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ECOSYSTEM SERVICES

ST PATRICKS PLAINS WIND FARM PTY LTD – ST PATRICKS PLAINS WIND FARM

ENVIRONMENTAL IMPACT STATEMENT, 29 JUNE 2023

ADDITIONAL INFORMATION REQUIREMENTS – AGENCY and PUBLIC COMMENTS

Response to comments – Miena cider gum

Comment 38 - NRE

1. It is unclear whether avoidance of impact on *Eucalyptus gunnii* subsp*. divaricata* (Miena cider gum) is feasible, as current data has not been provided.
2. It is known that there are numerous trees in close proximity to the proposed footprint of works on and near Watkins Road, which could make implementing the specified exclusion zones difficult.
3. NRE Tas notes that it would be preferable to avoid this important population completely. The EIS does not address proposed mitigation measures if *Eucalyptus gunnii* subsp*. divaricata* trees are found within the footprint and cannot be avoided, for example if *Eucalyptus gunnii* subsp*. divaricata* trees will be impacted through widening of the service road or tree pruning to enable large machinery to pass through. It may not be possible to avoid impacts to *Eucalyptus gunnii* subsp*. divaricata* trees with the current proposal. If the species is recorded within the footprint or too close to allow the specified exclusion zones, then NRE Tas recommends a modification to the project design is considered in order to avoid impacts to *Eucalyptus gunnii* subsp*. divaricata.*
4. Provide additional detail regarding the distribution and location of the Miena cider gums at a scale which demonstrates whether the proposed exclusion zones around areas hosting these species are feasible.
5. Discuss the extent to which the proposed infrastructure will limit potential for further recruitment of Miena cider gums in the area, and how such impacts are able to be avoided or managed.
6. Clarify why it is proposed that infrastructure be located close to the stand of cider gums near Watkins Road, and whether there are any alternative locations for such infrastructure which would more fully avoid impact on this species.

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Comment 59 – public submissions

7. Potential loss/impact on Miena cider gum (*Eucalyptus gunnii* subsp. *divaricata*), both from disturbance and also impacts of drying conditions from turbines, additional heat from roads.
8. Healthiest stand is impacted by major component of proposal, just north of big bend in Shannon River; road hardstand, substation, operations facility, wind turbines. Stand is critical to survival of species; not taken into account in EIS; listing statement notes it is a 'large important population'. A number of threats to the species have been ignored: access road upgrade, major extent of hardstand, worksite areas, potential flooding and changed water flows created by roading, effect of fire from turbines, drying effect (microclimate), blade throw, turbine collapse near stand, setback distance not adequate. Precautionary principle. Note the cultural significance given historical use by indigenous communities. Population should be considered as a stand and should be avoided altogether.
9. Why is it not considered a listed threatened community?
10. Access road (Watkins Road) upgrade and proposed widening passes through stand of Miena cider gum; is there a better alternative for this road?
11. Giving consideration to the cluster of Miena cider gums near Watkins Road as an important population of this threatened species, and the extent of infrastructure proposed in the area, it is recommended all options for avoidance of this population, including avoidance of the vicinity to enable future recruitment, be explored. If avoidance is not feasible, detailed reasons for this conclusion must be provided, with strong mitigation measures to minimise impact to the area, both during construction and operation.

Responses

- Currency of data (and taxonomic gradation) – sub-comment 1

It has been noted the surveys undertaken to inform the impact assessment did not provide any additional records of this taxon (*Eucalyptus gunnii* ssp. *divaricata,* the Miena cider gum). The terrestrial ecology report (presented in Appendix C of the EIS) specifies that the distribution of this taxon was considered to be well mapped prior to project-specific assessments, as it was known the species had been subject to monitoring within the conservation covenants along Watkins Road (specific to the taxon) and had been the source of seed collected for the Tasmanian Seed Conservation Centre. Given that threatened species locations under monitoring are typically registered on the Natural Values Atlas (NVA), as are species designated for protection within conservation covenants, and given it is typically a permit requirement that any threatened flora collected (including seed collections) have their locations lodged on the NVA within 3 months of collection, it was reasonably assumed the distribution presented on the NVA at the time of writing the assessment (2020) was an accurate account of all individuals that had been verified as *E. gunnii* ssp. *divaricata*. This was supported by the fact that records available at that time from the NVA were clustered in the only general area of the site in which the taxon was observed (as remaining extant and not dead) during assessments for this project. Outside of this recognised population extent, there were no further living individuals observed that accord to the definition of the taxon. The

terrestrial ecology report also took the conservative approach of mapping habitat for the taxon as all areas covered by *Eucalyptus gunnii* woodland (DGW), the community that is dominated by the parent species (regardless of the subspecies). The recommendations included that a micro-siting approach is applied to any of the final areas in the footprint that occur within native vegetation (including DGW) and that the final footprint is subject to a search (to a 15 m radius) for unmapped examples of *E. gunnii* ssp. *divaricata*, which are then recommended to be protected with a radial exclusion zone of 12 x their diameter at breast height (referred to as a tree protection zone – TPZ), consistent with Australian Standard for the Protection of Trees on Development Sites (AS 4970-2009) – noting the maximum TPZ is capped at 15 m, hence the specified search buffer. Generic recommendations around all threatened flora locations also applied.

