

Post-SEIS response for Noonamah Ridge





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1 Introduction

The Noonamah Ridge development represents a unique opportunity to deliver a rural character subdivision in Darwin's hinterland that has taken a master-planned and environmentally-responsible approach to subdivision design.

Master-planning has the following key benefits:

- Roads and service provision can be designed in a co-ordinated fashion.
- Design can occur in accordance with land capability.
- Open space and conservation land can be clearly identified, and environmental objectives achieved at a large scale, rather than on a site-by-site, ad-hoc basis.
- Stormwater management can occur holistically.
- Cumulative impacts can be assessed and planned for, specifically in terms of planning required road upgrades and the provision of social infrastructure.

Intrapac's approach will ensure that development occurs in a co-ordinated fashion, resulting in the delivery of much needed social infrastructure, improved services and road connections, with a strong emphasis on the protection of threatened and vulnerable species. This is in contrast to the pattern of recent subdivision in the rural area which occurs on a largely incremental basis, with limited consideration for broader impacts.

A master-planned and environmentally-responsible approach is consistent with Intrapac Projects' reputation. The company currently holds the record nationwide for certifying the most EnviroDevelopment projects, a highly coveted recognition by the Urban Development Institute of Australia of the application of environmental sustainability to residential housing developments. It is this dedication to environmental outcomes that supports Intrapac's proposal, and underpins the approach to the Noonamah Ridge EIS.

This document is the response to the request from the Northern Territory Environment Protection Authority (NT EPA) on 8 July 2016 for further information to that supplied in the Supplementary Environmental Impact Statement (SEIS).

Many of the additional requests for information and clarification have been addressed within Section 2.2 of this document. However, some of the requests for additional information cannot be responded to at the level of detail requested by the NT EPA at this stage in the development. To provide the NT EPA and other stakeholders with some certainty that these matters will be addressed, Intrapac is proposing that the environmental commitments made at the assessment stage (see Appendix A of this document) become a reference document under the *NT Planning Scheme*, meaning the additional information requested by the NT EPA will be required to accompany the preparation of future, staged, subdivision applications. The appropriateness of adhering to this prescribed planning process is explained in Section 2.1.

2 The EIS and Planning Approvals' Processes

As a precursor to Section 2.2 which provides direct responses to comments received from the NT EPA, the purpose of this section is to clearly articulate how the environmental and planning processes align. In doing so, the intention is to provide certainty to the NT EPA and the DENR that the environmental objectives and commitments that arise from the EIS will be adhered to, and implemented.

At present, Noonamah Ridge has a split zoning of RL (Rural Living) to the north, and R (Rural) to the south. Under current planning provisions this would allow the incremental subdivision of the site into lots of 2 ha and 8 ha, commensurate with the above zonings. Approximately 1,500 lots could be achieved across the site, with limited consideration for broader cumulative impacts.

Instead, as detailed below, Intrapac has elected to follow a Planning Scheme Amendment process – with the introduction of the Specific Use zone. This will provide a master-planned, integrated estate that provides a high quality rural environment incorporating social infrastructure and amenities. It is Intrapac's view that this approach will provide improved environmental outcomes.

2.1 The relationship between this EIS and the planning approvals' process

Figure 2-1 illustrates the proposed alignment of the EIS and planning approvals' process, with a stage-by-stage breakdown below.

Stage 1: Completion of the EIS

Assessment of the EIS will result in a comprehensive set of environmental commitments proposed by the Intrapac (see Appendix A of this document), and recommendations made by the NT EPA. The commitments will specifically aim to address biodiversity conservation concerns; the recommendations will outline the NT EPA's requirements for the future development of Noonamah Ridge. The Planning Minister is required to take the NT EPA's recommendations into account when making future decisions in relation to applications made by Intrapac for subdivision and development of the Noonamah Ridge site.

Stage 2: Planning Scheme Amendment application

The current Planning Scheme Amendment application proposes the rezoning of the site to Specific Use zone, incorporation of a concept master plan, and incorporation of an Area Plan and Principles to guide development.

Intrapac proposes to revise this Planning Scheme Amendment application to allow for the environmental commitments arising from the EIS (see Appendix A of this document) to be incorporated in the *NT Planning Scheme* as a reference document. Also incorporated will be relevant recommendations made by the NT EPA in their EIS Assessment Report, and any federal conditions that may result from the Department of Energy and the Environment's review of the Preliminary Information that will be submitted by Intrapac in due course. Such a reference document will embed the outcomes of the EIS into the statutory planning framework, and thereby require each subdivision application to address the environmental commitments directly.

This approach differs to that presented in the original EIS which involved incorporating the text from the environmental commitments into the Specific Use text within the *NT Planning Scheme*. During assessment of the Planning Scheme Amendment application, the Department of Infrastructure, Planning and Logistics raised concerns about the complexity of the proposed Specific Use zone text. Specifically, it was considered too complex for the day-to-day administration of the zone by Development Assessment Services, and for the completion of the relevant technical assessments. Incorporating a reference document achieves the same outcome in a more straightforward manner, and ensures that the intent of the environmental commitments is articulated clearly.

Stage 3: Staged development applications

Following the rezoning, it will be possible to develop the site in accordance with the Specific Use zone. At this stage, and with the certainty provided by the zone, the proponent will be placed in a position to undertake the detailed studies and design work required to lodge a development application for subdivision. Given the size of the site, and the timeframe of development, it is expected that multiple staged subdivision applications will be undertaken over a number of years.

Each will include detailed survey, ground-truthing, stormwater modelling, and any investigations required to support the conservation of threatened species and sensitive vegetation types.

The first subdivision application will include a detailed master plan for the whole development, and each subsequent development application will need to be in accordance with this master plan, or provide a revised master plan.

It is important to note that the requirements of the Area Plan, concept Master Plan and environmental commitments incorporated into the *NT Planning Scheme* will play a pivotal role in the design of the detailed Master Plan and stage-by-stage subdivision. This will ensure the best possible outcome for biodiversity conservation across the site, as compared to the current practice of incremental subdivision of the rural area.

It will be mandatory that each subdivision application address the environmental commitments from the EIS that have been embedded into the *NT Planning Scheme* as a reference document, and further that the Development Consent Authority take the environmental commitments into consideration when assessing and approving a subdivision application.

Part of the development application process includes the circulation of the application to authorities, including the NT EPA and DENR. This process will allow the NT EPA and DENR to impose conditions of approval on any subdivision permit. These can also be as conditions precedent requiring clearance by the authority before commencement of works.

Note: During the detailed subdivision design process, changes may be required to the agreed master plan and/or environmental commitments, as a result of a change to the intended action. Should such a scenario arise, Intrapac proposes to initiate (at the time of lodging a subdivision application) the provisions of Section 14A of the *Environmental Assessment Administrative Procedures*.

Stages 4 & 5: Development Permit & clearing conditions

Once the Development Consent Authority are satisfied that the requirements of the various authorities have been met, they will issue a Development Permit, including a range of conditions precedent and other conditions.

Conditions precedent will need to be met before any works on-site can occur. Clearance of conditions imposed by the NT EPA and DENR will require lodgement of evidence with the DENR and NT EPA for their consideration and clearance. This will ensure that environmental commitments are met.

Stage 6: Development takes place

Once all conditions precedent have occurred, physical development can take place.

During construction, on-site monitoring will be required if imposed as a condition of approval. Similarly, before any new lot can be transferred, clearance of conditions will be required. This could, by way of example, include any site remediation works, protection of threatened vegetation, or any other conditions to the satisfaction of DENR.

Once the subdivision has been completed, the Specific Use zone will be normalised – including designating land set aside for Conservation purposes and Public Open Space – and this land handed over to the agreed party (as discussed in Section 3.2.5).

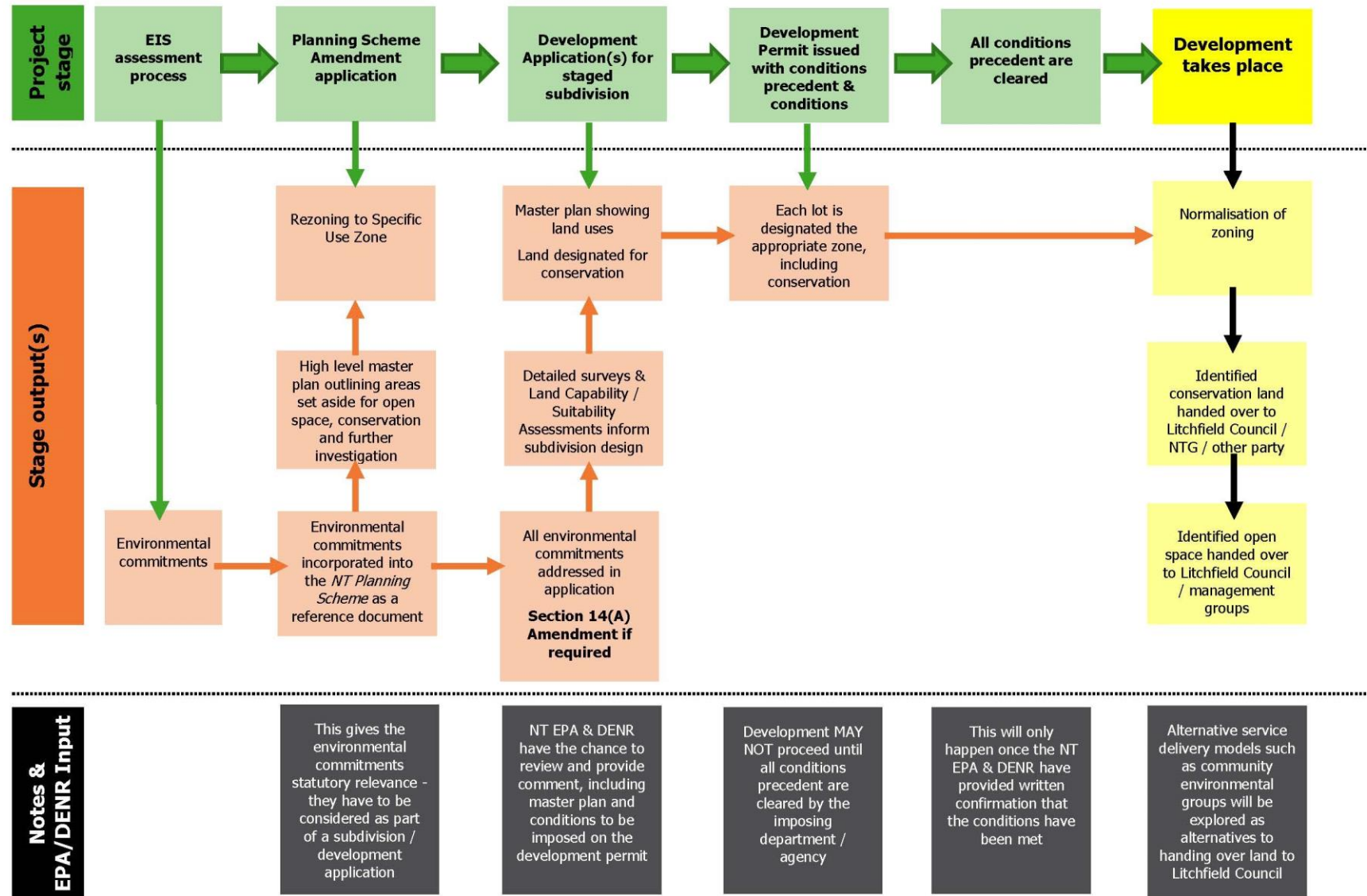


Figure 2-1. Diagram showing the relationship between the EIS and the planning approvals' process

2.2 Alternative scenario – development within the existing zoning

As detailed above, Intrapac has selected to proceed with a master-planned approach to Noonamah Ridge, involving the undertaking of an EIS to inform the project at a high level and to propose a strong framework for biodiversity conservation and management of threatened species.

The alternative to this approach would follow largely the same approach as outlined in Figure 2-1, with the exception that the initial EIS would not be undertaken. Instead, individual subdivisions would be applied for under Development Applications, and placed on exhibition for two weeks. This would include circulation to authorities, including the NT EPA and DENR. At this stage, the NT EPA would consider the subdivision application to be a Notice of Intent and, subject to the amount of information provided, would either make a determination, or request that the project undertake a full EIS. Generally, the small size of these subdivision applications in the rural area has resulted in them being accepted as NOI's, and they have not proceeded to EIS stage.

The process Intrapac has elected to follow in this instance – undertaking an EIS before a subdivision application – allows for high level concerns and environmental objectives to be incorporated into the Area Plan, Master Plan, Specific Use Zone and as a reference document. The result is to ensure a much more co-ordinated response to biodiversity conservation than the traditional scenario explained above. At the same time, the approach that is being followed provides the NT EPA and service authorities with sufficient opportunity to influence the development and subdivision outcomes, and to ensure that environmental commitments are met.

