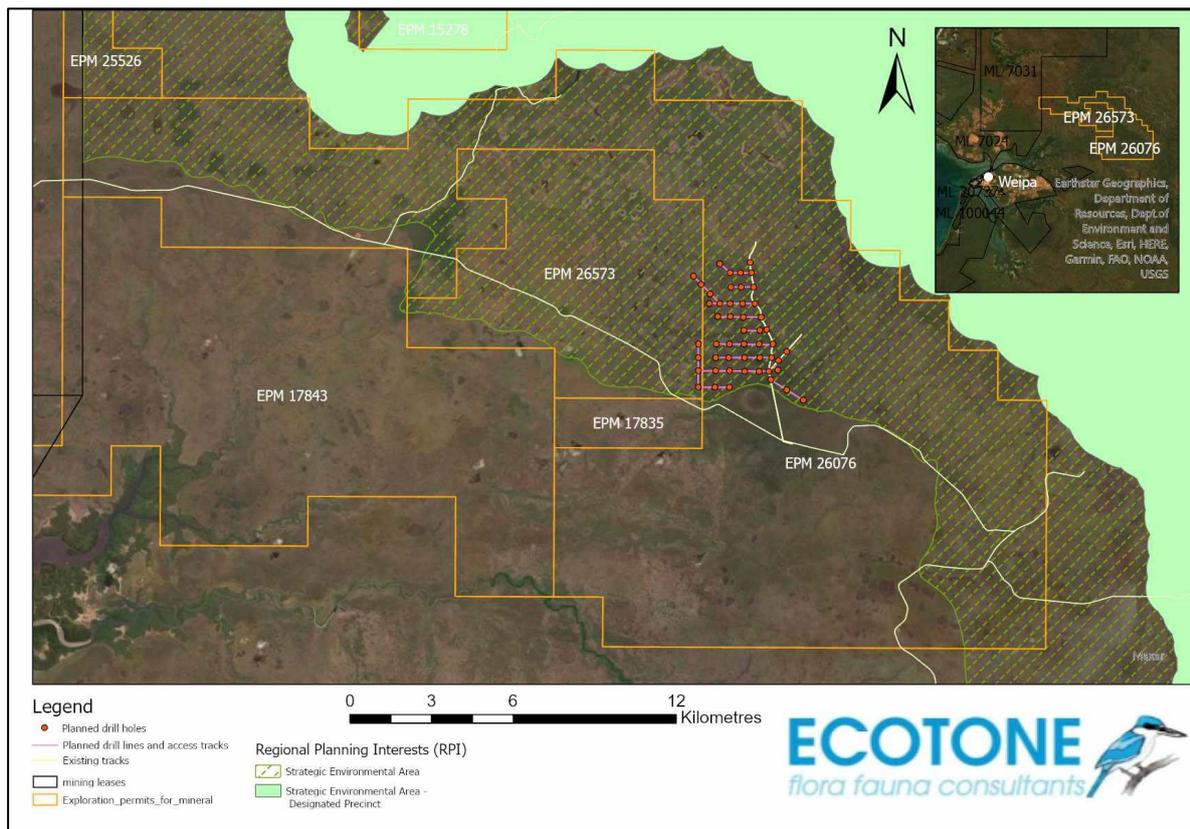
The underlying land is held by the Napranum Council as DOGIT (Deed of Grant in Trust). The relevant Native Title party is Northern Cape York #2 – Mokwiri Aboriginal Corporation RNTBC (Determined Native Title), QC2014/011 (National Native Title Tribunal Number), QUD156/2011 (Federal Court Number). The primary existing land use in the area comprises production from the cattle station at Billy's Lagoon (Napranum Aboriginal Shire Council, 2020).



2. Proposed Exploration Activities

2.1 Preliminary Assessment

A preliminary reconnaissance of the area may be undertaken to assess whether the proposed drilling is warranted in all areas. This work would entail walking the area of interest (AOI), utilising a hand auger (4" diameter) to penetrate topsoil and determine if there is bauxite below the surface. Where possible, a soft tyred 4WD vehicle will be driven through open woodland forest to reach the AOI.



2.2 Drilling Program

Following the initial reconnaissance, exploration drilling will be undertaken using conventional air core methods, utilising a small drill rig mounted on a 6-wheel Toyota Landcruiser with soft, pneumatic tyres. Air core drilling utilises compressed air, without the addition of water, to penetrate the overburden and bauxite-laterite profile. No drill pads or sumps are required, with drilling to occur on exploration tracks or existing unsealed tracks.