Following submission of the EIS and receipt of the above comments, we were supplied with an unpublished report detailing the browsing protection works around cider gums on site, containing observation point data that had not at that time been shared on the NVA[1]. An extension survey on the regional distribution and population size of the Miena cider gum was also conducted in 2010 and was consulted for additional data[2], noting this project mostly collected data in polygon format, with some representative points from within sub-populations – NVA record notes from the two points attributed to the St Patricks Plains subpopulation state that GIS files were submitted to the "TSS" (referring to the Threatened Species Section of the then Department of Primary Industry Water and the Environment) but these do not appear to have been made available by the TSS on the NVA. At the time of writing this response, the Australian Virtual Herbarium (AVH; which aggregates collections from Australian herbaria) does not hold records of vouchered specimens of *E. gunnii* ssp. *divaricata* from the Watkins Road subpopulation and it is not apparent from observation notes on the NVA (nor within the unpublished report) if material from all purported examples of this taxa on St Patricks Plains have been verified at the Tasmanian Herbarium (index herbariorum code HO).

The nearest herbarium verified specimen of *E. gunnii* ssp. *divaricata* to Watkins Road is specimen #3437 (catalogue number HO16281) attributed to 4.1 km south-southeast of Watkins Road, with the locality specified as "*Near Steppes*" and spatial inaccuracy of 1 km (Figure 1). This reported location is not at risk from the project footprint (nor within 1 km), noting that the record is from 1949 and is most likely to represent an occurrence in one of the conservation covenants north of the attributed location or a past dead occurrence, noting for instance the level of senescence in the past population behind the Steppes Hall north of the reported location. In addition, 3.6 km northwest of Watkins Road and 1 km northeast of Wihareja Lagoon, attributed to within a conservation covenant in the project area (Figure 1), are two other verified specimen locations attributed to the same spot (noted to be asserted duplicates) from 1979. Specimen #380 (catalogue number CBG 8007453.1) is attributed to the parent taxa *E. gunnii* – this herbarium specimen has not been identified further than the species level (*i.e.* not definitively attributed to subspecies), with the record notes stating: "*Tree 6 m tall, 50 cm DBH. A form with buds and fruit similar to Eucalyptus urnigera*." This record has 10,000 m spatial inaccuracy and the location notes say "*Lakes Highway, 53.3 km north-west of Bothwell*", which indicates that it was in fact collected around the Great Lake

[1] Derwent Catchment Project (2021)
[2] ECOtas (2010)

rather than the St Patricks Plains site. The second duplicate attributed to the conservation covenant location northeast of Wihareja is specimen #381 (CBG 8007452.1), which is stated to be "*Tree with massive bole. 15 m tall, 2 m DBH*" and collected from *Lakes Highway, 53.8 km north-west of Bothwell*, which is again around the Great Lake area.

Two subspecies of *E. gunnii* are currently recognised (collectively referred to as cider gums), with *E. gunnii* ssp. *divaricata* the threatened taxon in question, while *E. gunnii* ssp. *gunnii* is not threatened and more widespread (but also occurring within the range of ssp. *divaricata*). The taxonomy around *E. gunnii* and closely related species is recognised as being complex, with variations and gradations between *Eucalyptus gunnii*, *E. archeri* and *E. urnigera* noted in the extension survey[3]. The Tasmanian Herbarium refers to the *E. gunnii* group as being morphologically complex, with many forms demonstrable and some forms probably ecoclinal (varying along an ecological gradient)[4]. The morphological differences have been shown to have a genetic basis[5], however molecular studies have failed to find significant neutral DNA differentiation between the members of this complex[6]. Further research is broadly recognised as being required to clarify the morphological and taxonomic boundaries within this complex[7].