2.3 Understanding the Specific Use zone

Traditionally in the Northern Territory, large scale greenfield subdivision is dealt with through the use of zone FD (Future Development) – for example, the future City of Weddell is currently zoned FD. Development of zone FD requires the incorporation of an Area Plan guiding development, and subsequent subdivision applications in accordance with the zone. Environmental issues, and the preparation of a project EIS for these projects would occur at subdivision stage.

When approaching the proposed development of Noonamah Ridge, Intrapac considered rezoning the property to zone FD. This was not, however, considered the best approach. Zone FD has certain pitfalls, such as waiving the limitation on clearing native vegetation, and would not provide the rigidity of controls to ensure the creation of a rural estate in accordance with Intrapac's vision. Intrapac therefore elected to rezone the land to a Specific Use Zone – creating, in effect, a site-specific Future Development zone.

This particular Specific Use Zone was chosen, and designed, by Intrapac to achieve the following:

- Creation of a planning instrument that will allow for a co-ordinate rural subdivision, that sets the locational requirements for smaller lot sizes, and that defines mitigation measures for minimising social and environmental impacts.
- Requirement for the lodgement of a detailed master plan with the first subdivision application that outlines:
 - The road hierarchy.
 - Land set aside for conservation purposes, open space and recreation.
- Introduction of strict requirements that need to be addressed at the lodgement of each subdivision application, including:
 - Erosion and sediment control plans
 - Stormwater design and management
 - Protection and conservation of threatened species.

Normalisation of zoning

A critical aspect of the Specific Use zone is the normalisation of zoning after each subdivision application approval. The mechanism allows the appropriate zone to be applied to each lot created through the subdivision application process. This will include the designation of the appropriate residential and rural zones, as well as commercial zoning. In addition, of particular importance for this document, the mechanism will ensure that all land required to be set aside as buffer areas or for the protection of threatened species will be designated zone CN (Conservation), with all the requirements associated with that zoning applying.

Similarly, all residential properties created will be normalised to the relevant zoning, defined by existing *NT Planning Scheme* minimum lot sizes. For example, all lots between 800 and 3999 square meters will be normalised to zone SD (Single Dwelling), lots between 4000 and 9999 square metres will be normalised to zone RR (Rural Residential), lots between 1 ha and 7.99 ha will be zoned RL (Rural Living), and all larger lots will be zoned R (Rural). Restrictions on further subdivision will apply to prevent speculative subdivision following private purchase of lots.

3 Responses to information requests

In this section, each of the information requests received from the NT EPA on 8 July 2016 are responded to in turn.

3.1 Risk assessment

Request: The objective of project specific risk assessment is to ensure that significant risks are identified and evaluated such that appropriate risk treatment can be implemented to mitigate risks. Risk assessment provides a mechanism to demonstrate to stakeholders that the project's environment risks are recognised, and that treatment measures are developed to adequately reduce risks to acceptable levels during the execution of a proposed action.

The Northern Territory Environment Protection Authority (NT EPA) requires an EIS to be undertaken in a risk assessment framework. The framework as defined by the International Organisation for Standardisation ISO 3100:2009 Risk Management – Principles and Guidelines, is as follows:

1. Establishment of context
2. Risk identification
3. Risk analysis
4. Risk evaluation
5. Risk treatment
6. Monitoring and review
7. Communication and consultation.

When compared to the above framework, the draft EIS and Supplement establishes the context; and discusses suggested risk treatment, monitoring and review and communicating and consultation throughout the remainder of the draft EIS. However, the credibility of the output of these processes is contingent on the procedures being used correctly and thoroughly. This involves clearly defined steps from ISO 3100:2009, which start with a statement of the objective/s of a particular analysis, the context of the analysis, definition of the risk criteria to be used, and in semi-quantitative/quantitative analyses, use of likelihood and consequence to provide ratings of the risk to attainment of the particular objective/s. It is essential that analyses are based on semi-quantitative or quantitative values only. The qualitative risk assessment that has been provided in the EIS is not acceptable, and should only be applied for scoping studies. Corporate objectives (e.g. reputation, finances, etc.) and identification of sensitive receptors, contaminant pathways, events, event frequencies, are also considered relevant. All steps must be included to provide a rigorous outcome.

The rigour of the analysis is dependent on articulation and use of clearly substantiated justifications for the levels of likelihood and consequence used to determine risk to objectives, and similarly expressed justification for likelihood and consequence in determining the effectiveness of mitigation and subsequent residual risk. Consequence and likelihood need to be assessed individually for each impact before being combined in a cumulative value. To enable confidence in the risk assessment, a rigorous and consistently defined and applied method of assessment and measurement of 'likelihood' and 'consequence' must be adhered to across all impacts. Measurement of cumulative risk must be calculated consistently, and only after individual risk has been calculated.

The level of uncertainty associated with the justifications and responsible entities needs to be addressed. Many of the residual risk scores in the Environmental Impact Statement (EIS) are based on risk treatments that are yet to be finalised or negotiated with third parties. In calculating the residual risk scores in the EIS, Intrapac Projects Pty Ltd (Intrapac) has not properly considered the uncertainties around the mitigation/management measures and assumes that all identified measures will be implemented and

effective. To properly assess the risks to the environment, the level of uncertainty should be considered when deciding the probability that a risk treatment will be implemented.

Public confidence in the outcomes of the risk assessment is critical.

The NT EPA requires that the risk assessment be revised in its entirety to account for inadequacies identified above. The risk assessment must demonstrate how the probability score has been calculated and where any uncertainties relating to implementation or information deficiencies have been considered.

Response: Intrapac agrees that public confidence in the outcomes of the risk assessment is critical, and acknowledges that the risk assessment as presented in the EIS could be improved upon in some regards. However, Intrapac disagrees that the risk assessment is so inadequate as to warrant being 'revised in its entirety'.

The risk assessment presented in the EIS is undertaken within the framework of *ISO 3100:2009 Risk Management – Principles and Guidelines*. Chapter 5 of the EIS addresses all seven principles mentioned in the request above that are recommended within those guidelines¹. For each topic being subject to risk assessment – e.g. Transport – an objective is presented and the context established (with relevant communication and consultation acknowledged), before risks associated with that topic are identified, analysed, evaluated and treated. Monitoring and review are summarised in Chapter 5 and detailed in the EMP in Chapter 6. This is very similar to the risk assessment utilised in the GEMCO EIS process that completed (i.e. condoned by the NT EPA) on 29 February 2016.

It is acknowledged that the risk assessment for this EIS could be improved by using more detailed consequence rankings. However, Intrapac disagrees that *ISO 3100:2009* (or *HB 203:2006*) limits analysis to only using consequence and likelihood rankings that are quantitative or semi-quantitative. In Section 2.5.2 of *HB 203:2006* it is stated that 'environmental risk studies are usually qualitative in nature, except in a few specific circumstances'. Quantitative analysis is appropriate and relevant for risks that have numerical data associated with both the impact and the environmental context. These circumstances tend to be very narrow in focus – an example provided in *HB 203:2006* is failure probabilities for engineering facilities – and rarely apply to the level of risk assessment being applied in an EIS.

The EIS prepared in mid-2016 for the Northern Gas Pipeline project adopts a qualitative analysis of risks, and yet there was no comment made by the NT EPA in their assessment of that document. The abovementioned GEMCO EIS also applies a qualitative analysis of risks, and also received no direction from the NT EPA during the EIA process to do otherwise. The Wellard Rural Exports EIS completed on 11 March 2016 did receive direction from the NT EPA for the SEIS² to include a revision of the risk assessment (with much the same information requirements as that requested for this EIS). Such a direction was warranted given the very general level at which the risk assessment was originally undertaken. Notably, the revised risk assessment for that EIS did not involve a qualitative analysis of risks.

It is further stated in the NT EPA's request above that 'consequence and likelihood need to be assessed individually for each impact before being combined in a cumulative value'. Whilst the importance of assessing cumulative impacts from various sources across a project is noted, none of the recently published EIS's do this successfully; likely because there is no established method for robustly determining cumulative impacts, especially when risks are being assessed using qualitative analysis. A determination of the cumulative impact is undertaken in this EIS some instances – mostly explicitly in the significant impact assessments for threatened species in Section 5.8 of the EIS. At the appropriate stage of the development approval process, both groundwater and hydrological modelling will occur and, because there are many different parameters that

¹ It is important to note that more relevant to the risk assessment for an EIS is Standards Australia's *Handbook 203:2006 Environmental Risk Management – Principles and Process*, to which the risk assessment for Noonamah Ridge EIS also adheres.

² A more appropriate stage of the assessment process for this concern to be raised than after the SEIS has been submitted, as was the case for the Noonamah Ridge EIS.

will then be considered, these modelling will effectively be assessments of cumulative impacts on groundwater and surface water hydrology respectively.

A main concern expressed in the request above is that ‘to properly assess the risks to the environment, the level of uncertainty should be considered when deciding the probability that a risk treatment will be implemented’. Intrapac agrees, hence the inclusion for each topic in the risk assessment of an ‘Effectiveness of Mitigation’ heading, within which justifications are presented for why there is (or, in a few instances, will be, pending further studies) a high level of certainty that proposed mitigation measures not only reduce risks to acceptable levels, but will also be implemented. This is because unlike for many other types of developments that are subject to an EIS, for the Noonamah Ridge development there is also an established parallel assessment process under the *NT Planning Scheme* that will apply for the life of this development. As detailed in the EIS, each subdivision application made within this planning approvals’ process must adhere to the conditions placed upon this development within the *NT Planning Scheme*. Each application also requires the consideration and approval of many different departments – including the NT EPA – and is a transparent process that invites community input. Such a rigorous and ongoing process adds an extra dimension of certainty regarding the management of environmental values that many other developments requiring an EIS do not have.

Intrapac is of the view that complete revision of the risk assessment at this stage of the assessment process would be largely inconsequential. Some risk scores may change a little, but it is Intrapac’s contention that the risk assessment, as presented within the Noonamah Ridge EIS – together with comments received on the EIS and SEIS, and the NT EPA’s requests for additional information – have adequately identified and ranked the project-related activities which could significantly impact upon environmental and social values, and identified whether management can, and will, be put in place to avoid each impact or reduce them to acceptable levels.

The objective of ensuring ‘that significant risks are identified and evaluated such that appropriate risk treatment can be implemented to mitigate risks’ has been achieved in the SEIS. Therefore, Intrapac is not proposing any revision to the risk assessment as presented in the SEIS.

3.2 Threatened species

3.2.1 Partridge Pigeon (*Geophaps smithii smithii*)

Request: Submissions on the draft EIS identified concerns about the status of the Partridge pigeon in the greater Darwin region. The comments requested that further information be provided to understand the importance of the population at Noonamah Ridge in relation to the regional status of the species, given that the local population is unlikely to persist within the development area after the removal of its preferred habitat. The Supplement included a map, which identified historic records of Partridge pigeon, including records from areas where the species has not been found in recent years. The use of historical data in this manner could incorrectly suggest that the species is more common and that the importance of the Noonamah Ridge records is low. Current records to 2013 are available on the NT Fauna Atlas (also available on NR Maps) and are more appropriate than the Infonet data (referred to on page 5-25 of the Supplement). The use of data from the Atlas of Living Australia (referenced on Figure 5-2) in any assessment of the Partridge pigeon should be clarified.

The NT EPA requires:

- An appropriate regional assessment for the Partridge pigeon in the greater Darwin region. The regional assessment should include up-to-date records from appropriate data sources to sufficiently assess the importance of the population at Noonamah Ridge.
- An appropriate assessment of the residual impact to the regional population based on the likely net decrease in habitat available for the Partridge pigeon.

Response: The significance of the presence of Partridge Pigeon within the project area has been re-assessed in light of the information requested by DLRM in the EIS comments, as well as a consequence of preparing the response to Federal Government preliminary information requirements. It is considered that the risks to the global population posed by project activities are likely to be low. The re-assessment is documented below.

Historically, Partridge Pigeon (the eastern subspecies) occurred across the Top End (from Kununurra to Borroloola). There has been a severe range contraction from the western, eastern and southern parts of the former distribution, with most of the declines occurring early in the 20th century (Higgins & Davies 1996; Woinarski et al. 2007). Currently, its distribution is limited to sub-coastal Northern Territory from Yinberrie Hill in the south, Litchfield NP in the west and (western) Arnhem Land in the east (Garnett et al. 2011).

This sub-species was estimated to number approximately 120,000 mature individuals in 2010 (115,000 in the mainland sub-population and 5,000 on the Tiwi Islands) (Garnett et al. 2011). The extent of occurrence (EOO) is estimated with a high level of certainty to be 117,000 km², within which the area of occupancy (AOO) is estimated with a low level of certainty to be 6,000 km² (Garnett et al. 2011).

The NT Fauna Atlas contains records of Partridge Pigeon, as depicted in Figure 3-1. In recent years there have been anecdotal records of Partridge Pigeon in the Berry Springs area, approximately 10 km from the project area. These are not depicted in Figure 3-1.