Exploration drilling will occur at between 400 and 500 m spacing. A maximum of 50 holes will be drilled at a depth of between four to eight metres depth (**Table 1**). The specific hole locations may be adjusted in response to geology, environmental considerations, access logistics and/or cultural heritage related reasons. It is expected that fewer holes will be excavated if the quality of bauxite is of low grade. Holes take approximately 30 minutes to drill and are backfilled at completion of each drill hole.

**Table 1** Summary of proposed exploration activities and surface disturbance

Activity	length (km)	Width (km)	Area of impact (ha)
Access tracks/ drill lines	20	0.004	8
	Spacing (m)	Number	Area of impact (ha)
Drill holes (at 0.3 m round)	400 - 500	50	0.00045

Other light vehicles (soft tyred 4WD) will be utilised for geologists, field hands and other project support personnel (e.g. environment surveyors and traditional owners) within the AOI.

2.3 Access Roads and Tracks

An existing network of tracks provides access to both tenements and will be utilised where possible. New exploration tracks will need to be constructed for exploration and air core drilling. Tracks are proposed to be cleared with a small dozer (e.g. Caterpillar D6) to a width of approximately three to four metres. A minimum disturbance approach will be taken, with the blade of the dozer lifted clear of the ground to ensure root stock is preserved and large trees are navigated around where possible. Approximately 12 tracks, equalling 20 linear km of track are proposed to be soft cleared. These tracks are not intended for use during wet-weather conditions, particularly during the wet-season, and thus will not be constructed for flood immunity. Tracks are constructed such that passage of water during the wet season will be consistent with existing hydrology. Maintenance of some of the existing or proposed tracks may be required over time but will be restored at the end-of-life in accordance with the relevant EA conditions. The existing and proposed tracks are shown in **Figure 1**.

All ground disturbance activities will avoid known significant environmental sites as identified in the Matters of State Environmental Significance (MSES) reports (Department of Environment and Science, 2022b), such as "Of concern" regional ecosystems.

2.4 Campsite and other facilities

No camp is required for the exploration activities. Personnel will be accommodated in Weipa and commute to and from the Project Area each day by 4WD. All rubbish generated will be removed from the Project Area and disposed of at a licenced facility in Weipa.

No laydown area or other temporary facilities are to be constructed during the exploratory drilling project. All required equipment will be carted and stored upon the vehicles.

2.5 Water Supply

Air core drilling is a water free process. No water will be extracted from groundwater bores or surface waters within the tenements. Drinking water will be carted on vehicles each day from Weipa.

2.6 Timing

Exploration will only be undertaken during the dry season (April to November). The planned duration for the exploratory work is less than one month, operating only during daylight hours.



3. Environmental Attributes

The environmental attributes associated with the Cape York SEA are outlined in Schedule 1 of the Cape York Regional Plan (DSDMIP, 2019) and are prescribed as follows:

- The natural hydrologic processes of the area characterised by:
 - Natural, unrestricted flows in and along watercourses and estuaries
 - Overflow from watercourses onto flood plains of the area, or the other way
 - Natural flow paths of water across flood plains connecting waterholes, lakes and wetlands in the area
- The natural geomorphic processes of the area characterised by:
 - Natural erosion
 - The transport and deposit of sediment by water throughout the catchments and along the watercourse systems and estuaries
- The functioning riparian processes of the area characterised by native riparian vegetation associated with watercourses, estuaries, lakes, flood plains and wetlands.
- The natural wildlife corridors of the area characterised by:
 - Natural habitat in the watercourse systems
 - Permanent waterholes and springs
- The natural water quality in the watercourse channels and aquifers and on the flood plains in the area characterised by physical, chemical and biological attributes that support and maintain natural aquatic and terrestrial ecosystems.

3.1 Climate

The area of interest within the Cape York Peninsula SEA is located approximately 45 km to the north-east of the township of Weipa. The region is characterised by a monsoonal climate with distinct wet (November to April) and dry seasons (May to October). Mean annual rainfall recorded at the closest weather station (Weipa Aero station number 027045) is 1911 mm, with only 11 mm falling on average between June and September (**Figure 2**). Daily average temperatures range from 19°C – 31.1°C in July and 23.5°C – 35.8 °C in November (BOM, 2020).