The aforementioned population extension study defined the main morphological traits they used to determine subspecies *divaricata* as the presence of juvenile foliage (which is characteristically glaucous, with broadly obtuse to retuse leaf tips, and which is broader than it is long), and buds and fruit that are usually glaucous sub-urceolate (slightly urn-shaped); they noted this subspecies also has a distinct lack of oil glands (in foliage) compared to other related species[8]. It was noted mature trees of both subspecies were observed as having similar form, thus the 'divaricate' form was not a reliable identifying trait in adult trees[9]. These are broadly consistent with the traits referenced by the Tasmanian Herbarium[10] and traits we use to discriminate the subspecies in the field – the excerpt below is from the relevant part of the Flora of Tasmania Online:

1. Small to medium trees with suberect to spreading branches and small crowns; twigs, leaves, buds and fruits grey-green to subglaucous; oil glands in leaves readily discernible; buds and mature fruit subhemispheric to ovoid-truncate (Central Plateau, Eastern Tiers, Snug Plains) 15a subsp. gunnii

1: Large trees usually with massive, widely spreading branches and large, rounded crowns; twigs, leaves, buds and fruit very glaucous; oil glands in leaves scarcely conspicuous; buds and mature fruit distinctly cylindrical to suburceolate (chiefly eastern, western and southern shores of Great Lake, Miena) 15b subsp. divaricata

[3] ECOtas (2010) and within Potts (1985); Potts & Reid (1985a,b)
[4] MF de Salas (Ed.) Flora of Tasmania Online (2024)
[5] Potts (1985); Potts & Reid (1985a,b); Threatened Species Section (2010)
[6] Hudson (2007)
[7] ECOtas (2010); MF de Salas (Ed.) Flora of Tasmania Online
[8] ECOtas (2010)
[9] ECOtas (2010)
[10] Gray AM, Craven LA & Lepschi BJ (2019). Myrtaceae, version 2022:1. In MF de Salas (Ed.) Flora of Tasmania Online. 61 pp. (Tasmanian Herbarium, Tasmanian Museum and Art Gallery: Hobart). https://flora.tmag.tas.gov.au/treatments/myrtaceae/

The unpublished report on browsing protection at St Patricks Plains does not reference characteristics used to determine the identification of cider gums to the subspecies level.

To more accurately define potential impact to the species at this point in the planning process (notwithstanding the recommendations for micro-siting and a targeted search for this taxon around the final footprint), a site visit was undertaken on 13/12/2023 to further consider individual cider gum trees closest to the impact area around Watkins Road (with no risk considered to be likely elsewhere) – three trees were the main focus of this assessment, being the three trees closest to the footprint (these are referred to as Tree A, B and C below).

In particular, we inspected an individual that has been caged as part of the browsing protection works and is situated relatively close to Watkins Road (Tree A; Figure 2, Plate 1). A small amount of material could be reached from outside the grazing exclosure and was taken to HO for an opinion on identification (Plate 2) – noting the material was limited due to constrained access from the exclosure and a lack of fruiting material. The conclusion from the herbarium was consistent with our assessment in that the individual is somewhat intermediate between *Eucalyptus gunnii* subsp. *gunnii* and *E. gunnii* subsp. d*ivaricata* - "The large tree habit with drooping branches and the leaves are more consistent with subsp. *divaricata*, though the fruit are more like subsp. *gunnii*." It was also noted in the field that oil glands in the foliage were readily discernible, consistent with the above definition of ssp. *gunnii*. If the individual tree is taken as intermediate between ssp. *divaricata* and ssp. *gunnii* it may not necessarily be subject to the same protections under the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) as true examples of the listed taxon. NRE made a policy decision in February 2022 that a specimen identified as having an affinity with a listed taxon is a different entity to the listed taxon, and therefore does not have the same legal protections. Whilst the designation 'affinity' (more correctly species *affinis*, which is typically abbreviated to aff.) is not used for clinal gradation, it is reasonable to suggest the same principle could apply in that individuals along a clinal gradient are technically not truly representative of the taxon to which the threatened listing applies and are thus not subject to the same protections and assessment requirements. In the case of Tree A on site, if the project impacts are determined by an arboriculturist (see later amendments to recommendations) to be beyond mitigation and avoidance and likely to result in mortality, NRE and DCCEEW may be required to establish if the threatened species protections afforded to *E. gunnii* ssp. *divaricata* apply to clinal individuals. In addition, at that point it would be warranted to undertake any further species identification possible of the individual tree to more definitively establish it could be categorically allocated to either of the described taxa at the end of the gradient.

An additional tree (Tree B; Figure 2; Plate 3) was investigated as its TPZ encroaches into the edge of the construction disturbance buffer – noting that the NVA record for this species from the 2018 seed collection is inaccurate by around 50 m (and the maximum TPZ taken around the NVA location does not overlap with the construction area). This tree was found to be on the brink of death and with no possibility of getting adequate material to definitively establish the identification – although it is a very large tree and epicormic regrowth was not glandular (Plate 4), suggesting it is reasonable to attribute to the ssp. *divaricata* taxon.