Within the project area, Partridge Pigeon was identified on seven occasions during field surveys (6 pairs and 1 individual). Four of the records were close together and are likely represent the same pair. All sightings occurred in the wet season within Vegetation Community 1 – *Eucalyptus tetradonta* and *E. miniata* woodland. This equates to approximately 2,040 ha of potential Partridge Pigeon habitat and can be considered the EOO within the site. The AOO is likely less because the species has meso-habitat preferences that are not fully understood by the scientific community, and so it is unlikely that entire area constitutes suitable habitat. In relation to that point, the occurrences of Partridge Pigeon within the project area does not correlate strongly with historic fire frequencies – as shown in Figure 3-2.

Given the project area's high historic fire frequency and lack of permanent freshwater, it was unexpected to record Partridge Pigeon onsite. The low number of Partridge Pigeon sightings – despite numerous site visits and comprehensive surveys – suggests that the site support only a few birds, and hence may constitute sub-optimal or fringe habitat. It is very unlikely the species persists year round because of the lack of onsite permanent freshwater. (The only perennial spring on the site was targeted by camera traps in the late Dry season and did not record the species.)

There is a vast area of similar habitat immediately to the east of the project area which extends east and south (see Figure 3-3). Much of this habitat has experienced a similar fire regime to that within the project area (see Figure 3-4) and so it is inferred that the also habitat supports Partridge Pigeon, and does so with a reasonable degree of homogeneity. As such, the records of this species within the project area should be considered members of the mainland sub-population, and not an isolated sub-population. Therefore, the 'regional population' (as referred to in the information request above) is the mainland sub-population. There is no 'regional population' or 'local sub-population' per se.

For species listed as Vulnerable – such as Partridge Pigeon – an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans and/or that are:

- Key source populations either for breeding or dispersal
- Populations that are necessary for maintaining genetic diversity
- Populations that are near the limit of the species' range.

None of these definitions apply to the Partridge Pigeon recorded within the project area because those individuals are considered to constitute a non-discrete, sub-set of the mainland sub-population. It is inferred that the population on the Noonamah Ridge site is contiguous with the mainland sub-population (because of the abundance of adjacent suitable habitat). In addition, despite numerous site visits, there were only 7 records of this species (of which possibly 4 are duplicates) for a species with an estimated mainland population of 115,000. If developed, approximately 20.4 km² of potential Partridge Pigeon habitat will likely be lost out of an EOO of 117,000 km². The loss of such a small area of habitat within the EOO is unlikely to cause a significant residual impact to the mainland sub-population of the species.

It is noted that the records of this species within the project area are the closest recent records to Darwin; however, their historic distribution to the north would never have extended much further due to the proximity of the natural boundary formed by the coast. Moreover, it is the severe range contraction from the western, eastern and southern parts of this species' former distribution (Higgins & Davies 1996; Woinarski et al. 2007) that have led to its decline – not from the north.

Therefore, the population of this species that utilises the project area is not considered 'important' (as defined in the *EPBC Significant Impact Guidelines 1.1*).

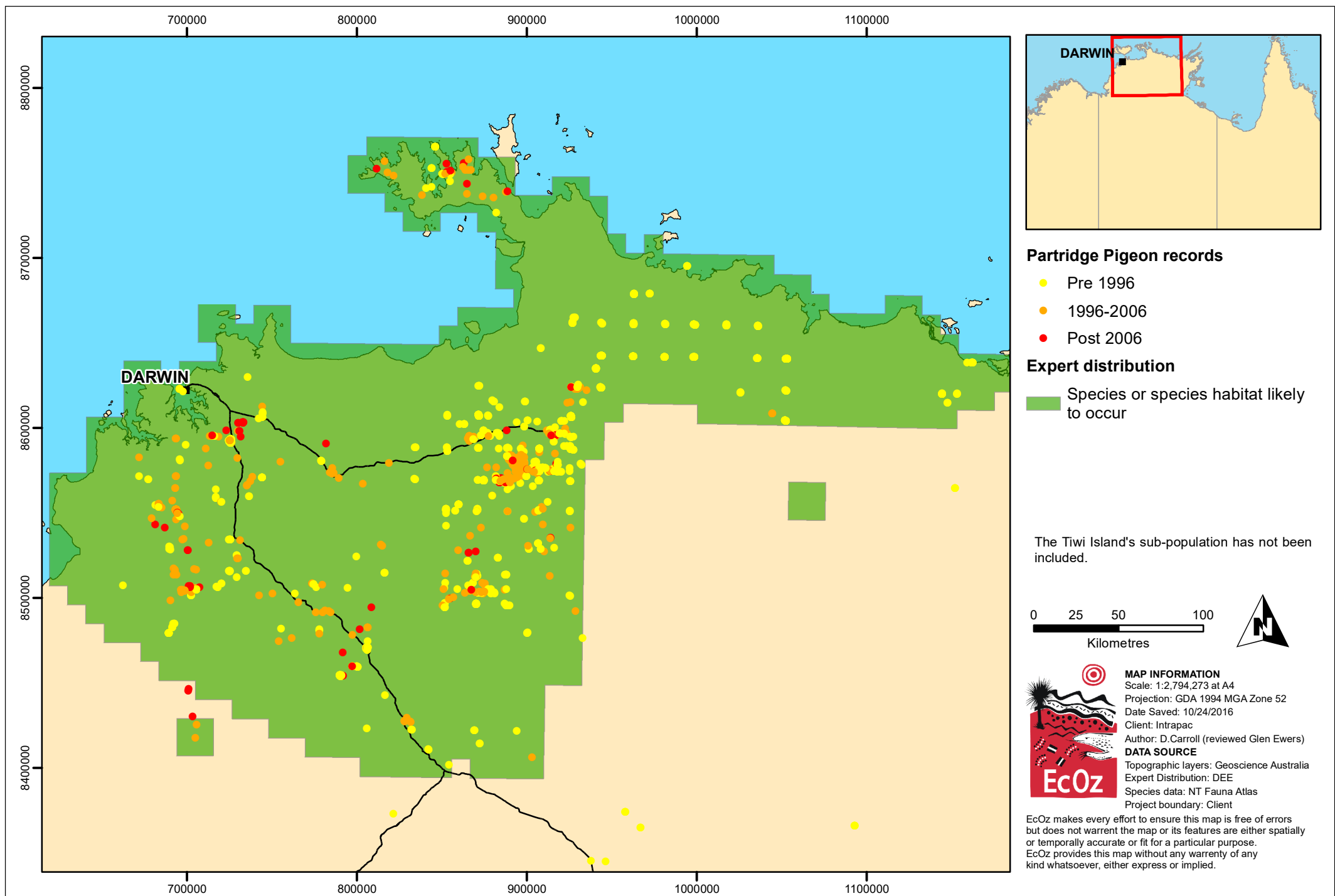
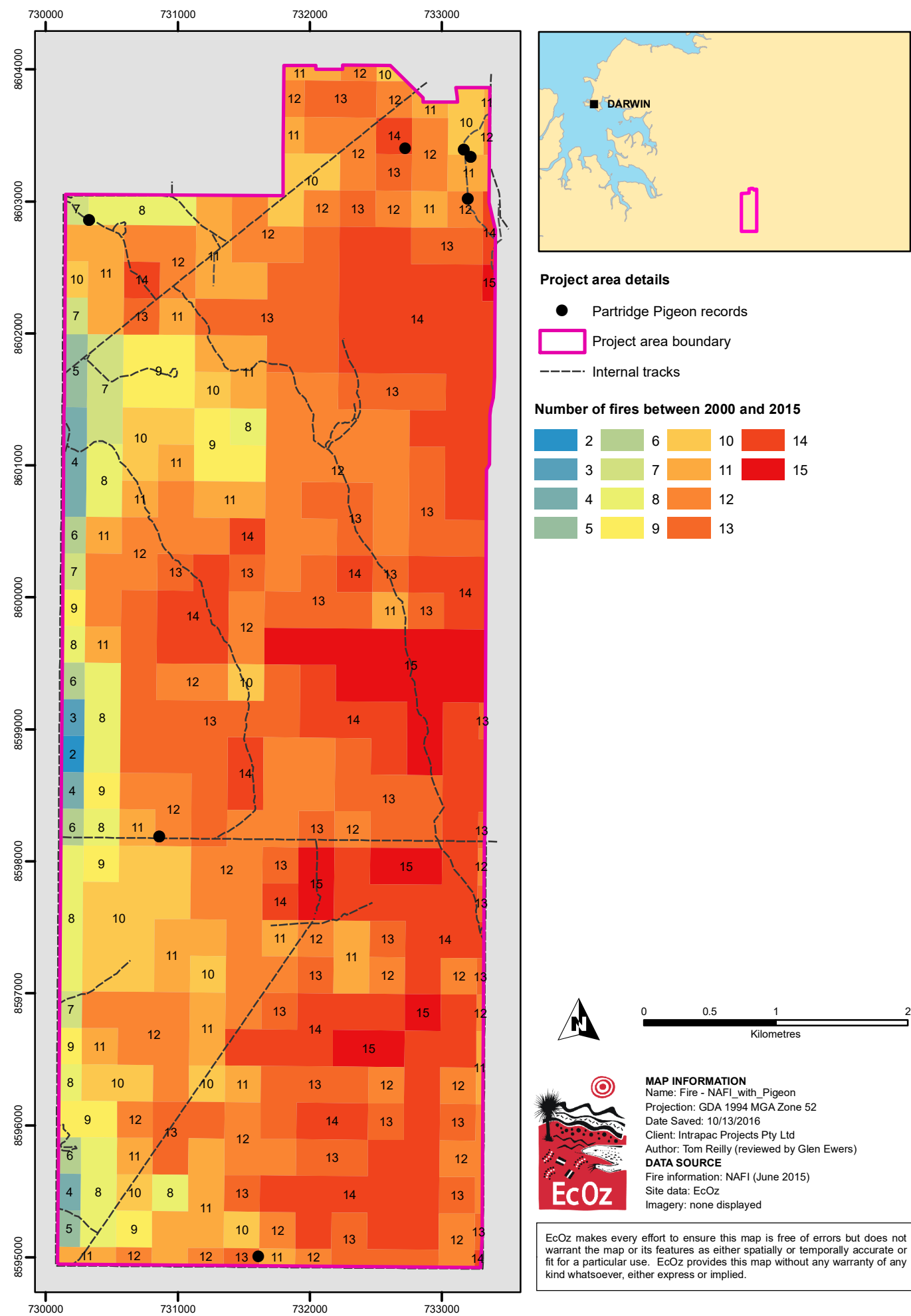


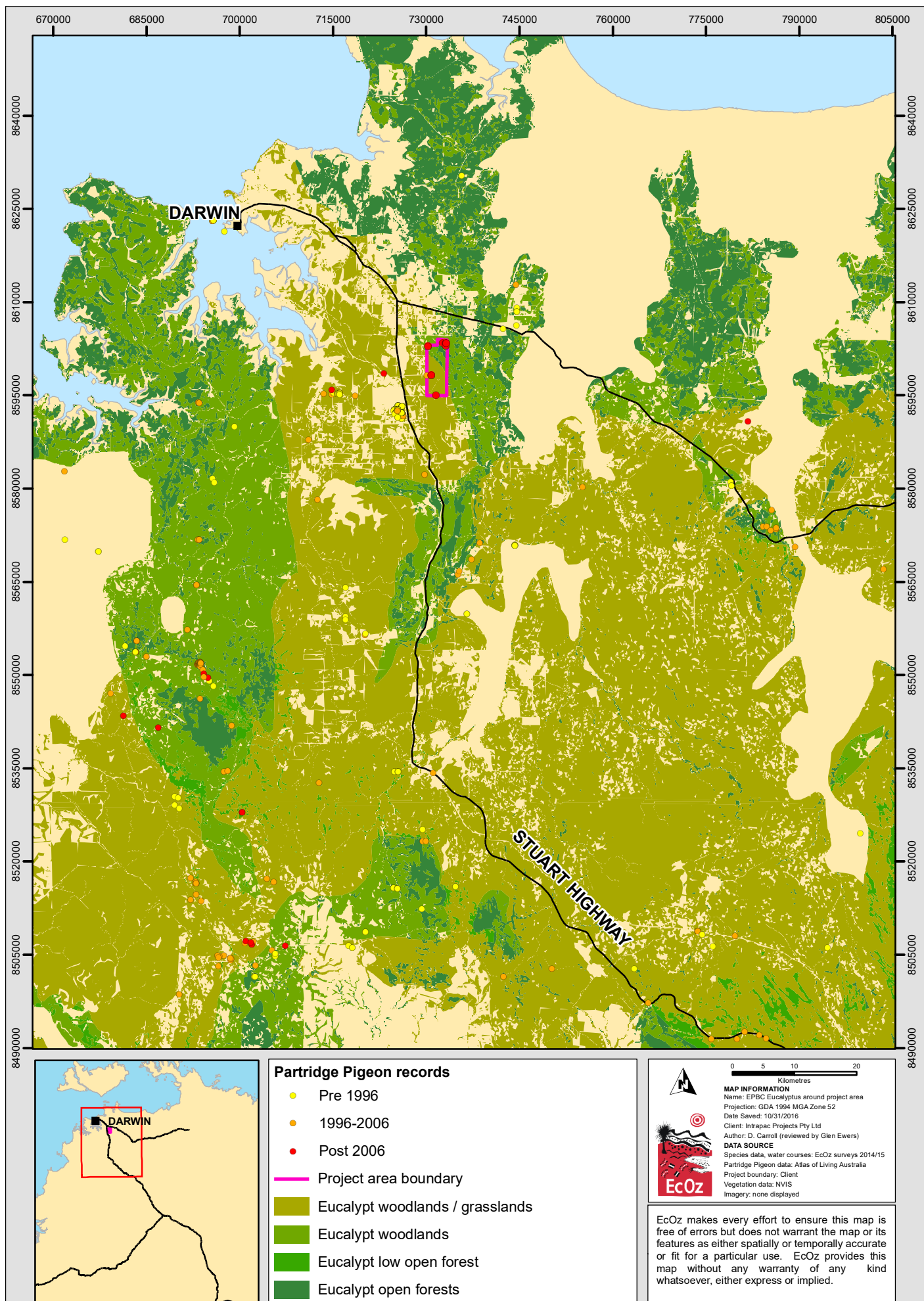
Figure 3-1. Map showing the expert distribution of the mainland sub-population of the Partridge Pigeon (and all accompanying records)