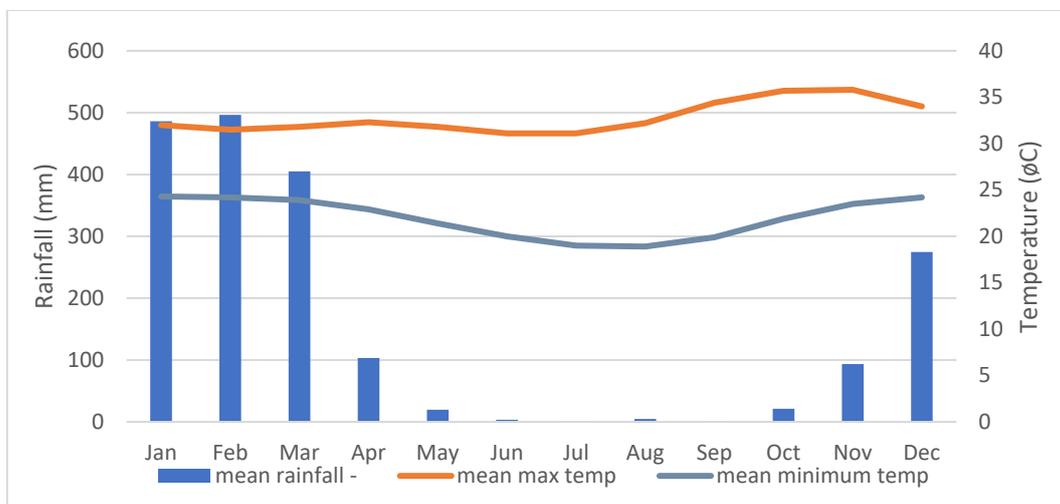


Figure 2 Rainfall and temperature averages for the Weipa region



3.2 Hydrology

EPM26573 and EPM26076 are located within both the Wenlock and Embley drainage basins, with the intended exploration area occurring within the Wenlock drainage basin (Queensland Government, 2022). The Wenlock drainage basin covers 7 555.2 km² terminating near the community of Mapoon into Port Musgrave (Department of Environment and Science Queensland, 2013). Elevations across the tenements range from approximately 60 m above sea level to less than 10 m at the Wenlock River.

The landscape within the tenements comprises gently undulating hills, with seasonal, shallow, branching drainage lines (**Figure 3**). During the wet season the water drains into the deeply incised Wenlock River channel or is captured in circular depressions (melon holes), which are common throughout the area (Eggleton et al., 2008). Permanent springs occur within the Wenlock drainage basin on slopes fed by the bauxite aquifer along the margins of the bauxite plateau, Regional Ecosystem 3.10.1d (Leblanc et al., 2015) but are not known from within the proposed exploratory area.

3.3 Geomorphology

The AOI is located within the Weipa Plateau subregion of the Cape York Peninsula (CYP) Bioregion. This subregion covers approximately 28 500 km² and is characterised by weathered rocks of the Rolling Downs Group, often overlaid by the more permeable Bulimba Formation, allowing permanent aquifers to form below the bauxite separate to the Great Artesian Basin (Eggleton et al., 2008). Soils of the Weipa Plateau are predominantly red and yellow Kandosols overlying the bauxite. Minor Hydrosols (wet or seasonally inundated soil) are present due to the undulating topography of the plateau and the resulting variation in the soil moisture processes (Eggleton et al., 2008). Most creeks and rivers incised into the Weipa Plateau are fringed by grey Kandosol terraces while the floodplains are generally alluvial soils (Rudosols). Based on the Regional Ecosystem framework of the Queensland Government (Wilson & Taylor, 2012), Land Zones present within the AOI comprise:

- Land Zone 5 - Tertiary-early Quaternary loamy and sandy plains and plateaus
- Land Zone 9 - undulating country on fine grained sedimentary rocks

Additionally, within the wider area occurs:

- Land Zone 3 - recent Quaternary alluvial systems; alluvial river and creek flats
- Land Zone 7 - Cainozoic duricrusts, ironstone jump-ups

3.4 Vegetation Communities

The environmental Regional Ecosystem (RE) reports generated for EPM26573 and EPM26076 (Department of Environment and Science, 2022a) indicate that approximately 20 RE's are present within EPM26573 and EPM26076 (**Table 2**), with five RE's present within the AOI (shaded in yellow in **Table 2**). Many of the mapped vegetation types represent heterogeneous vegetated patches representing multiple RE's, with an estimated proportion of each regional ecosystem supplied within the Department of Environment reports.