An additional tree to the south (Tree C) in proximity to the potential impact area of turbine 39 was confirmed as dead (Plate 5).

It is considered to be unlikely that the area supports additional individuals that are definitively attributable to *E. gunnii* ssp. *divaricata* that the project will not be able to avoid or satisfactorily mitigate construction impacts to with the amended recommendations below.

- Avoidance feasibility and additional detail regarding reported locations and proximity to footprint – sub-comments 2, 4 and 11
- Impacts to St Patricks Plain stand more broadly – sub-comments 7 and 8
    - It was noted in submissions that the proximity of trees along Watkins Road could make implementing the specified exclusion zones difficult, with AS 4970-2009 specifying exclusion areas (TPZs) should be 12 x each trees diameter at breast height, to a maximum of 15 m, and our maps indicatively showing maximum TPZs of 15 m (Figure 2), which in many cases is likely to be required based on the size of trees.
    - Figure 2 shows that for all known/reported locations of live *E. gunnii* ssp. *divaricata*, avoidance of a maximum TPZ of 15 m is likely to be achievable for individuals other than Tree A, which may be an intermediate individual along a cline between *E. gunnii* ssp. *gunnii* and *E. gunnii* ssp. *divaricata*, and Tree B, which is almost dead and extremely unlikely to be considered to have any meaningful viability if assessed by an arboriculturist.
    - Nonetheless, regardless of the seemingly near mortal state of Tree B, it is likely to be possible for the proponent to adjust the construction disturbance buffer (or apply an exclusion zone) such that a radial buffer of 15 m can be preserved around the tree. This is considered to be consistent with the existing recommendation and as such doesn't require amendments or additional recommendations at this point.
    - With respect to Tree A (ignoring the potential taxonomic difficulties), there will be sufficient TPZ incursion to this tree that an arboricultural assessment is warranted to advise on mitigation options to limit the likelihood of works within the TPZ resulting in dieback – noting that complete avoidance will not be possible as the access alignment along Watkins Road is constrained by adjacent conservation covenants. Given that cider gum trees can maintain reasonable health in close proximity to sealed roads (Figure 6) and given that the proposed construction at this location is only for an upgrade to the existing road, it is likely that TPZ incursion can be managed without risk of serious dieback or mortality. This is recommended to be determined through an arboricultural assessment to be undertaken throughout the impact area wherever the requisite TPZ can't be applied around a *E. gunnii* ssp. *divaricata*. There are a suite of arboricultural (and engineering) solutions that can be applied in scenarios such as Watkins Road to maintain tree health while operating within TPZs – these include perforated ramps over root zones (permanent or temporary – albeit noting these could be limited in utility in this case due to heavy vehicle requirements), use of permeable substrates, and supplementary watering – it is considered highly likely Tree A can be retained with arboricultural advice and one or a combination of available mitigation and avoidance measures.

- As Tree C is dead (and based on the location wouldn't have TPZ overlap with the footprint anyway), it is not considered to warrant any additional targeted mitigation.
- In addition, three historical NVA records of *E. gunnii* subsp. *divaricata* occur on the outer edge of the proposed disturbance footprint southeast of Watkins Road (Figures 1 and 2) – however, analysis of a series of aerial photographs and field verification have confirmed that trees are no longer present at these locations (having died/fallen/been removed) – thus, no targeted mitigation is required at these past locations beyond the existing recommendations (*i.e.* the area would still be searched before works for new plants).
- We acknowledge that some of the NVA records appear to be relatively inaccurate in relation to tree canopies of the likely *E. gunnii* ssp. *divaricata* evident on aerial photos – we have made manual adjustments to accommodate for this inaccuracy in relation to Tree B, but there may be other individuals along Watkins Road for instance that are closer to the potential impact area than records indicate (Plate 7) – the current assessment has focussed on those most apparently at risk. Given this stretch of access road will already be subject to the recommendation for a targeted search to a buffer of 15 m and will already require arboricultural solutions for Tree A, it is considered to be satisfactory for the existing recommendations to cover this risk of inaccuracy and additional trees requiring TPZ mitigation. As an added measure of certainty however, we propose to strengthen the recommendation by specifying it must be undertaken with a differential GPS (DGPS), which will provide sufficiently high accuracy to accommodate for precise determination of locations, impacts and requisite buffers.
- Given the extent of occurrence for this taxon is approximately 46,924 ha (determined by a minimum convex polygon of confirmed sites), the subspecies has a maximum linear range of around 80 km[11]. The estimated area of occupancy is 975-990 ha[12]. The population is estimated to contain less than 2,500 mature trees[13], with the St. Patricks Plains subpopulation at last estimates considered to have around 60-100 mature specimens[14].
- With the current design and the recommendations in place, losses of *E. gunnii* ssp. *divaricata* from works are likely to be zero or, if arboricultural solutions are not sufficient and/or additional plants are found to be at unmanageable risk from either plants currently being unmapped or mapped with poor accuracy, potential impacts are still not considered likely to be higher than in the range of 1-3 plants. As such, at worst the mortality of this many trees would not be considered significant at the population level (based on EPBCA criteria) and would be marginal at the subpopulation scale (if that was taken as a meaningful level to assess at). Given these upper limits of impacts are considered to be unlikely and avoidable with the recommendations in place, the current understanding of the distribution on site is considered to be sufficient for the assessment purposes.
- Concerns raised in submissions about operational impacts are considered to be largely unfounded and inconsistent with listed threats in conservation advice, noting the