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Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\14400 - Noonamah Ridge Estates EIS\01 Project Files\EPBC Response\Fire - NAFI_with_Pigeon.mxd

Figure 3-2. Map comparing onsite Partridge Pigeon records and fire history (2001-2016)



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Figure 3-3. Map showing Partridge Pigeon records and suitable habitat within the region

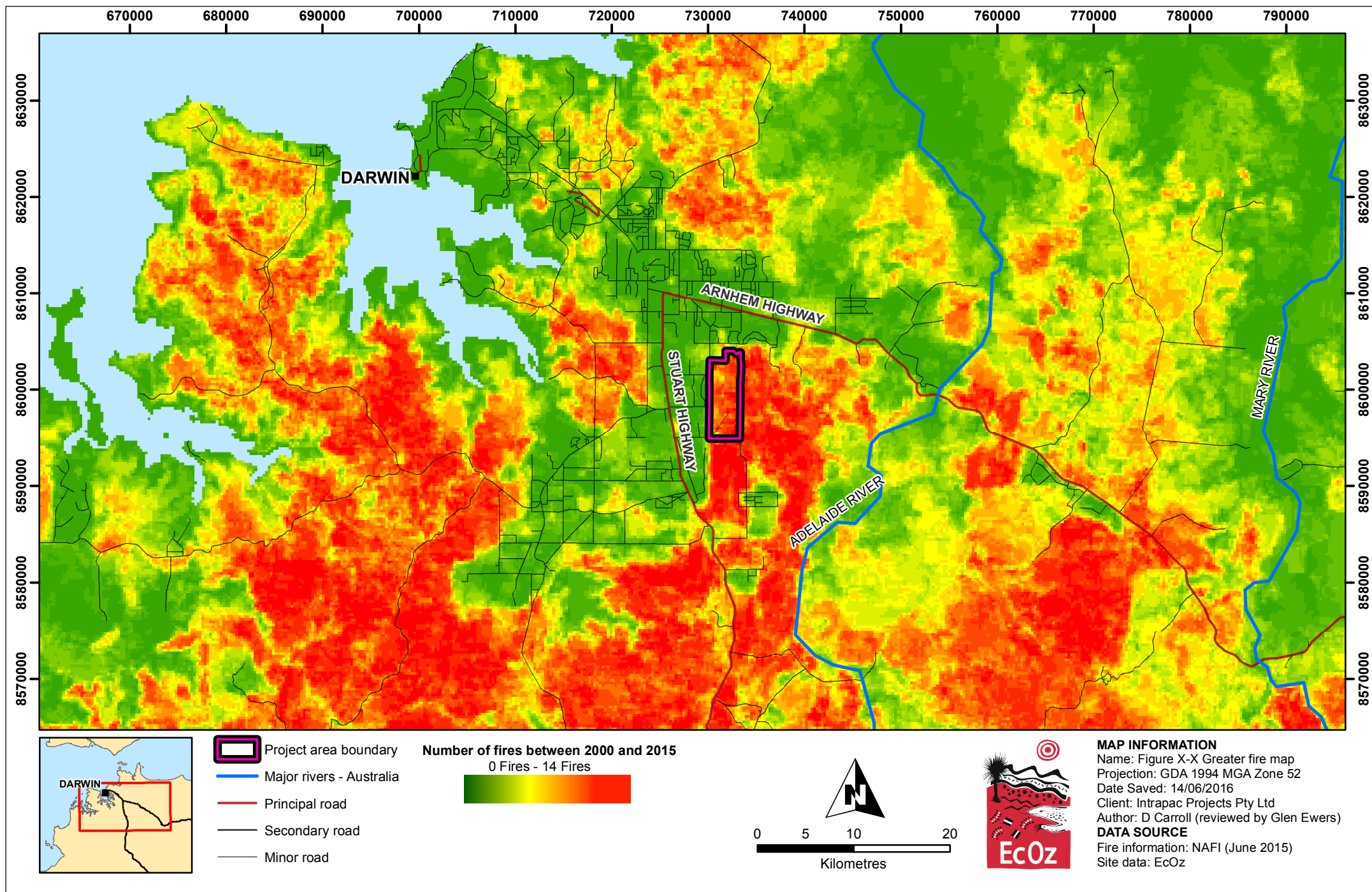


Figure 3-4. Map of regional fire history

3.2.2 Typhonium praetermissum

Request: There are a number of inconsistencies in the application of terminology and assessment of the significance for *Typhonium praetermissum*:

- The Supplement does not include the full known distribution of *T. praetermissum* across the Noonamah Ridge site. Without this, the importance of the defined 'populations' cannot be assessed.
- The delineated 'patches' of *T. praetermissum* have been identified as separate 'populations', without sufficient justification to support this definition. It is considered unlikely that the current delineated patches constitute separate populations. The definition of the *T. praetermissum* 'populations' in the development area is inconsistent with accepted guidelines used to assess threatened species.
- Conclusions on habitat quality for *T. praetermissum* have been made based on qualitative assessment, without describing the methods used for the qualitative assessment.
- A qualitative risk assessment method has resulted in a qualitative, cumulative score rather than individual quantitative assessment of each impact.
- The Supplement has not presented ongoing acceptable conservation and management solutions for this species.

The NT EPA requires:

- Presentation of all contemporary records of *T. praetermissum* so that the importance of the defined 'populations' in the context of the local area can be appraised objectively.
- Methods to define 'population' and 'sub-population' should be described, and must be consistent with the 'sub-population(s)' concept identified in the IUCN Criteria.
- Information on the qualitative categories that were used to assess habitat quality and how the conclusions were reached are required.
- All occurrences of this species should be incorporated into a buffered Zone CN network that informs the Planning Scheme Amendment for the site.
- The location of proposed roads, village and allotments relative to the location of all known Typhonium patches must be provided.

Response: *Typhonium praetermissum* is endemic to the Darwin-Litchfield region of the Top End. A comprehensive distribution and occurrence map for this species has recently been released by the Flora and Fauna Division of DENR – see www.ntlis.nt.gov.au/mpds/get_file?file_id=7085. According to that map, the EOO of *T. praetermissum* is considered to be 1,513 km², with an AOO estimated to be 88 km².

Prior to the surveys for this development, the species had been recorded at six locations – Gunn Point, Karama, Palmerston/Holtze, Virginia, Darwin River, Raft Point and Humpty Doo. Only a small number of populations have been found within these areas, and most are located in areas suitable for rural or residential development (Westaway & Cowie 2012). No populations occur within reserves. The paucity of records is likely, in part, an artefact of limited collection effort within the short window that this cryptic species is visible and identifiable. An example of this is the Holtze population that was recently discovered as part of surveys for a development.

Targeted surveys at Noonamah Ridge identified occurrences of *T. praetermissum* on a number of different land units that support *Eucalyptus tetrodonta* and *E. miniata* woodland. As shown in the DENR distribution and occurrence map for this species, within the project area there are aggregations of *T. praetermissum* in the north-west, north-east and south-west corners, with scattered records across the rest of the north and south

of the site. No occurrences were recorded across the centre of the site, indicating a gap between the northern and southern occurrences of approximately 3.3 km.

In the text accompanying the abovementioned DENR distribution map, it is surmised that the Noonamah Ridge northern and southern records represent two subpopulations of *T. praetermissum*. Although not stated, it is assumed that the term 'subpopulation' used in this case is consistent with that defined by the IUCN as 'geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange (typically one successful migrant individual or gamete per year or less)' (IUCN 2012). The species is pollinated by winged insects (David Liddle, DENR, pers. comm. 2016) and so such an assumption may be valid. Only genetic studies can verify if this is the case.

For species listed as Vulnerable – such as *T. praetermissum* – an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans and/or that are:

- Key source populations either for breeding or dispersal
- Populations that are necessary for maintaining genetic diversity
- Populations that are near the limit of the species' range.

The two subpopulations of *T. praetermissum* within the project area are both likely to be key source populations for breeding and/or dispersal, and hence are considered 'important populations'.

Many of the known, onsite occurrences will be contained within reserves – see Figure 3-6. For those that are not, Intrapac now proposes (as a result of discussions with DENR) to translocate any individual *T. praetermissum* into reserves that contain members of the same subpopulation. This will occur prior to each stage being developed. The procedure and timing for translocation will be developed in consultation with the NT Herbarium and DENR. Translocation of this species is expected to have a high likelihood of success based on the fact that in order to identify the *Typhonium* genus to species, botanists routinely dig up individual plants and grow them on to flowering in pots (Westaway & Cowie 2012). Recently translocation of this species from Holtze to the Darwin Botanical Gardens has been successfully undertaken.

Because Intrapac no longer proposes to clear any *T. praetermissum*, the assessment of habitat quality that is presented in the EIS, and mentioned in the NT EPA's information request above, is no longer relevant.

3.2.3 Armstrong's Cycad (*Cycas armstrongii*)

Request: The Supplement provided an assessment of the species potential habitat and the likely impact of the proposal upon potential habitat within what is assumed to be the Extent of Occurrence. The assessment suggests that 0.3 % of potential habitat will be removed as part of the development. However, the scale at which the potential habitat has been identified, and the proportion affected by the development is not appropriate for the actual distribution of the habitat (i.e. the identified habitat is not uniformly suitable for the species at the classification and mapping scale used). In addition, the Supplement does not account for variations in density across the species range, which is likely to be related to a finer scale delineation of potential habitat within the landscape.

The NT EPA requires:

- An assessment of the species Area of Occupancy within the Extent of Occurrence needs to be provided to assess the significance of the *C. armstrongii* population on Noonamah Ridge. The assessment needs to identify the areas of highest likelihood of occurrence and/or those sites within the landscape with particularly high densities of *C. armstrongii*.
- Areas of higher density of *C. armstrongii* could be incorporated into the Zone CN network that informs the Planning Scheme amendment for the site.

Response: Figure 3-16 of the SEIS provides an indication of the Area of Occupancy of *Cycas armstrongii*, using Eucalypt woodland and forest spatial data as a surrogate. It is acknowledged that the density of this species within that area varies, as it does within the Noonamah Ridge project area. However, as can be seen, the occurrence of *C. armstrongii* within the project area is centrally located within the mainland population's Area of Occupancy. The suitable habitat for this species within the project area is contiguous with large areas of suitable habitat immediately surrounding most of the site. The occurrence of *C. armstrongii* at Noonamah Ridge, therefore, is unlikely to contribute significantly to the species' genetic diversity or to constitute a key source population either for breeding or for dispersal. Moreover, the project area is within the heartland for this species, rather than being the limit of its range. For these reasons, the population of *C. armstrongii* within the project area is not considered necessary for the species' long-term survival and recovery, and therefore is not an 'important population'.

Because of its rural character, the Noonamah Ridge development does not involve broad scale clearing of the entire site. As is the case in much of the existing rural area, a significant proportion of the project site will retain remnant vegetation that supports *C. armstrongii*. Some of this will be included in reserves zoned for conservation (see Section 3.5), but most of it will be on private land. Land clearing on individual lots will be governed in accordance with the *NT Planning Scheme*, which contains standard land-clearing requirements for lots 2 ha and larger – namely Clauses 10.2 and 10.3, as well as the *Land Clearing Guidelines* (DNRETAS 2010). For lots smaller than 2 ha, a new clause will be incorporated into the *NT Planning Scheme* (through a Planning Scheme Amendment specifically for the Noonamah Ridge area), requiring land-holders to obtain a permit to clear more than 1,000 m² of native vegetation (exclusive of the assigned building envelope).