EPM26573 and EPM26076 cover approximately 40 000 ha with the total area of interest comprising approximately 2 000 ha. The majority of the vegetation types have a biodiversity status of "No concern at present" (97.7% of area). There are no "Endangered" regional ecosystems present. Two "Of concern" regional ecosystems are present and comprise 2.3% of the total exploration tenements area.



Within the specific AOI focus of this exploration application, approximately 1 500 ha comprises a 50/50 division of RE 3.5.36a and 3.5.39, approximately 400 ha is listed as 40/40/10/10 division of REs 3.5.39/3.9.4a/3.9.5/3.5.41 and 100 ha contains a 50/50 split of RE 3.5.39 and 3.9.4a (**Figure 3** – inset map). Over 99% of the intended exploration area is listed of no concern at present. The “Of concern” RE present within the AOI, RE3.9.5 (*Corymbia papuana* open woodland on rolling plains), is a woodland type distinct from the more typical Darwin Stringybark (*Eucalyptus tetradonta*) dominated woodlands of the bauxite plateau.



Table 2 Regional Ecosystems (RE) present within EMP26573 and EMP26076 with brief description of vegetation and special values associated with RE. Yellow shaded boxes are RE's present within the area of interest for the current exploration application.

RE	Vegetation Management Act class	Short Description	Special Values	Area(ha)	% of target EMPs
3.3.10	Least Concern	Melaleuca fluviatilis and/or Melaleuca argentea woodland or M. saligna or M. dealbata woodland fringing watercourses	Important corridors for wildlife. The near threatened grass species Lepturus xerophilus has been recorded in this ecosystem.	127.97	0.32
3.3.20	Least Concern	Corymbia clarksoniana or C. novoguineensis woodland on alluvial plains	Potential habitat for NCA listed species: Astonia australiensis, Dendrobium johannis, Globba marantina, Stylium longissimum	1386.09	3.46
3.3.24	Least Concern	Eucalyptus leptophleba +/- Erythrophleum chlorostachys woodland on riverine levees and alluvial plains		72.48	0.18
3.3.31a	Least Concern	Eucalyptus tetradonta woodland +/- Corymbia clarksoniana +/- Erythrophleum chlorostachys, occurs on alluvial plains on the coastal lowlands.		158.83	0.40
3.3.39	Of Concern	Semi-deciduous microphyll vine forest +/- Melaleuca spp. associated with closed depressions	Potential habitat for NCA listed species: Fimbristylis adjuncta	107.97	0.27
3.3.49	Least Concern	Melaleuca viridiflora +/- Corymbia clarksoniana low open woodland on floodplains and alluvial plains	Potential habitat for NCA listed species: Astonia australiensis, Dendrobium bigibbum, Dendrobium johannis, Fimbristylis adjuncta, Habenaria fuscina, Habenaria xanthantha, Hibbertia cymosa, Homoranthus tropicus, Hoya revoluta, Pluchea tenuis, Stemon angusta, Stylium longissimum	2683.38	6.69
3.3.50	Least Concern	Melaleuca spp. woodland on swamps on floodplains and non-floodplain landforms	Potential habitat for NCA listed species: Homoranthus tropicus	1506.13	3.76
3.3.50d	Least Concern	Melaleuca saligna woodland to open woodland +/- Corymbia clarksoniana. The very sparse subcanopy and/or shrub layer often contains Asteromyrtus symphyocarpa +/- Calycopeplus casuarinoides +/- M. viridiflora. The very sparse to sparse ground layer can contain a range of grass and sedge species. Occurs in swamps on non-floodplain landforms	Potential habitat for NCA listed species: Homoranthus tropicus	17.73	0.04
3.3.53	Least Concern	Neofabricia myrtifolia +/- Melaleuca viridiflora low woodland on streams and alluvial plains	The near threatened species Xanthostemon arenarius occurs in this ecosystem.	246.32	0.61
3.3.5a	Least Concern	Evergreen to semi-deciduous notophyll vine forest. This regional ecosystem varies in structure and floristic composition depending on the position relative to the stream channel, the substrate and the permanence of water flow. It reaches its best development on the banks of the Wenlock River.	High numbers of endemic plant species. The vulnerable plant species Gardenia psidioides, and near threatened species Donella lanceolata, Croton brachypus and Litsea macrophylla occur in this ecosystem. Important wildlife corridor for closed forest species.	0.65	0.00
3.3.64	Least Concern	Baloskion tetraphyllum subsp. meiotachyum and/or Leptocarpus spp. and/or Dapsilanthus spathaceus open sedgeland in drainage swamps	High diversity of sedges.	70.02	0.17
3.3.9	Least Concern	Lophostemon suaveolens woodlands on creeklines and swamps		373.1	0.93
3.5.36	Least Concern	Eucalyptus tetradonta and Corymbia nesophila woodland to open forest on undulating plains and remnant plateaus	Potential habitat for NCA listed species: Acacia ommatosperma, Argophyllum verae, Cycas semota, Fimbristylis adjuncta, Habenaria rumphii, Hedyotis novoguineensis, Lepturus geminatus, Samadera sp. (Kennedy River J.R.Clarkson 5645), Stemon angusta, Sticherus milnei, Stylium longissimum	10413.48	25.98