[11] ECOtas (2010)
[12] ECOtas (2010)
[13] Threatened Species Section (2010)
[14] ECOtas (2010); Threatened Species Section (2010)

comments provided in the supplementary request do not appear to address the recognised threat of climate change to the species and the potential contribution a renewable energy project may have in addressing that. Threats such as blade throw, drying, turbine collapse, altered hydrology and fire from turbines are considered to be tenuous at best and negligible risks in relation to the proposed impact area, the genuine ecological risks associated with such factors and the various general environmental principles the project will be required to meet in relation to broad factors such as hydrology and fire risk.

- Rationale for location of infrastructure - sub-comments 6 and 10
  - The alignment along Watkins Road provides a straight line of access for heavy vehicles during the construction phase, with the route being selected on the basis of using the existing road easement and avoiding a more circuitous route that would be unsuitable for the turning requirements of the heavy vehicles – having a straight alignment also minimises the potential need for adjacent pruning to accommodate the sweep zones associated with turns (although in this scenario this benefit might be limited on the basis of nearby non-forest environments that wouldn't necessarily require pruning).
  - From an ecological perspective (*i.e.* independent of the requirements of vehicles) alternative alignment is conceivable to avoid the adjacent root zones of cider gums along Watkins Road and not encroach within the DGW community, however an alternative alignment just to bypass the Watkins Road alignment would invariably have to result in additional impacts to the highland *Poa* grassland community (TASVEG – GPH), which is listed as threatened under the Tasmanian *Nature Conservation Act 2002* and provides habitat for multiple TSPA and EPBCA values. The alignment along Watkins Road may thus reasonably be seen to have the lower net environmental impact overall with respect to conservation significant flora and fauna.
- Community conservation status – sub-comment 9
  - A submission asked why is "it" not considered a listed threatened community. Presumably this relates to the DGW community, as a taxon in itself (e.g. *E. gunnii* ssp. *divaricata*) does not get listed at the community level (even if presence and dominance of the taxon may be what defines the community).
  - At the community level under the TASVEG classification system and with respect to communities listed under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, intraspecific variation in the *E. gunnii* complex is not recognised nor differentiated into different units.
  - Forest and woodland around Watkins Road was mapped in the ecological assessment as *Eucalyptus gunnii* woodland (TASVEG – DGW). This community is dominated by *E. gunnii* (either subspecies) and typically occurs in poorly drained sites across the Central Plateau, with isolated occurrences in the eastern tiers and Ben Lomond region[15]. This community is not listed as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, and it is well reserved at both the State and bioregional level (86 % of occurrences are reserved within the Tasmanian Reserve Estate).
- Impacts of infrastructure on recruitment – sub-comment 5

[15] Kitchener & Harris (2013)

- Outside of the grazing exclosures, recruitment is currently limited largely by browsing pressures of native and introduced herbivores on site, which is recognised as a primary threat to the species in State and federal conservation advice. The grazing exclosures already provide protection to a number of individuals on site and the main stand to the north of Watkins Road. The exclosures will not be compromised by works nor operations.
- Conservation advice for this taxon does not list infrastructure as a constraint on recruitment (other than indirectly through land clearance). Operational infrastructure for this project such as roads and hardstands will not conceivably impede recruitment nor dispersal on site as they will cover a minor fraction of potentially suitable habitat for the species within viable dispersal distance of existing plants. Recruitment occurs elsewhere on equivalent infrastructure such as roadsides, including the Highland Lakes Road (noting survival is typically improved with browsing protection).