In addition, in line with the principles of ecologically-sustainable development underlying this project, Intrapac is committed to retaining native vegetation – and particularly *C. armstrongii* – where possible in public land (e.g. when landscaping parks, public open spaces, roadside verges etc.).

Together, these measures will all ensure the persistence of *C. armstrongii* across the project area and support the genetic diversity that occurs there.

3.2.4 Sandsheet heath species

Request: Comments on the draft EIS identified concerns around claims that the existing hydrology and water quantity of the sandsheet heath areas would be maintained in the context of the significant changes to the catchment. The hydrological report of the Supplement dealt exclusively with surface water inputs to the identified *U. daviesae* habitat but explicitly excluded investigating groundwater sources. This approach is not supported by the NT EPA. The NT EPA considers that sandsheet heath wetlands and associated *U. daviesae* habitat, and *Cleome insolata* habitat are groundwater dependent ecosystems. The nationally accepted definition of groundwater dependent ecosystems includes ecosystems that may rely on the surface expression of groundwater, including all the surface water ecosystems which may have a groundwater component, such as rivers, wetlands and springs as well as ecosystems that may rely on the subsurface presence of groundwater, including all vegetation ecosystems.

Appendix B acknowledges that significant uncertainty remains in calibrating the models used to derive the findings due to a lack of on-site monitoring. This uncertainty and the nature of shallow groundwater movements in the local catchment need to be resolved to enable an accurate assessment of impacts on *U. daviesae* habitat.

The NT EPA requires:

- Detailed information describing how a continuing adequate supply of water will be maintained. Such a supply needs to be sufficient to maintain soil moisture and surface water conditions of the sandsheet heath habitat, and thus allow the significant *U. daviesae* and *C. insolata* sub-populations in this area to be maintained.

Response: Sandsheet heath is characterised by acidic infertile soils (usually sand) overlaying an impermeable deposit of clay or laterite (according to the relevant *DENR Sensitive Vegetation Fact Sheet*). The impermeable layer causes the soil to become water-logged in the Wet season by both incident rainfall and subsurface lateral flows through the soil in adjacent areas within the catchment. The nationally-accepted definition of a 'groundwater-dependent ecosystem' (GDE) is a broad one, under which sandsheet heath qualifies because it is a wetland that is dependent on subsurface and/or surface influx of groundwater for all or part of the year. It is important to note, however, that because an impermeable deposit of clay or laterite underlies sandsheet heath (Doyle 2001), it is unlikely that this vegetation community benefits from the surface or subsurface expression of groundwater from a seasonally-rising watertable (i.e. from an aquifer). Sandsheet heath is arguably more accurately described as an 'inflow-dependent ecosystem'.

Intrapac is committed to not altering the hydrology of the sandsheet heath in the north-west corner of the project area. There are three potential sources of the water required to maintain the habitat and its values:

- Groundwater from an aquifer. As discussed above, a rising watertable is not a likely source of water for sandsheet heath. Nevertheless, as discussed in Section 3.4.2 of this document, groundwater extraction for the development will likely occur within the centre of project area along the main fault. This is at least 2 km from the sandsheet heath and so will not impact upon the hydrology of that habitat type. There are existing private supply bores to the north and west that are within 1 km of the sandsheet heath.
- Surface water and/or sub-surface flows from the creek to the south. The hydrologists report presented in Appendix A of the SEIS concluded that the horizontal and vertical separation distance of the toadlet habitat from the creek is large enough to eliminate the possibility of regular inundation of the sandsheet heath by seasonally-occurring flows of that creek.
- Incident rainfall and sub-surface flows from adjacent areas. As discussed above, this is the likeliest source of hydrology for the sandsheet heath. The position of the sandsheet heath immediately downstream of the north-east catchment outlet suggests that the habitat receives subsurface lateral flows from this catchment. The general aspect of local topography – together

with shallow gradients – are likely to promote the dispersal of outflow across the hill slope and the sandsheet heath. In tandem with incident rainfall, it is surmised that these seasonal outflows provide sufficient water to maintain the regular, wet season inundation of the sandsheet heath.

The catchment of these flows was inferred by the hydrologist using available contours data (see Appendix A of the SEIS). To the extent that that catchment occurs within the project area (approximately 43 % of it is contained within adjacent private property), most of it will be contained within conservation reserves. The development is not expected, therefore, to cause significant changes to the catchment. Therefore, an adequate supply of water to the sandsheet heath will continue to be maintained.

3.2.5 Management

Request: Ongoing management of the SU zoning requires clarification. The Supplement referenced a 'responsible authority' as the entity to which final approval of green space and land-use decisions would fall. It is unclear who this entity would be and how the administrative arrangements would be implemented. There is potential ongoing risk associated with the management of these areas that may necessitate monitoring, compliance and enforcement of the provisions of the SU (and future alternative zonings) in relation to the conservation of significant biodiversity values. Without these arrangements being finalised, the ongoing effectiveness of these arrangements and therefore their ability to significantly mitigate the risk to threatened species cannot be assessed.

The NT EPA requires clear commitments and undertakings in the proposed planning scheme amendment are provided which ensure that the ongoing conservation and management of threatened species and significant habitats is guaranteed as part of the proposed development.

Clear justification as to why important subpopulations of threatened species and identified significant habitats for these species have not been proposed to be zoned as Conservation (CN) areas.

Response: Intrapac is committed to the protection and enhancement of the natural environment as a key component of Noonamah Ridge. As detailed in Section 3.5, all land that is identified as having significant conservation values is contained within an identified buffer area or is critical to the conservation of threatened species will be rezoned to Conservation, as part of the zoning normalisation process outlined in Section 2.2.

The term 'responsible authority' was used to account for general changes to department names that occur from time to time with Government restructuring. In broad terms, the various responsible authorities will be:

- For **Public Open Space**, Litchfield Council in accordance with the requirements of the *Local Government Act*.
- For **Conservation Land**, a variety of approaches exist, and will be determined by the intent behind zoning as Conservation each portion of land. For example, general buffers along creek lines may be appropriate to incorporate into private property, where a portion of the site is zoned conservation (as is currently the case across the rural area) and the balance zoned for an appropriate residential zone.

Where land is required for the **active management or conservation of a threatened species**, the conservation land could be handed over to the Northern Territory Government or a specific conservation body/organisation. Alternatively, Intrapac may elect to retain ownership and establish a perpetual funding stream through, for example, a special levy. The specific approach will be determined on a case-by-case basis during the staged subdivision process, in consultation with DENR. The environmental commitments within the EIS reflect this intention (see Appendix A of this document).

Active, ongoing management of the threatened species within some of the land zoned as Conservation will be required. That will mostly involve weed and fire control (informed by site-specific management plans), coupled

with monitoring of the threatened species in question. The specifics relating to the facilitation and funding of these activities will be the focus of the above-mentioned, case-by-case, consultation with DENR.

As detailed in Section 2.1, the intent is that the environmental commitments arising from the EIS be incorporated into the *NT Planning Scheme* as a reference document. As such, it will be mandatory that each subdivision application address the environmental commitments, and further that the Development Consent Authority take them into consideration. This process will also allow the NT EPA and DENR to impose conditions of approval relating to conservation management on any subdivision permit as a condition precedent that requires clearance before commencement of works.

3.3 Biodiversity

3.3.1 Wildlife corridors

Request: The conclusion that the development area does not provide/maintain connectivity between the Adelaide River and areas to the west is not supported by the NT EPA. The proponent has not provided any detailed assessment of movement requirements of at-risk species as part of an assessment of connectivity within and across the development area, apart from acknowledging that Black-footed Tree-rats may use riparian areas as seasonal corridors.

Previous advice from the Department of Land Resource Management has highlighted the appropriateness of including defined wildlife corridors between important areas within the development footprint and externally to adjacent areas of habitat to mitigate risk. This has included identified tracts of land through which retention of intact native vegetation as Zone CN areas could contribute to the maintenance of connectivity through the broader landscape. It is recommended the following wildlife corridors are considered:

- a) connect the two Environmental Investigation Area's in the north via the drainage line
- b) connect the central-northern Environmental Investigation Area to the heritage area near the eastern boundary of the project area
- c) extend south-east from the central-northern Environmental Investigation Area, following the general line of the proposed "open space" to Alverly Road, then to the eastern boundary of the project area south-east of Alverly Road.

To function effectively as wildlife corridors, these should retain a minimum of 200 metres width of natural vegetation (exclusive of other "open space" facilities such as ovals, surface water retention ponds, or schools etc.).

To mitigate the regional impacts of the development on biodiversity, it is requested that wildlife corridors are incorporated into the Planning Scheme Amendment and masterplan.

Response: As mentioned in Section 3.2.3 of this response, because of its rural character the Noonamah Ridge development does not involve broad scale clearing of the entire site. Just as is the case in much of the existing rural area, a significant proportion of the project site will retain remnant vegetation that will support most existing biodiversity values. Some of this will be included in reserves zoned for conservation (see Section 3.5 and Figure 3-6), but most of it will be on private land. This includes the many steep ridges running through the project site that will likely not be developed, and which will effectively operate as wildlife corridors for many species; as will contiguous large blocks.

With regards to the three wildlife corridors requested above:

- a) Intrapac is committed to retaining and buffering by 50 metres the riparian vegetation surrounding the main drainage line along its entire length through the property, thereby linking the conservation values identified in the two Environmental Investigation Areas in the north of the project site. For the reasons

presented in Section 3.2.5 of this response, this land will be zoned Conservation once lot normalisation occurs.

- b) Intrapac may consider a corridor linking the central-northern Environmental Investigation Area to the heritage area near the eastern boundary of the project area, but does not consider this to be a justified conservation priority.
- c) Although only a short distance, extending the corridor described in point a) to the eastern property boundary will be problematic because that includes the Alverly Road corridor which is NT Government land and is therefore not under the influence of Intrapac. It will be difficult to reconcile the requirements of a wildlife corridor with those of a major arterial road.

Finally, for the record, previous advice from DLRM was only about corridors with regards to Black-footed Tree-rats, which was addressed in the SEIS.

3.4 Groundwater

3.4.1 Water supply

Request: The proposed development overlies two aquifers: the Acacia Gap Quartzite and Whites formation. Whites formation is fully allocated, and no further bores will be permitted in this formation. It is understood that a Water Extraction Licence under the *Water Act* to take water from the Acacia Gap Quartzite, a sub-unit of the Wildman Siltstone Aquifer, is currently being considered.

The NT EPA requires:

- information on the proposed water sources to service the proposed development, and any agreements, licences and/or approvals that will be required. The servicing requirements for the entire proposal (various stages of the development) should be provided and not restricted to stage 1.

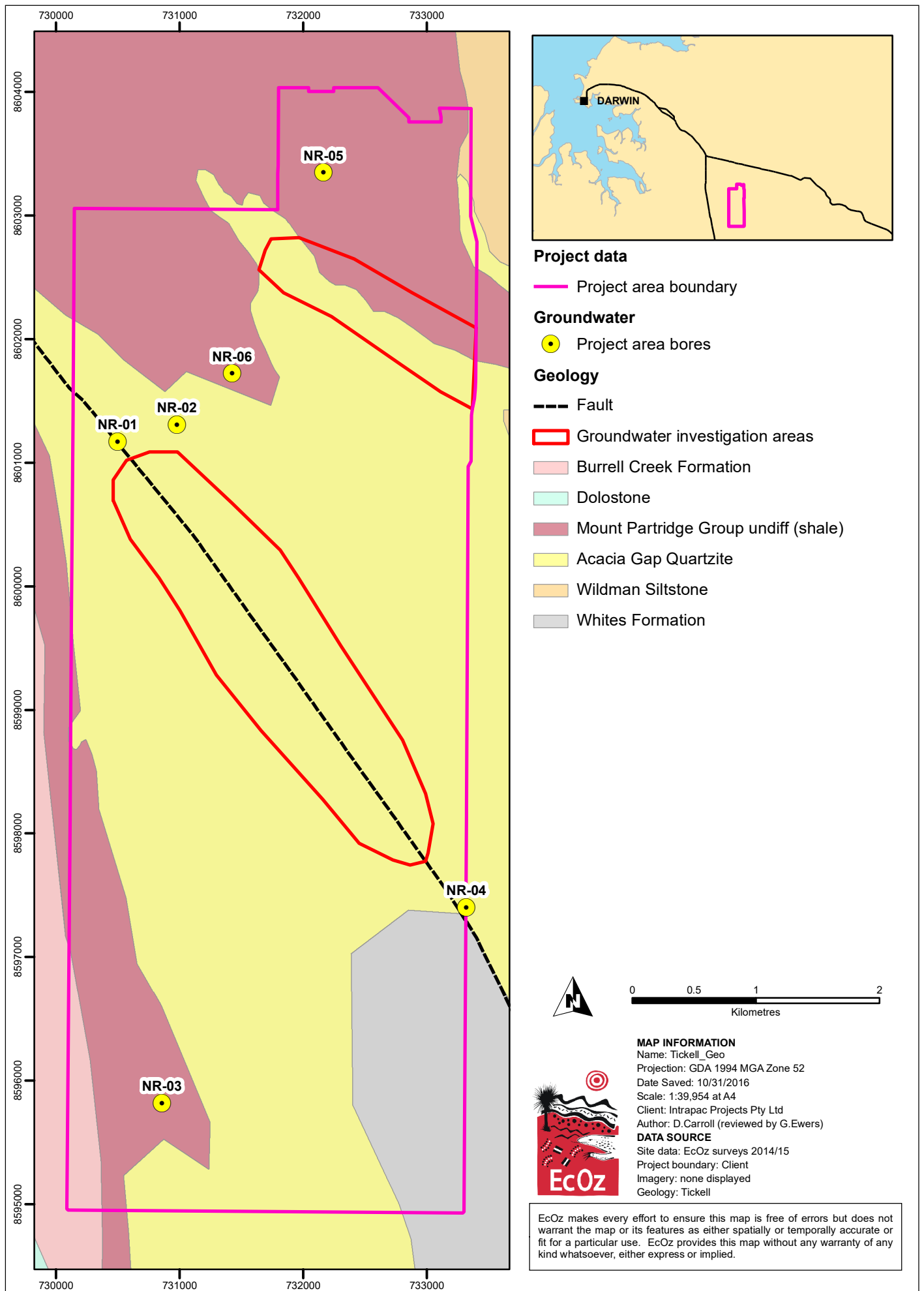
Response: Recent mapping of the regional aquifers confirms that Noonamah Ridge lies predominantly over the Acacia Gap Quartzite, with the south-eastern corner of the project site over the Whites Formation, and the northernmost area of the project site over the Mount Partridge Group – see Figure 3-5.