RE	Vegetation Management Act class	Short Description	Special Values	Area(ha)	% of target EMPs
3.5.39	Least Concern	Eucalyptus tetradonta +/- Corymbia clarksoniana woodland on sand plains	Potential habitat for NCA listed species: Acacia armitii, Dendrobium johannis, Habenaria rumphii, Jemsa multicaulis, Samadera sp. (Kennedy River J.R.Clarkson 5645), Stemonia angusta 3.5.39x1: High diversity of plant species due to seepage from higher in landscape.	12275.55	30.62
3.5.4	Least Concern	Semi-deciduous notophyll vine forest in small patches on northern plateaus	Habitat for the near threatened species Senegalia albizioides and Margaritaria indica.	736.37	1.84
3.5.41	Least Concern	Melaleuca viridiflora +/- Corymbia clarksoniana woodland to low open woodland on plains	Potential habitat for NCA listed species: Acacia ommatosperma, Calophyllum bicolor, Dendrobium johannis	2473.6	6.17
3.7.3	Least Concern	Eucalyptus cullenii +/- E. tetradonta woodland on erosional escarpments and plains	Habitat for the near threatened species Acacia ommatosperma.	1043.35	2.60
3.9.4a	Least Concern	Eucalyptus leptophleba +/- Corymbia dallachiana or Eucalyptus platyphylla open woodland on rolling plains	Potential habitat for NCA listed species: Acacia ommatosperma, Arthraxon australiensis	5570.77	13.90
3.9.5	Of Concern	Corymbia papuana open woodland on rolling plains		817.33	2.04