- <u>Additional mitigation measures – sub-comment 3</u>

Relevant mitigation measure proposed in the natural values assessment report are as follows:

1. In addition to avoiding the direct loss of sites, the general areas around threatened and conservation significant flora locations should be protected from indirect or inadvertent impacts by designating construction exclusion zones around any known occurrences within 20 m of proposed works – exclusion zones must be specified within the construction contracts and the exclusions should cover but not be limited to mechanical disturbance, dumping of fill, alteration of drainage patterns and soil compaction. Physical barriers or cordons should be applied as necessary to reinforce the exclusion requirements. There is also considerable scope for selective avoidance within the construction disturbance buffer, as the proportional impacts can be lessened in this buffer with targeted surveys and exclusion areas within the overall buffer.
2. Apply micro-siting approach (with the aid of an ecologist) to areas of the final footprint within native vegetation – the micro-siting should aim to make minor adjustments to the footprint on the ground by selecting localised areas with relatively less important values (e.g., lower condition areas), as well as maintaining variation within a community across the project area (e.g., protecting different facies within a community where fine scale variation is present).
3. The margin of the final footprint should be surveyed for *Eucalyptus gunnii* ssp. *divaricata* to a radius of 15 m (the maximum tree protection zone under Australian Standard for the Protection of Trees on Development Sites (AS 4970-2009) – any individuals of the species found within the buffer (and alive) should be protected with a radial exclusion zone proportional to 12 x diameter at breast height (as per AS 4970-2009).

In addition, we have proposed an additional recommendation:

4. Where *Eucalyptus gunnii* ssp. *divaricata* is confirmed and can't be avoided by the requisite TPZ as per AS 4970-2009, an arboricultural assessment is required to advise on avoidance and mitigation techniques that must be employed to

minimise the potential for dieback and maximise the scope for preservation of each tree. Where the arboriculturist concludes mortality is likely, or mortality is found to occur while monitoring during construction (or longer if specified by an arboriculturist), requirements of impacts to a threatened species under the TSPA and EPBCA should apply (noting this may require clarification and confirmation over the treatment of individuals that are intermediate examples between a threatened and non-threatened taxon – and also noting with respect to the EPBCA that the potential upper level of impacts to root zones is not considered likely to be a risk of breaching significant impact criteria).

In addition, we propose recommendation 3 is strengthened with the following addition:

- The margin of the final footprint should be surveyed for *Eucalyptus gunnii* ssp. *divaricata* to a radius of 15 m (the maximum tree protection zone under Australian Standard for the Protection of Trees on Development Sites (AS 4970-2009) – any individuals of the species found within the buffer (and alive) should be protected with a radial exclusion zone proportional to 12 x diameter at breast height (as per AS 4970-2009). **This survey (including marking the locations of all *E. gunnii* ssp. *divaricata*) must be undertaken with a DGPS for precision.**

Conclusion

Based on the current understanding of *E. gunnii* ssp. *divaricata* on site (notwithstanding taxonomic complexity and uncertainty around the definitive identification of all potential individuals), it is considered unlikely that the area supports additional individuals (whether they be currently unmapped or mapped with poor accuracy) that are definitively attributable to *E. gunnii* ssp. *divaricata* that the project will not be able to avoid or satisfactorily mitigate construction and operational impacts to with the amended recommendations.

With the current design and the recommendations in place, losses of *E. gunnii* ssp. *divaricata* from works are likely to be zero or, if arboricultural solutions are not sufficient and/or additional plants are found to be at unmanageable risk from either plants currently being unmapped or mapped with poor accuracy, potential impacts are still not considered likely to be higher than in the range of 1-3 plants (and expected to be restricted to impacts within TPZs only, rather than direct clearance requirements). As such, at worst the mortality of this many trees would not be considered significant at the population level (based on EPBCA criteria) and would be marginal at the subpopulation scale (if that was taken as a meaningful level to assess at). Given these upper limits of impacts are considered to be unlikely and avoidable with the recommendations in place, the current understanding of the distribution on site is considered to be sufficient for the assessment purposes.

Based on this, there is considered to be sufficient confidence in the available information (and mitigation options available) for the recommendations to be applied as conditions of approval.