Prior to the approval of each subdivision, Intrapac will have to demonstrate to the Controller of Water Resources (as well as PWC and Litchfield Council) that there is sufficient potable water to supply the new subdivision without affecting the supply to existing users and/or the environment. Investigations to date indicate there is sufficient groundwater available onsite to sustainably meet some of the development's potable water requirements (including all of Stage One). Therefore, Intrapac has applied for a Water Extraction License to extract 571 ML/yr. If approved, Intrapac will be responsible for the installation and monitoring of a borefield to supply the development with water extracted from onsite aquifers.

When the development reaches a size such that the onsite groundwater supply of potable water needs be supplemented, Intrapac propose to install and monitor a borefield that extracts groundwater from an un-utilised part of the Koolpinyah aquifer to the east of the project site (see Section 3.4.3).

In addition to the abovementioned licensing requirement, Intrapac will need the permission of the landowner of Koolpinyah Station in order to investigate and extract the resource beneath. That will be a formality, given that the owner of Koolpinyah Station is also a joint venture partner in the Noonamah Ridge development.

Intrapac has also applied to the Utilities Commission for a license to become a water utility retailer. If successful, Intrapac will be required to adhere to the conditions presented in section 42 of the *Water Supply and Sewerage Services Act*. Further information on becoming a water utility is contained in the [Licensing Manual for Water and Sewerage Services in the Northern Territory](#) (2001).



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Figure 3-5. Map of aquifers relevant to the development & of areas that will be targeted for groundwater studies

3.4.2 Sustainability

Request: The Groundwater Sustainability Report (Appendix B) is essentially a bore test analysis report, which provides information on how the bore will be expected to perform to deliver a water supply and for pump sizing. Footnote 2 on page 4 of the Report expresses limitations with the data. This analysis does not provide the quantitative information required to establish sustainability of the groundwater resource or the risks to sensitive environments/existing users.

The NT EPA requests that you provide the following information:

- baseline monitoring of the water resource to assess resource behaviour and response to rainfall, with the aim of quantifying recharge
- justification for the number and locations of the bores used to inform the studies and the suitability of the locations in relation to geological features, potential yields and long-term sustainability of the resource
- a proposed monitoring scheme designed to inform of possible impacts to identified environmental assets and sensitive environments/existing users
- an assessment of the groundwater flow regimes on the site to establish the degree of surface water / groundwater connectivity
- an assessment of the impacts of drawdown on groundwater dependent ecosystems and existing users

Response: The sustainability of greater Darwin's groundwater extraction has recently come under increased scrutiny, with the effect that stricter licensing requirements have been introduced. As a consequence, current and future applications by Intrapac to extract groundwater for use in Noonamah Ridge will be assessed with unprecedented rigor to ensure the volumes to be extracted are sustainable. For this reason, and because Intrapac is committed to the principles of ecologically-sustainable development, a thorough groundwater investigation will be undertaken prior to production, as described below.

Six bores were drilled across the project area to inform the EIS. Three of these were located in zones aligned to the Noonamah Fault that could be expected to have some fracturing, as deduced from observations of aerial imagery and from geophysical data. Those bores are highly productive and have very good quality drinking water. They were pump-tested and the results indicated free-running aquifers (as can be expected in fractured aquifers) and negligible drawdown (which could be the result of either high connectivity within a modest resource or a significantly larger resource). During pump-testing there were no nearby monitoring bores to test local drawdown.

The three other bores were located in a more random manner in order to give a clearer picture of groundwater across the project area. These have low productivity.

The aquifers within the project area are not the standard Cretaceous and/or dolostone aquifers found in the Darwin region – instead being of a fractured nature, with the fractures probably linking and opening up porous and semi-porous lithologies.

Standing water levels for all bores were measured in June 2015 and September 2015 and, in all cases, there was only a very modest depression of water levels. This would be the result of transpiration and some groundwater flow out of the area to lower elevations. It is thus unlikely that there is significant connectivity with existing bores on neighbouring properties.

The six bores have provided some insight into the groundwater resource, but further work needs to be done to adequately define the resource. The initial focus will be on investigating a resource that can supply the first few stages of the development, and therefore will target the postulated strike of the sandstone along which the

productive bores lie (see Figure 3-5). The targeted area starts at approximately 750 m from the nearest property to the west, and extends away to the south-east.

In preparation for the 2016-17 wet season, loggers were installed on all existing bores to monitor water levels and, in particular, to monitor reaction to rain events and thus gain insight into local recharge characteristics. Moving forward, the investigation proposed by Intrapac's consulting hydrogeologist is that:

- At this stage, up to eight additional investigative bores will be install within the target area along the postulated strike of the sandstone (as depicted on Figure 3-5). Owing to the fractured targets, more than one attempt at drilling in the vicinity of a location may be required. These bores will all have loggers installed after completion.
- Some of the additional bores will be pump-tested for longer time periods than previously done to attempt to define the limitations of the aquifers. Previous pump-testing did not show any real drawdown and recovery times were extremely rapid, so longer pump tests are expected to provide better data. The proposed bores are located well away from any relevant GDE's and existing offsite bores (i.e. kilometres away, for the most part), and so would be unlikely to have significant connectivity with outside users. A monitoring bore will likely be installed in between the proposed bore-field along the strike and the properties to the west of the project area to identify if they are connected.
- These bores would be the minimum required in order to obtain a sufficient understanding of the resource. Further monitoring bores may be required to monitor drawdown, both at the pump-testing stage and long term.

For further stages of the development, in the north of the project site a north-west trending strike postulated from a variation in magnetic signature and aerial imagery may be investigated (see Figure 3-5). As discussed in Section 3.2.4, the sandsheet heath in the north-west corner of the project area is not aquifer-dependent and so will not be affected by groundwater extraction.

3.4.3 Koolpinyah aquifer

Request: The Supplement notes that additional studies still need to be undertaken to assess the viability of the Koolpinyah aquifer to supply further stages. It is understood that this aquifer has yet to be targeted for studies to define the water resource and the potential viability/sustainability. The NT EPA requires additional information on the proposed program to target the Koolpinyah aquifer and contingencies if sufficient waters are not able to be sourced from the Koolpinyah aquifer. The information should also include the social, economic and environmental consequence.

Response: This potential resource is considered to be a southern lobe of the Koolpinyah Dolomite formation and at present is not being utilised. It is very under-explored, and so Intrapac propose to undertake a desk-based investigation leading to an exploratory program. This program would consist of at least four targeted exploratory bores with automated loggers which would be pump tested, and the draw-down and connectivity evaluated. If the targeted bores are unsuccessful, then further exploratory bores would be drilled in the vicinity of the targets. There may be a need for some monitoring bores to evaluate drawdown during pump testing and for long term monitoring.

As this potential resource is probably of the classical Darwin region Cretaceous and dolostone aquifer type, there is less emphasis in the proposed exploratory program on structural detail, and more on determining the areal extent of the resource. Therefore, bores would be located at reasonable distances from one another.

3.5 Green space

Request: Chapter 2.3.4 of the final EIS provides a brief description of the greenspace network in the Project area. It is proposed that 15 % of the area is made up of open space, which is split into 'natural open space' and 'open space area active +passive' (Figure 2-7). It is unclear what is defined as natural open space and open space area - active +passive. It is not clear what activities are proposed for which parts of the greenspace network.

The NT EPA requires a map which clearly identifies the following:

- areas of natural open space that have been set aside for conservation reasons (threatened species, sensitive vegetation, required buffers, heritage, etc.)
- areas of open space identified for infrastructure (sediment basins, lakes, etc.)
- areas of public open space that will be used for recreational purposes (playgrounds/fields, BBQ/picnic facilities, public artwork, cycling tracks, etc.)

A breakdown of the types of open space (in hectares) proposed for the development and outline the types of activities that will be undertaken or in those areas is required.

Response: Within the planning approvals' process, this development is currently at the rezoning stage. It is typical that the level of detail at rezoning stage is less than is required for a subdivision application. The rezoning approval provides the certainty to the developer that the development can proceed, and therefore represents the stage at which it is appropriate for the developer to incur the substantial costs associated with the detailed planning, design and environmental works.

Mindful, therefore, of the early conceptual stage this development is at, outlining the exact extent of land to be zoned Conservation. It is not possible to provide a map or per-hectare breakdown of this at this early stage. Instead, an indicative map of land to be zoned Conservation is presented as Figure 3-6. Open space will be broken down into the following broad categories, which will be determined by the relevant conservation values or the intent of the open space at detailed subdivision design stage:

- Land requiring active management because it is identified as having significant conservation values or is critical to the conservation of threatened species will be zoned CN (Conservation), and will be subdivided in its entirety into a lot that can be handed over to a conservation management body (to be established), the Northern Territory Government, or Litchfield Council.
- Land containing environmental buffers (such as along creek lines), but not requiring active management, may be incorporated into larger allotments and sold as freehold. These lots will have a split zoning – where the land containing the environmental buffer is zoned CN (Conservation), and the balance is zoned a relevant residential zone, such as RL (Rural Living).
- Public Open Space will be provided at the rate required under the *NT Planning Scheme* (and where this formal / active open space does not include conservation land), and would be zoned PS (Public Open Space). This will include areas such as sports ovals and formal recreation.
- Land set aside for stormwater management may fall in land zoned for CN (Conservation); however, it will not include land set aside for active management of threatened species. Further, as per existing *NT Planning Scheme* provisions, only 15 % of land used for stormwater management will count towards the required provision of Public Open Space.

As discussed in Section 2.1, the appropriate time to define the open space network to that level of detail is after the detail survey and groundwork that will be undertaken to inform the subdivision design. This is particularly true in determining the land required for stormwater management, which will require detailed

modelling based on the road layout design, relevant density, and the characteristics of the respective catchment.

To provide DENR and the NT EPA with certainty that this information will be made available, and to give those authorities the opportunity to assess the map, the request for the map will be included into the SEIS environmental commitments (see Appendix A of this document) that will be incorporated into the *NT Planning Scheme* as a reference document (as explained in Section 2.1).

A high level, open space framework will be provided as part of the master plan to be submitted with the first stage subdivision application. Each stage of subdivision will provide a detailed open space breakdown, and outline of land to be set aside for conservation purposes.