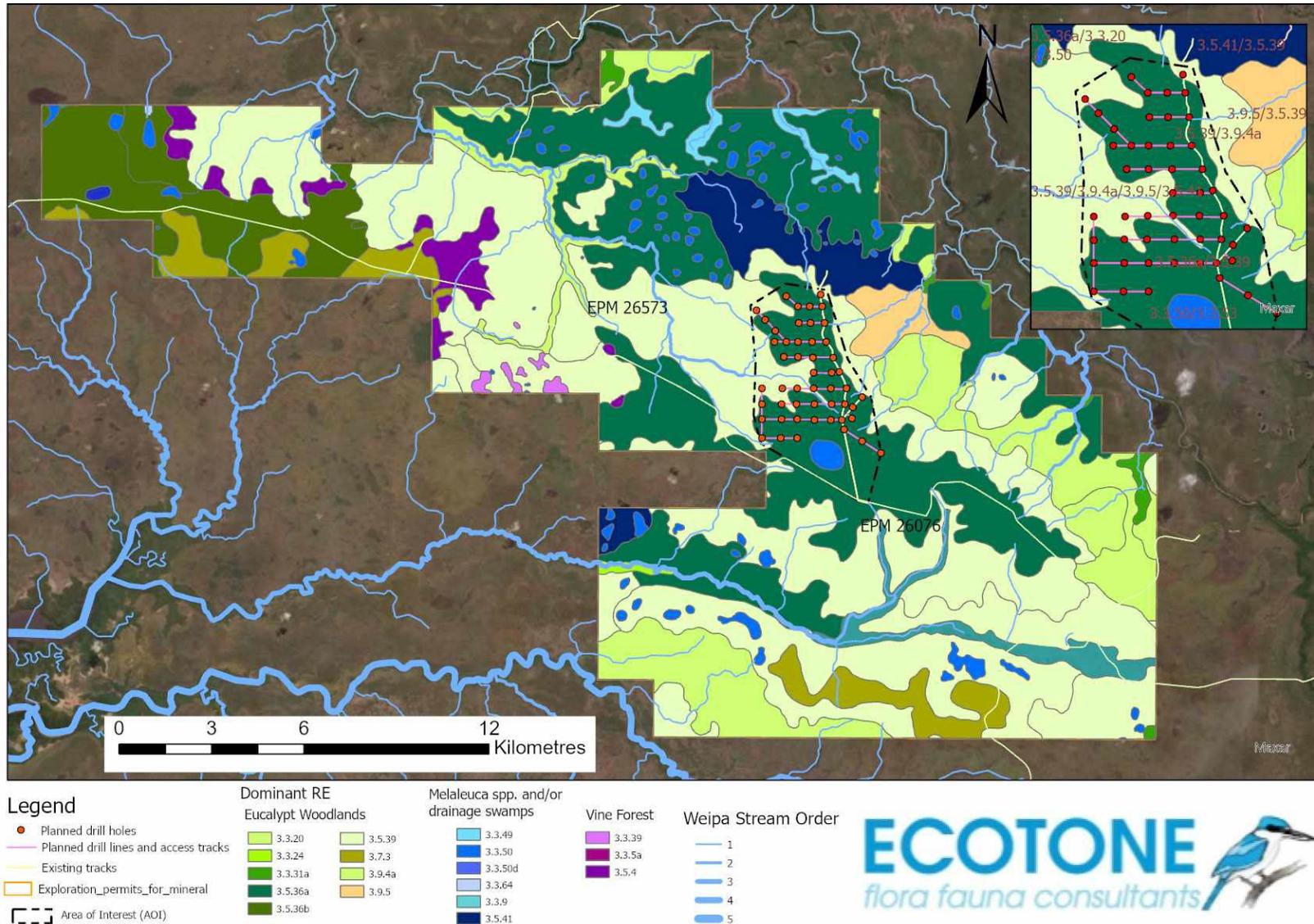


Figure 3 Regional Ecosystems and drainage within EPM26573 and EPM26076. Inset map indicates RE's specific to the area of interest



4. Potential Impact on Environmental Attributes

The exploration activity has been planned to not result in any widespread or irreversible impact on the environmental attributes of the Cape York Strategic Environmental Area as detailed in the following sections:

4.1 Hydrologic Processes

Exploration activities will be conducted during the dry season (between April and November) to avoid periods of high rainfall and the subsequent overland flow of water across the landscape. It is expected that most seasonally inundated creeks, such as the first order streams indicated in the inset map of **Figure 3**, will be dry during the period of exploration program.

Rio Tinto Weipa currently employ an environmental buffer system, such that clearing occurs at a minimum of 200 m from any sensitive vegetation. Any riverine or non-riverine wetlands in the area are protected as sensitive vegetation within the buffer system, reducing the potential for anthropogenic alteration to the waterflow within the area. Pre-disturbance environmental surveys will ensure that sensitive vegetation types are buffered by 200 m from exploration activities.

Existing tracks will be used where possible; however, new exploratory tracks will need to be established for exploration and air core drilling. Tracks will be established using a minimal disturbance approach (soft clear) to retain existing ground surface levels, reduce damage to the soil surface and ground vegetation, and retain root stock. These measures will ensure that the tracks are able to naturally rehabilitate from the retained soil seed bank and root stock. Natural surface water flow patterns of the area and stream flow and connectivity will not be substantially affected by the works. The minimal disturbance intent of the exploration process is to ensure that connectivity of the stream flow within any watercourse and laterally across the landscape will be maintained following the activity.

The exploration activities target the bauxite section of the laterite profile on elevated lateritic plateaus. As such, it is unlikely the drilling activities will intersect shallow aquifers in the area. Drill holes will be infilled immediately following drilling, using the drilled sample and plugged as required, to ensure that local topology remains intact following exploration.

4.2 Geomorphic Processes

Movement of water across the landscape during the wet season can be quite substantial with localised intense rainfall events exceeding 50 mm within a few hours. Adverse erosion and sedimentation can result from the waterflow when tracks and drill lines are cleared of trees, saplings and ground cover and the ground surface is disturbed.

The exploratory activity is a temporary process, undertaken during the dry season with minimal disturbance to the ground surface. Exploratory tracks are pushed with the dozer blade raised above the surface, reducing damage to ground cover and topsoil. Rootstock from saplings, shrubs and trees are retained and large trees (>250 mm diameter at breast height) are avoided during the minimal disturbance approach. Minimal disturbance and retention of the ground layer (particularly grasses) help facilitate a reduction in erosion potential of tracks during the following wet season. Observations of nearby areas where this approach has been previously utilised reveals substantial short-term recovery of natural vegetation when viewed a year later.