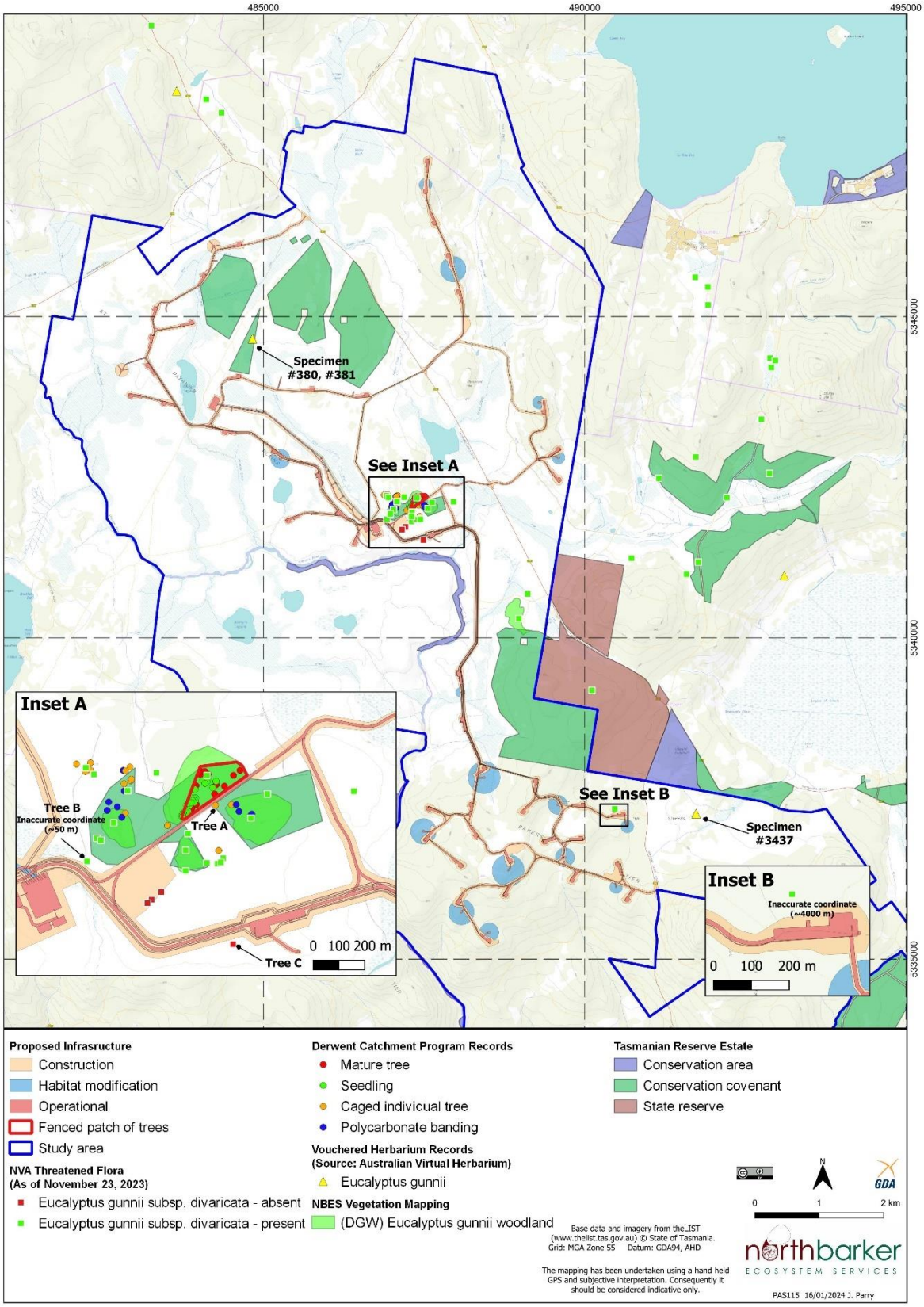

Figure 1: All reported NVA observations of E. gunnii ssp. gunnii, Derwent Catchment Project reports, and vouchered herbarium specimens of E. gunnii attributed to the project area (and nearby areas)