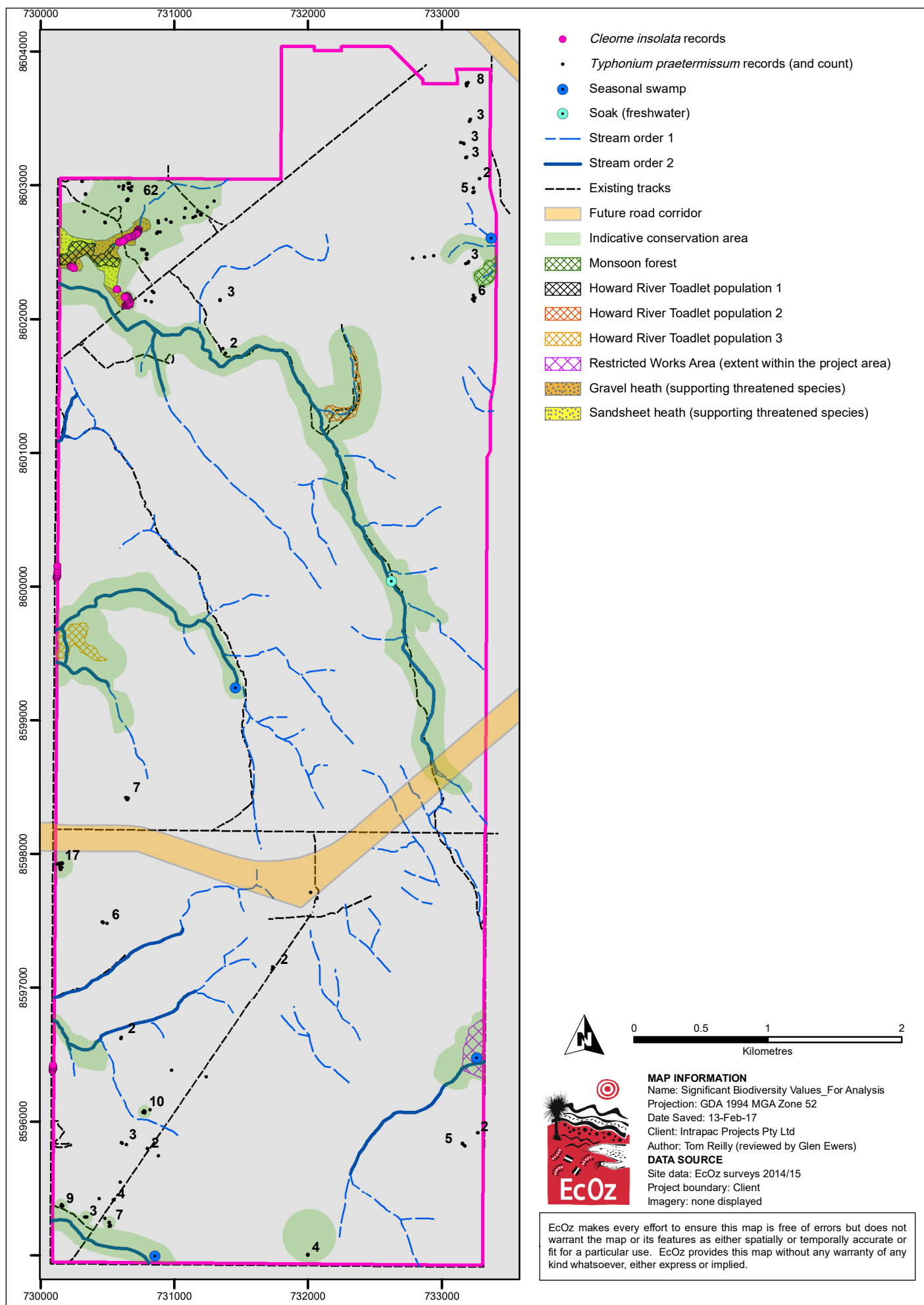
Request: Green space and important habitat areas Intrapac have proposed that the primary mechanism to conserve significant biodiversity values in the project area in the long-term is by creating the network of 'green space' identified in the Area Plan and the Special Use (SU) zoning text for the Noonamah Ridge development. Comments have previously highlighted the insecurity around the ongoing zoning and management of 'green space' areas (including both Open Space and Environmental Investigation Areas) as a significant potential risk to identified biodiversity conservation values. This was particularly relevant to identified sub-populations of threatened species known to occur within these areas.

Furthermore, the proponent states that "All conservation-significant values identified in Section 3.9 are contained within the green space network." (see 2.3.4 Green Space, page 2-19). This statement is not consistent with the maps provided in the Supplement (Figure 5-7). The figure shows that sensitive vegetation types and significant threatened fauna records have been excluded from the area mapped as 'green space'.

The NT EPA requires a revised conceptual masterplan map which demonstrates Intrapac's commitments.

Response: Section 3.2.5 provides a response to the concerns expressed in the first half of this information request regarding the ongoing zoning and management of green space areas.

Section 3.9.1 of the EIS defines what are considered the 'conservation-significant values' within the project area; these are listed in Section 3.9.5. The indicative green space network presented in Figure 5-7 of the SEIS incorporates all of these values (although it is acknowledged that, being indicative, the figure does not exactly match up with the boundaries of some sensitive vegetation communities). As discussed in the response to the preceding information request, a high level, open space framework will be provided as part of the master plan to be submitted with the first stage subdivision application. Each stage of subdivision will provide a detailed open space breakdown, and outline of land to be set aside for conservation purposes.



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ14400 - Noonamah Ridge Estates EIS\01 Project Files\Significant Biodiversity Values_For Analysis.mxd

Figure 3-6. Map (indicative) of conservation areas within Noonamah Ridge

3.6 Wastewater treatment

3.6.1 General

Request: Section 2.10.3 of the Supplement describes the proposed wastewater management systems to be installed at the development. The draft EIS and Supplement provide no detail about the range of allotment sizes that will be connected to community scale wastewater treatment plants.

In your response, outline the range of allotment sizes that will be connected to the community scale wastewater treatment plants. Will allotments greater than 4000 m² be connected?

Response: Noonamah Ridge proposes to have lots sizes ranging from 1000 m² up to 20,000 m². All lots less than 20,000 m² will be connected to the wastewater system where possible. Some larger lots and the 20,000 m² lots will be too far away from a treatment plant and will instead use individual or shared wastewater systems, in line with the capabilities of the land (as determined through Land Capability Assessments – see Section 3.6.2).

3.6.2 Siting of wastewater infrastructure

Request: The Supplement outlines the Proposed Wastewater Management Strategy for community scale systems and mapped the indicative sewerage reticulation and wastewater treatment sites. The siting of wastewater infrastructure in its current form is inconsistent with the Land Suitability Assessment, with the indicative locations on land identified as S4 or not suitable. The siting of Wastewater Treatment Facilities and infrastructure on land that is unsuitable can result in ongoing risks to the environment.

The NT EPA requires clarification about the locations of the indicative sewerage reticulation, wastewater treatment sites and proposed irrigation sites in consideration of the Land Suitability Assessment. Where there are potential inconsistencies or overlaps, they should be identified and a justification provided for site suitability.

Response: Within the planning approvals' process, this development is currently at the rezoning stage. It is typical that the level of detail at rezoning stage is less than is required for a subdivision application. The rezoning approval provides the certainty to the developer that the development can proceed, and therefore represents the stage at which it is appropriate for the developer to incur the substantial costs associated with the detailed planning, design and environmental works.

Mindful, therefore, of the early conceptual stage this development is at, outlining the exact location and nature of wastewater treatment plants is not possible. However, it can be said that the risk that wastewater treatment systems will be located on unsuitable land is negligible. This is because the planning approvals' process requires detailed, site-specific Land Capability Assessments to be performed for all proposed wastewater treatment and effluent disposal sites to confirm land suitability – including both individual systems for large lots and community-scale wastewater treatment systems. The sites nominated for wastewater treatment plants within the SEIS are aligned with low-lying areas in each sub-catchment in order to take advantage of gravity flows throughout the expected sewer reticulation network.

As noted in the SEIS, the mapped locations for wastewater treatment systems are indicative only, and will be refined during design development to ensure the systems are operating within land capabilities. The exact locations for wastewater treatment systems cannot be accurately stipulated until future site investigation works and design development is undertaken. However, the project area is very large and the majority of land is unconstrained (from a drainage perspective), providing myriad options for the siting of wastewater treatment systems.

It should be noted that the current Land Capability Assessment considers existing site conditions, thus representing a baseline for design development. Whilst every effort will be made to locate the wastewater treatment systems within land which is 'currently' identified as suitable, constrained land can often be improved via changes in site drainage and ground conditions as a result of development.

3.6.3 Disaster management

Request: The draft EIS and Supplement have not addressed the risks relating to catastrophic events on the wastewater treatment infrastructure. In particular, there is no information about disaster management contingencies for the proposed Integrated Transpiration wastewater treatment plants.

The NT EPA requires an emergency management contingency plan for the Integrated Transpiration system that considers the loss of canopy due to cyclone or fire.

Response: MEDLI (Model for Effluent Disposal Using Land Irrigation) software has been used to undertake the preliminary design of effluent disposal systems for the proposed wastewater treatment plants. As MEDLI does not have the ability to model transpiration within the wastewater treatment cycle, effluent demand on land application methods is based on full system flows with no discount for evapotranspiration. The wastewater treatment and effluent disposal systems therefore have suitable design contingencies, and are sized with adequate storage and irrigation area to account for loss of canopy or poor weather conditions where transpiration may not occur.

The proposed evapotranspiration crops primarily consist of bamboo due to its high water demand, resilience and rapid growth. Bamboo is very resilient to wind and fire damage because the growing points of culms (stems) are below ground, so even if culms are completely severed above ground they will reshoot very quickly and re-grow rapidly. Wind causes minimal damage to bamboo as the plant has high resistance to lateral shear by easily shedding its leaves and due to the high flexibility of the culms. There is a low risk of loss of bamboo due to fire as IT systems have a wide cleared buffer to reduce shading and maximise transpiration, and these buffers provide effective firebreaks. Multiple plant species are proposed in the crops, which is beneficial in the event of catastrophic damage as it is unlikely all species will be destroyed by a single event.

Notwithstanding the above, there are suitable redundancies within the system design to cope with canopy loss through appropriate storage and use of alternative land application methods such as irrigation. Furthermore, Emergency Management Contingency Plans will be developed during future design phases once the specifics of each wastewater treatment plant are known.

Prior to Litchfield Council approving the installation of each wastewater treatment plant, Intrapac will need to have the approval of DENR, Department of Health (DoH) and the NT EPA with respect to wastewater management for the development. This includes obtaining a Wastewater Works Design Approval from DoH, and compiling associated documents (e.g. an Irrigation Management Plan) for irrigation of treated wastewater from centralised treatment systems. It is therefore certain that each wastewater treatment plant will be accompanied by an Emergency Management Contingency Plan.

3.6.4 Wellhead Protection Zones

Request: Intrapac has not satisfactorily addressed comment 98 in the Supplement. As noted in the comment from the Department of Health, further information need to be provided which identify the setbacks from wellhead protection zones.

The NT EPA requires a risk assessment which is consistent with Power and Water Corporation's risk assessment standards for Wellhead Protection Zones and Power and Water's Management Approach for setback distances. The information should identify the setbacks from bores owned by Intrapac as well as existing rural users.

Response: Intrapac acknowledges this request and confirms appropriate Wellhead Protection Zones (WPZ's) will be adopted for the development (in accordance with best industry practice) using thorough, risk-based assessments, including the Power and Water Standards for WPZ's. The locations of proposed wastewater treatment systems are currently indicative and so site-specific WPZ's cannot be determined at this stage. Intrapac will undertake further investigations – including site-specific Land Capability Assessments prescribed within the planning approvals' process – to that ensure adequate WPZ's are nominated to offer acceptable protection to both proposed bores within the development, as well as existing bores operated by neighbouring properties.

3.7 Surface water

Request: The Supplement does not provide sufficient to identify areas currently at risk from flooding both in the project area and immediately downstream. It is not clear how Intrapac will meet its commitment to not exacerbate the flood risk downstream if there is little to no understanding of the areas that currently flood.

The NT EPA requires the results of flood modelling, which identifies areas in and immediately downstream of the site, which are subject to flooding.

Response: Prior to approval of each subdivision, Intrapac will have to demonstrate to the NT Government and Litchfield Council that stormwater drainage is sufficient to deal with the anticipated loads (including flood events).

Intrapac are committed to ensuring the existing flood immunity of downstream environments is not adversely affected by the proposed development. This will be achieved through the integration of onsite detention systems that ensure post-development peak flow rates leaving the site do not exceed pre-development conditions as far as practicable (and in accordance with best industry practice). Undertaking a flood study of existing watercourses and drainage lines downstream of the development site is not necessary to ensure this criterion is met. Preliminary hydrology studies have been undertaken for the development site to understand existing and post-development peak flow rates for a range of design scenarios, up to and including the Major Storm Event (1-in-100 year event). Six detention basins are currently proposed across the development site. During detailed design, further runoff-routing modelling will be undertaken to confirm the outcomes of these preliminary hydrology studies.

Also undertaken have been preliminary hydraulic studies using 2D stormwater modelling to calculate peak water levels associated with the peak flows described above. During detailed design, further modelling will be undertaken to assess the post-development conditions and ensure that all proposed lots meet requirements of the *NT Planning Scheme* in terms of flood immunity and unconstrained land.

3.8 Other

3.8.1 Restricted Works Area

Request: The NT EPA provided comment (comment 316) on the location of the development boundary in relation to the Restricted Works Area in the south east of the site. The Supplement confirmed that the development footprint is not located in the Restricted Works Area and that the boundary of the development would be updated in future.

The conceptual masterplan proposes to construct a stormwater detention basin in the greenspace area, which overlays a Restricted Works Area. Given that detention basins need to be located along drainage lines, it is unclear how Intrapac intends to locate the detention basin without disturbing the Restricted Works Area.