Additional management practices such as strategic flow dissipation and drainage works along the new exploration tracks will also be applied where necessary to assist in dispersing water across the landscape rather than concentrating flows that may lead to erosion and sedimentation issues along tracks.

4.3 Riparian Processes

Implementation of the proposed environmental buffer would include buffers around riparian corridors. No exploration or other activities leading to the disturbance of vegetation would be conducted within these environmental buffers. Consequently, it is not expected that the proposed exploration activities would have widespread or irreversible impacts on riparian function in the SEA and wider tenement area. Targeted verification of riparian corridor boundaries may be required to ensure environmental buffers are correctly located. This activity would be undertaken during pre-clearing environmental surveys prior to the commencement of track establishment and drilling.

4.4 Wildlife Corridors

There are no MSES designated wildlife corridors within the exploration tenements although the Cape York Regional Plan describes natural wildlife corridors as natural habitat in the watercourse systems and permanent waterholes and springs. Any riparian corridor or wetland will be identified during pre-clearing environmental surveys to ensure a 200 m buffer protects the hydrological processes and fauna movement across the landscape. Large trees are also protected during the process to ensure potential breeding places are protected for ENVT species such as the black-footed tree-rat (*Mesembriomys gouldii*), palm cockatoo (*Probosciger aterrimus*) and red goshawk (*Erythrotriorchis radiatus*).

Wildlife habitat for both special least concern and endangered or vulnerable fauna as identified in the MSES reports occurs in both tenements with the closest identified area approximately seven kilometres from the intended exploration area (**Figure 4**).

4.5 Water Quality

High ecological significance (HES) wetlands were identified in the MSES report for both EMP 26573 and EMP 26076, with the closest HES wetland located approximately four kilometres from the intended exploration area (**Figure 4**). The proposed environmental buffer system will ensure that exploration activities will not be conducted in close proximity to riverine or non-riverine wetlands.

As previously discussed, exploration activities will only be undertaken during the dry season, no water is extracted from groundwater, bores or surface waterways and the drilling process does not require the injection or use of water. This will reduce the likelihood of impacting water quality in the area as no direct or indirect release of contaminants to groundwater is likely. Exploration methodology of minimal disturbance during the dry season will reduce the likelihood of adversely affecting riverine and non-riverine wetlands and streams water quality during wet season overland flow.