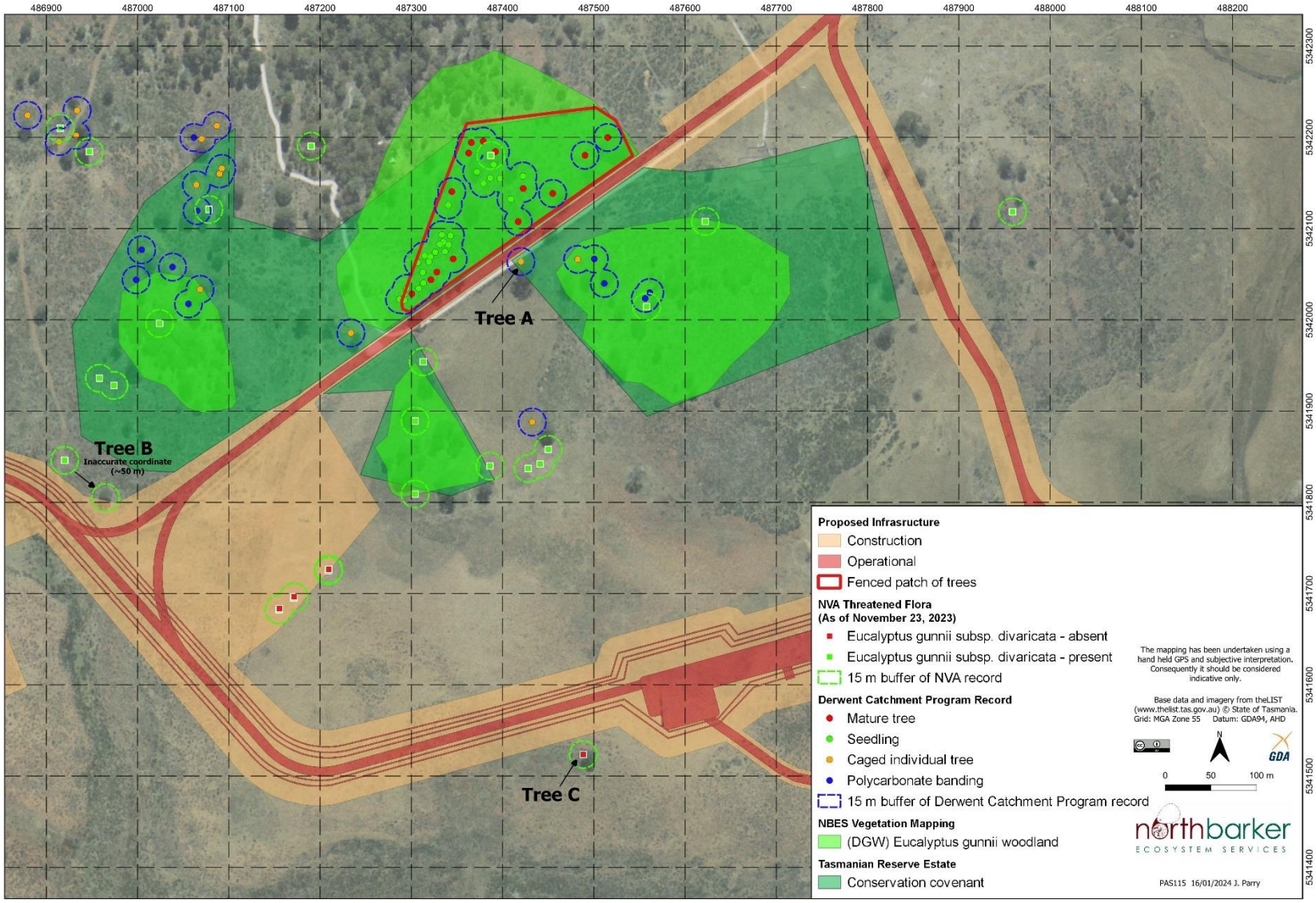

Figure 2: Reported E. gunnii ssp. *divaricata, relevant conservation covenants and mapped extent DGW around Watkins Road*

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Threatened Species Section (2010). Listing Statement for *Eucalyptus gunnii* subsp. *divaricata* (Miena cider gum), Department of Primary Industries, Parks, Water and Environment, Tasmania.

Appendix A: Photos

Plate 1: Tree A, adjacent to Watkins Road, with estimated 6-8 m separation to edge of road, but with TPZ encroachment > 10 % expected from the proposed development at this location due to the pinch point with the grazing exclosure on the other side of the road and the associated cider gums – engineering/ arboricultural solutions are likely to be required to limit detrimental root zone impacts along this section of the alignment, but this is likely to be achievable based on roadside occurrences elsewhere not necessarily suffering disproportionate dieback (compared to individuals away from roads) and the array of available solutions that can be tailored to the site-specific requirements.

Plate 2: Foliage detail of Tree A – considered to be broadly consistent with ssp. *divaricata* but also noting limited glaucousness on branchlets (twigs) and that glands were relatively apparent within the foliage, as well as fruit that were considered to be more consistent (shape and lack of glaucousness) with ssp. *gunnii*.

Plate 3: Tree B – considered to be almost completely dead, with very minor epicormic regrowth considered unlikely to be capable of long-term recovery but requiring an arboricultural assessment to confirm this.

Plate 4: Tree B – epicormic regrowth was not readily discernible as glandular, although also did not have glaucous branchlets.

Plate 5: Tree C – dead (located in proximity to turbine 39).

Plate 6: Cider gum closely adjacent to Highland Lakes Road and ostensibly in reasonable health (canopy is somewhat thin with some dieback – note we have not had an arboricultural assessment on this tree).

Plate 7: Most trees within the large exclosure north of Watkins Road are likely to have adequate separation for a maximum TPZ as per AS 4970-2009 – individuals close the fenceline along the roadside however will require precision geo-marking with a DGPS and will require an arboricultural assessment if TPZ encroachment requires mitigation.