The NT EPA requires further information on whether the detention basin will be located in the greenspace network and how this is consistent with the conditions on the AAPA certificate.

Response: Some stormwater management will have to occur along the drainage line that passes through the Restricted Works Area or else there may be offsite flooding downstream (including of the sacred site). As indicated in Figure 3-6, when finalised the Area Plan and Master Plan will depict a conservation area that is more than adequate for encompassing the Restricted Works Area. Required stormwater management measures will therefore be located in the part of the green space area that does not overlap with the Restricted Works Area.

It is important to note that under the AAPA certificate (and the AAPA legislation) the site is earmarked as *restricted*, with certain conditions, and not a *prohibited works* area. Some site works, including stormwater management, may therefore be appropriate works, subject to negotiation with the relevant custodians and oversight by responsible parties.

3.8.2 Mining titles (onsite)

Request: The Supplement identified that consultation has been undertaken with mining title holders and “the Department of Mines and Energy have applied a ‘no applications allowed’ to the project area to restrict any future mineral title applications”

The Minerals Title Division contacted some of the mining title holders identified in the Supplement and there does not appear to have been any consultation undertaken.

The NT EPA requires Intrapac provide written evidence that the consultation has taken place and outline what was agreed to.

Response: Intrapac have received notification from Holcim (see letter in Appendix B of this document) confirming they will not seek another renewal for the mining tenements they hold that are relevant to Noonamah Ridge, and that they will start the relinquishment process as soon as practical.

3.8.3 Mining titles (adjacent)

Request: Mineral titles occur along the eastern boundary of the Noonamah Ridge site. The proponent has not outlined in its response to comment 330 whether the title holders for these titles have been consulted. As the proponent will be proposing to build residential housing across the entire site it is important that these title holders are included in consultations. The NT EPA requires written evidence of these consultations and outline what was agreed to.

Response: The property to the east of the project site is part of Koolpinyah Station – the same landowner as Noonamah Ridge. There are mineral titles on that property in proximity to the project site, some of which are being actively quarried by Ostoic. Nine of those titles expire by May 2017, three more by the end of December 2018. The longest running lease will expire in 2025.

In discussions with the proponent, Ostoic have stated that they will be leaving the site within the next 5 to 10 years when the projects for which they have been extracting material will come to a close. The Ostoic quarry is nearly three kilometres away from where Stage 1 is proposed, and the next few stages will maintain a similar distance because they will be to the south of Stage 1.

As a consequence:

- 1) The early stages of the Noonamah Ridge development will not be affected by quarrying activities.
- 2) Quarrying activities will be completed long before the eastern side of the project site proximate to the quarry is developed.
- 3) The landowner of the property to the east will not permit the renewal of mineral titles that could impact upon the amenity of the inhabitants of Noonamah Ridge.

4 References

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IUCN (2012), *IUCN Red List Categories and Criteria: Version 3.1. 2nd edition*. Gland, Switzerland and Cambridge, UK.

Westaway J & Cowie I (2012), *Threatened species of the Northern Territory: Typhonium praetermissum*, Northern Territory Department of Land Resource Management,
http://www.lrm.nt.gov.au/data/assets/pdf_file/0018/143163/Typhonium_praetermissum_VU_FINAL.pdf

Woinarski J, Pavey C, Kerrigan R, Cowie I & Ward S (eds) (2007), *Lost from Our Landscape: Threatened Species of the Northern Territory*, Northern Territory Government, Darwin.

Appendix A Revised SEIS commitments

In preparation for being included as a reference document within the *NT Planning Scheme* (as detailed in Section 2.1), the commitments presented in Chapter 9 of the EIS have been revised. Only commitments which are otherwise not accounted for within the planning process are included; those commitments that are expected to be standard conditions associated with the subdivision approvals for this project have been removed.

Social
A community development worker will be employed, charged with introducing new residents to their neighbours and organising social events to encourage interactions and social cohesion from the early stages of moving into the new area.
A 'social infrastructure needs' assessment will accompany each subdivision application. This assessment will consider the broader community needs, as well as the cumulative impact of nearby development.
A stakeholder engagement strategy will be established for the development application and subsequent construction stage.
The effectiveness of the stakeholder engagement strategy will be monitored and assessed at each subdivision stage.
An ongoing social mitigation and monitoring plan will be put in place at development application stage.
Planning
The development will constitute a high quality, master-planned, rural character estate with a range of lot sizes and an emphasis on rural living options.
The minimum lot size for SD properties will be 800 m ² and a maximum of 4,200 residential lots will be developed.
Each subdivision shall be designed in accordance with CPTED principles. This will be specifically addressed in each subdivision application's statement of effect.
A relevant controlling clause will be introduced into the <i>NT Planning Scheme</i> to ensure that, once developed, no further subdivision of individual properties will be permitted.
Lot sizes along Redcliffe Road and to the northern boundary will be complementary to existing lots/homes, creating an interface with existing adjacent landholdings.
Setbacks will be provided to the development's boundaries in accordance with the requirements of the <i>NT Planning Scheme</i> and will be endorsed through the application of building envelopes.
High-level architectural design guidelines will be developed and incorporated into each sale agreement. A covenant will be placed on the title of each property requiring an assessment of building plans against the guidelines, and approval before construction can commence.
The proportion of public green space within the project area will be no less than 15 %.
There will be a rural village within Stage 1 of the development that will reserve land for commercial purposes, a community garden, a public school and sports-fields, a volunteer fire brigade, aged care and a community centre.
The Land Suitability Assessment will be used to guide subdivision design and lot sizing for each stage.
Construction
Contractors will be required to develop, and submit for approval prior to construction commencing, a Construction Environmental Management Plan (CEMP) addressing all potential environmental impacts from the construction phase of the development. The CEMP will incorporate all construction-related management actions from the EMP.
Transport
The <i>Strategic Traffic Model</i> (currently being developed by the Department of Transport) will be used to validate the findings of the <i>Traffic Impact Assessment</i> , as well as to identify other junctions that require assessment.
Road and transport authorities will be collaborated with as the project proceeds to ensure that:

- Staged upgrades and new road developments minimise congestion and ensure accessibility is maintained to the project area and surrounding regions, including access for emergency services.
- Staged upgrades to junctions address potential road safety issues at key intersections.
- Interim park-and-ride facilities within the site become a bus interchange servicing local and regional areas.
- Bus services ensure that final development design allows for 90 % of the dwellings to be within 600 m of a bus stop.

The feasibility of extending bus routes, increasing service frequency and increasing operating hours will be investigated in conjunction with NT Government and private bus operators.

A Traffic Management Plan will be devised for the construction of each stage of the subdivision in consultation with, and submitted for approval to, the relevant authorities.

A pre-development survey of existing road conditions will be undertaken to enable monitoring of construction-related damage to roads.

Electricity and lighting

The use of solar technology to service schools, dwellings, commercial buildings and recreational areas will be investigated.

Sourcing energy from the sewerage system will be investigated.

No overhead streetlights will be used.

Low/ground level street lighting will only be provided in the rural activity centres and on roads where the average lot size is 2000 m² or smaller.

Water supply

Pump testing will be undertaken to inform sustainable yields of groundwater extraction.

Groundwater extraction will be gauged and limited to 20 % of the available resource (based on annual rainfall, advice from DLRM and the results of pump testing).

The viability of the Koolpinyah Aquifer will be investigated as an ongoing water supply for Noonamah Ridge.

In order to ensure that groundwater extraction is within sustainable limits, the number of lots with individual bores will be minimised and means to regulate the amount of water extracted from individual bores will be investigated.

The active recharge of groundwater using excess stormwater will be investigated.

There will be no significant changes to pre-development groundwater quality (as compared to baseline data).

Water quality and quantity monitoring – including creek flow volumes and groundwater levels – will be undertaken in accordance with the Water Management Plan.

Stormwater

There will be no significant changes to pre-development surface water quantity, quality and flows (as compared to baseline data).

Hydrogeological modelling will be undertaken to inform design of the stormwater management systems.

All stormwater infrastructure will be designed and engineered to the 1 % AEP (1 in 100 year event).

Wastewater

Wastewater treatment and land application systems (both individual lots and community-scale systems) will be sited and designed according to relevant standards and guidelines. The systems will accommodate relevant setbacks, buffers and design principles to minimise potential pollution events and impacts on groundwater and surface water resources.

An Irrigation Management Plan will be developed and implemented for each community-scale wastewater treatment plant and associated land application areas.

Conservation-significant values

All land that is identified as having significant conservation values, is contained within an identified environmental buffer area, or is critical to the conservation of threatened species will be rezoned to Conservation, as part of the zoning normalisation process.

Further ecological investigations will be undertaken into Howard River Toadlet post-wet season movements within the 'environmental investigation areas'. The results of this investigation will further determine the extent

of appropriate buffers prior to the development of a final master plan for those stages that could impact upon those areas.
Relevant authorities will be engaged in a workshop to determine the appropriate size of green spaces, the optimum zoning (and, as a consequence, responsibility management), the degree of public accessibility to key areas, management of key areas (including fire and weed management), monitoring programs (and responsibility for undertaking these), and how to promote within the community an understanding and appreciation of the values 'on their doorstep'. <i>This commitment will be incorporated with the requirement that management arrangements are resolved before the commencement of Stage 3.</i>
For occurrences of <i>Typhonium praetermissum</i> that are not contained within conservation reserves, individuals will be translocated into reserves that contain members of the same subpopulation. This will occur prior to each stage being developed. The procedure and timing for translocation will be developed in consultation with the NT Herbarium and DENR.
Landowners will be encouraged – through the combined use of building envelopes and land-clearing permit requirements – to retain as much natural vegetation as possible on their lots.
The CEMP for each stage will contain a Vegetation Clearing Management Procedure (including a Wildlife Rescue Procedure) and a site-specific Weed Management Plan.
Cultural heritage
All artefacts of low and medium cultural heritage significance will be collected, labelled, grouped and buried in a 'keeping place' in consultation with the responsible authorities.
Sites of high cultural heritage significance will be buffered within reserves within conservation reserves.
Maintenance and management of cultural heritage reserves will be undertaken to retain the fabric and condition of objects and sites.
Listing the aircraft wreck on the NT Heritage Register will be investigated.
The Restricted Works Area in the south-east of the project area will be buffered within the green space network.
Bushfire
Development design will include allocation of emergency evacuation routes.
Lot layout will avoid creating unmanaged interfaces between rural and high density areas that may become a fire hazard.
Agreements will be entered into for any land not designated for housing or commercial purposes (e.g. parks, drainage buffers and heritage zones) to allocate fire management responsibilities.
A Permit to Burn will be obtained for any controlled burning.
Signage will be installed within all bushland green spaces to inform residents about fire impacts on threatened species.
Biting insect
Drainage will be rectified – to the satisfaction of the responsible authority – in all onsite mosquito-breeding areas within 1.6 km of the village centres.
Clauses will be placed in contracts of sale – and included as covenants on titles – to inform residents of potential mosquito nuisances.
Dwellings located within an identified buffer from a potential mosquito breeding area will be subject to architectural guidelines requiring the installation of appropriate mosquito screening on all external doors and windows, as well as recommendations to screen outdoor entertainment areas.
Stormwater drainage and lakes will be planned, installed and maintained to avoid creating mosquito-breeding habitat.
The CEMP for each stage will include drainage work, housekeeping, inductions and management actions to minimise construction workers exposure to mosquito-borne diseases.
The community-scale treated effluent irrigation areas will be planned, installed and maintained to avoid creating mosquito-breeding habitat.
Noise and air quality

The CEMP for each stage will outline specific management actions to minimise noise impacts from construction activities.

The CEMP for each stage will outline specific management actions to minimise air impacts from construction activities.

Other

A Domestic Waste Management Plan will be prepared for the development and will include timeframes for Litchfield Council to undertake waste removal and relevant stakeholders.

Intrapac will work with the responsible authorities to ensure that the collection and removal of household waste can be accommodated.

A public building within Village One will be constructed to the required standards to constitute a cyclone shelter.

An extension of the 'emergency response area' for the NT Fire and Rescue Service will be sought to include within in it the project area.

Appendix B Letter from Holcim re mining tenements

Intrapac Property Pty Ltd

Level 6
580 St Kilda Road
Melbourne VIC 3004

Attention: Paul Nicholls

February 03, 2017

cyril.giraud@lafargeholcim.com

Dear Paul,

RE: Holcim (Australia) Pty Ltd - Noonamah Leases

Holcim (Australia) Pty Ltd ('Holcim') holds 8 mining tenements located in the Noonamah area:

- MLN387
- MLN388
- MLN389
- MLN392
- MLN393
- MLN394
- MLN396
- MLN397

These tenements were renewed on 18/09/2000 and expire on 31/12/2018.

Following your request for information, I can confirm that Holcim will not seek another renewal for the above tenements and will start the relinquishment process as soon as practical.

Yours sincerely,



Cyril Giraud

National Approvals and Sustainable Development Manager

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