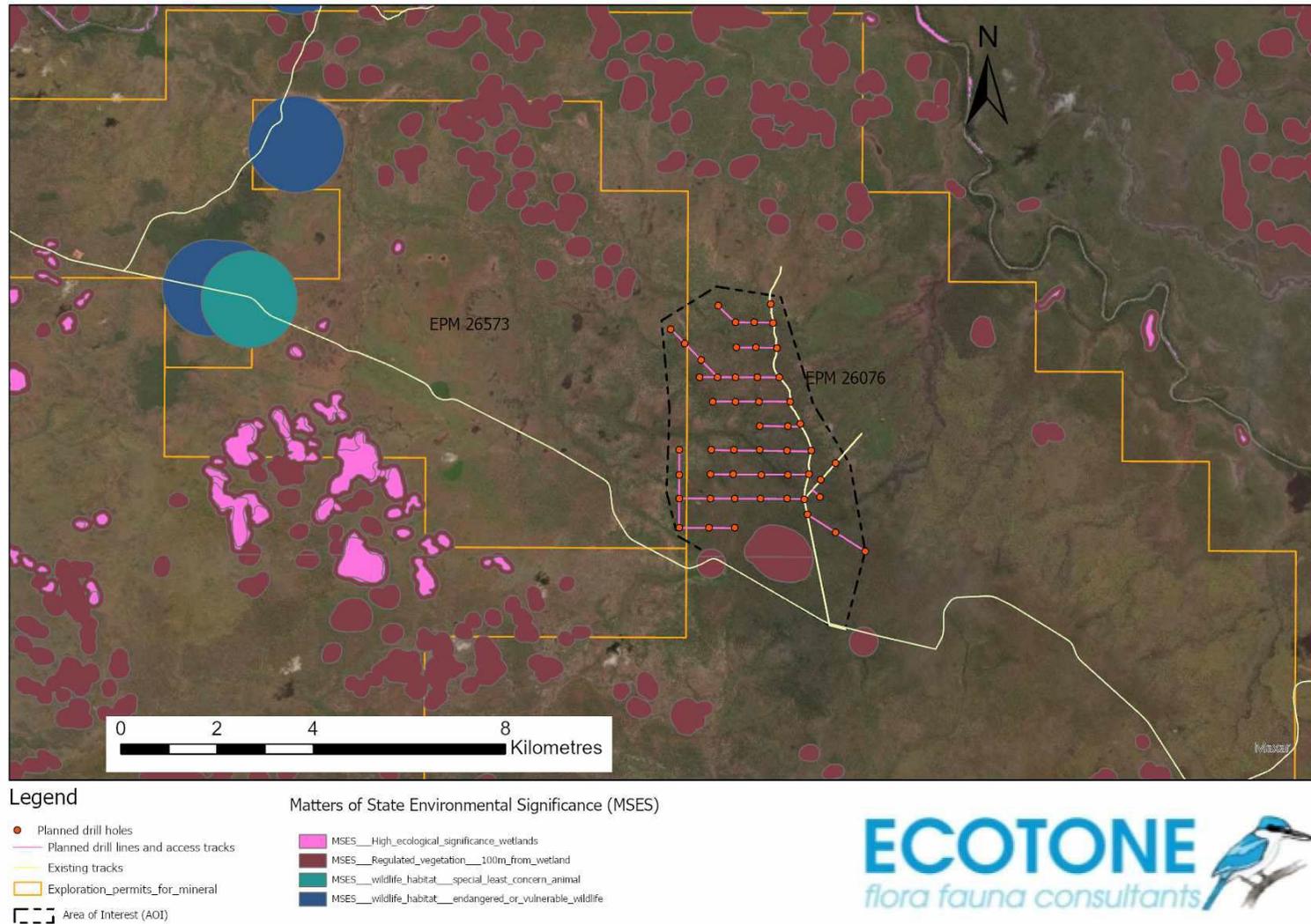


Figure 4 Matters of State Significance: High Ecological Significance (HES) wetlands, buffered wetlands and wildlife habitat areas



4.6 Beneficial Flooding

Establishment of drill lines for exploration activities will result in minimal disturbance to the ground, with negligible change to the natural contours of the proposed area of activity. There will be limited to no surface waterflow across the landscape during the exploration program as the exploration activities will be conducted during the dry season. Wet season overland flows are unlikely to be significantly modified or altered as a result of the exploration activities.

4.7 Threatened Fauna

Approximately 20 threatened and migratory fauna have been identified to occur within the tenements or surrounding area through various searches (within 20 kms of tenements).

Potential adverse effects on these species will be mitigated by employing a minimum disturbance approach to track establishment and by conducting targeted preclearing environmental surveys for threatened species along new tracks established for the works.

The preclearing environmental surveys will comprise systematic surveys along all new tracks to be established for northern quoll and black-footed tree-rat, and targeted searches for active breeding places of red goshawk and palm cockatoo.

For the preliminary assessment works involving vehicle access across the area and use of a hand auger to assess subsurface geology, the following measures will be employed to avoid impacts on threatened fauna:

- Avoid moving hollow logs on the ground and avoid all trees, as black-footed tree-rats northern quolls, and short-beaked echidnas (*Tachyglossus aculeatus*) could be utilising the hollows.
- Ensure any auger holes are at least five metres from any active burrows visible on the ground surface.
- Immediately backfill holes with remaining excavated material to prevent animals falling into them and becoming trapped, and to prevent other people that may use the area from injuring themselves.

Similar measures will be employed for the exploratory drilling program, particularly:

- Large trees will be retained to avoid disturbing potential breeding places of EVNT species black-footed tree-rats, palm cockatoos, rufus owls (*Ninox rufa mees*), masked owls (*Tyto novaehollandiae Kimberli*) and red goshawks.

4.8 Threatened Flora

Approximately 25 Endangered, Vulnerable or Near Threatened (EVNT) flora species were found to occur within 25 km of the AOI. Most are unlikely to occur in the AOI as they tend to occur in rainforest, vine-thicket, riparian vegetation or swamps and thus will be protected by the buffer system. *Acacia ommatosperma* (Near Threatened) is the most likely species to occur in the AOI and will be included in environmental survey searches along drill lines prior to clearing.

A search for "Of Concern" RE 3.9.5 (Table 1) will be included in the preclearing environmental survey along the proposed drill lines and access tracks to ensure that this RE will not be adversely impacted



during exploratory activities. However, it is unlikely to occur in the target areas as the underlying bauxite geology does not support this RE.



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